



Dr Paul Gibson-Roy

Lead Scientist, Greening Australia (NSW)

Paul's Piece

Greetings to our 2017 edition dear Gazette readers. It's now over a decade since we began producing this newsletter. Initially our aim was to keep those far-flung GGRP farmers, seed growers and volunteers connected and informed on how the project was progressing. But for many years now we've expanded the topics the Gazette covers to include stories and experiences from others active in grassy restoration be they within Greening Australia or associated with other groups and organisations.

At the end of 2017 we are as committed as we were in 2006 to promoting the work being done to conserve and restore grasslands and grassy woodlands. The stories we present in this edition demonstrate that despite the ongoing constraints that restrict the support for restoration being as pervasive as ever, there are nevertheless remarkable people out there still committed and doing what they can, with whatever resources and support are available, and more amazingly that impressive outcomes are being achieved!

I'm so impressed and encouraged by the many 'threads' that seem to be coming together to weave an increasingly complex tapestry of action which see our wonderful native herbaceous flora used creatively in rural and urban environments, through seed production innovations, in social, cultural and even bush food programs. I hope you enjoy this edition as much as we've had compiling it and that it serves once again as a celebration of the amazing work and passion displayed by those dedicated to this cause.

Merry Christmas and best wishes for the coming year. Let's hope it's the year grassy restoration finally gets the support it deserves!



Rod White and Paul Gibson-Roy surveying the volcanic plains grasslands.

GGRP Sites Nearly 15 Year On

In 2003 I began to plan for, and in 2004 I was fortunate to be able to oversee the implementation of Greening Australia's Grassy Groundcover Research Project (GGRP) (if I only had known what I was letting myself in for!). A critical goal of the GGRP was to establish a restoration-focussed experimental study under 'real world' conditions. In part this goal stemmed from a comment made to me by a senior Department of Environment official who'd attended a field day I'd run at the completion of my PhD. Here, while standing in front of my 50-odd two by two metre direct seeded plots (and alongside many others from the sector) he loudly proclaimed 'this all looks interesting but you need to show us it can be done at-scale in the real world on farms'.



A high-quality restoration near Wickliffe with sown native diversity and many colonising natives. This site had been scalped pre-seeding and is under a regular CFA biomass reduction burn program.

The rest of the GGRP story most Grassy Gazette readers will know, as we've reported all the highs and lows over many years. Outcomes of the project have also been published in various journals and even a book (Land of Sweeping Plains). From the earliest days after sowing our first plots we began to get a sense of just how important to success were several individual (but linked) factors. Success to us was essentially the creation of complex, functional and resilient grassy vegetation (where there had been none).

Distilled to their basics, these factors could be summarised as:

1. Access to quality seed in sufficient quantities and diversity for direct seeding (i.e. via cultivated seed production areas (SPAs) and in good seasons, field stands);
2. The need for suitably prepared (friable) seed beds and seed delivery technologies (mechanised ground preparation and seeders);
3. Having the capacity to manage inappropriate soil nutrient and weed seed loads (we used scalping);
4. Having the ongoing capacity (and intent) post-establishment to manage excess biomass (native or exotic) in the restored vegetation (e.g. fire, grazing, cut and bale, chemicals, combinations-of);
5. Having ongoing capacity (and intent) to implement whatever additional restoration or management actions may be necessary over time (micro or macro) to further influence the vegetation trajectory (e.g. increase native diversity).

The last formal monitoring of the many GGRP restorations occurred in 2011 (enabled through generous support from the then Victorian Department of Environment). Again, these surveys revealed how important these 5 factors are.

Over the years those involved with the GGRP have given many presentations across Victoria and well beyond. We have articulated just what can be achieved when these factors are met (and what is achieved when they are not!). What often happens following the showing of an

image of a wonderfully diverse restored grassland (or grassy woodland) is that someone in audience has the courage to comment something to the effect "yes that might look good now.... but will they actually last?". This type of comment dates from our earliest days through to the current. It is of course a valid question and concern. For my part I've always answered in this type of manner 'we must continue to observe and monitor'. Beyond that, I have always felt that ongoing 'success' (quality, resilience, structure) will be most influenced by factors 1, 3, 4 and 5.

To this end I was finally able to create the opportunity to return to Victoria in October of this year and spend some weeks re-surveying all our far-flung GGRP sites (from Gippsland to the Wimmera!). It will probably take me another year to compile and analyse these data, but I'm prepared to give a few 'here's what I reckon I was seeing' comments.

1. The various combined influences of these factors (1 – 5) seem to have been responsible for creating the current state and structure of these restored grasslands in 2017, which ranged in 'quality' from poor to utterly astoundingly good (I will give no points for guessing which combinations gave what outcomes).
2. In the restorations where nutrients (and weed banks) were successfully managed, high native diversity, open gaps, stable sub-dominant structure, increasing native population numbers and colonisation from non-seeded natives was the norm (in many cases this meant increasing numbers for nationally threatened species, or their recovery from bud-banks or colonisation from seed).
3. In restorations that displayed the features highlighted in the previous point, faunal diversity and complexity seemed, from visual observation, to be very high. For example, tiles had been laid many years ago in several restorations and under all I found an abundance of fauna including invertebrates, amphibians, reptiles and vertebrates. There were also ample examples of other faunal activity in the broader vegetation across all high-quality restorations.



Banded Whip Snake at a restoration in the Chepstowe region.

4. In restorations where nutrients (and weed banks) had not been successfully managed (i.e. herbicide-based site preparation only) native diversity was low, gaps were limited or absent, vegetation was stable but dominated by exotic grasses (on some rare occasions co-dominated with native grasses), native forbs were few or absent and there was little or no colonisation from non-seeded native species.



A low-quality restoration near Donald totally dominated by exotic grasses. This site was treated with herbicides for 3 years pre-seeding and has had no active biomass reducing management post-establishment. Note: an adjoining scalped restoration has a very different composition and structure.

5. Regardless of the set-up conditions (scalping or herbicide), if no management of biomass had been undertaken post establishment (or not undertaken on an ongoing basis) plant diversity was lower, gaps were rare and vegetation structure tended to dominance by grasses (exotic or native).
6. In restorations that had been scalped there was visual evidence of where the technique had been effective but inconsistent in its implementation leaving sometimes very small, sometimes quite large areas, where weeds persisted in otherwise high-quality vegetation. Such zones, where unmanaged, had remained stable in those states for many years, neither spreading into the high-quality areas, nor

being colonised by the adjoining natives. These situations highlight the need (I would say crucial requirement) for on-going management action. This might include undertaking micro-scale scalping to re-direct the zone to a desired state (which might simply then occur through colonisation from surrounding seed sources, or by sowing with seed harvested from that or other sites).

7. Bad things still happen to grasslands - remnant or restored. On my travels I passed by a wonderful grassland remnant on a three-chain road that had been cultivated by a local landholder not more than an hour before I stopped. I would guess to sow that area to a crop. Why does this type of thing still occur? But wait there's more. On another day I drove up to one of our restorations established on a council site adjoining a small rural cemetery, only to find it had at some point since 2011 been sprayed out, capped with imported soil and sown down with turf grass (with a gravel road laid through the middle). That restoration had supported at least 0.4 ha of high quality native grassy vegetation including populations of at least 2 nationally threatened species. Again, I'd ask, how is it possible that this sort of thing is happening?

I'll wrap all this up by commenting that a few weeks after I'd done this monitoring I was asked to be a speaker at a grassland forum held on the Victoria Volcanic Plain (VVP). While I enjoyed the opportunity to present and catch up with many old friends I was left somewhat despondent from a day where I felt yet another group of lovely and well-intentioned people gathered to talk about what grasslands should look like and bemoan how they continue to disappear. Yes, the tragedy is that this is true - despite all our efforts over so many decades. But what I found more disappointing was that despite there now being many, many examples of high quality restored grassy vegetation dotted right across Victoria and beyond (some undertaken by the GGRP but encouragingly, also now by other organisations), there still seemed to be no "light bulb" moment for those I spoke to on that day, or indeed at other similar presentations I've given in past years.

Surely, with the evidence now before us, restoration must be embraced and undertaken with haste in this country. If not, the thing we all say we want retained will disappear. It's frankly that simple. Restoration can halt the loss of these native grassy communities. The work I've spoken of shows that to be the case at small scale here in Australia. For those who remember my comments from last year's Gazette, the Americans have shown us how it can be achieved at astounding scales. Please let's stop watching grasslands and grassy woodlands disappear and take up the challenge to put them back. We finally have the tools to do so. Now we must find the will.



Indigenous Students from Erindale College planting bushtucker garden.



Primary School children learning about the cultural significance of local plants.

Adam Shipp

Indigenous Engagement and Training Officer (ACT)

Bush Tucker Garden Program

Hi. I'm Adam Shipp and my primary role with Greening Australia Canberra is as its Indigenous engagement and training officer. In this role I work with many schools and community groups coordinating and creating showcase native gardens that celebrate local traditional Aboriginal food and medicine plants of the region.

A project that myself and colleagues from the Capital Region have had significant input into was the development of the Ngunawal Plant Use Guide. I'm pleased to report that this publication is now utilised by local schools who engage with students to learn about the traditions of Aboriginal culture in their curriculum.

Another outcome from the publication of the Ngunawal Plant Use Guide is that proceeds raised have enabled GA

to donate 30 native plants to each school and community group involved in the Bush Tucker Program to plant in their gardens. I also go to each school to speak with the children about the cultural significance of these plants and to help them to plant and establish their gardens.

Currently, the school visits are conducted on a fee-for-service arrangement, however GA is working with these groups to find independent funding so that this service can be provided free in the future.

To-date, GA has worked with over 50 schools and community groups in the A.C.T and the surrounding region on its Bush Tucker Program. Together we have created important educational resources that are wonderfully represented by these showcase native wildflower gardens.



Children keen to get amongst the bushtucker plantings.



Stand of Blue Pincushion's - *Brunonia australis*

John Delpratt

Honorary Fellow, University of Melbourne

Finding the White Brunonia

I'd heard they were out there – the white Brunonia! Blue Pincushion (*Brunonia australis*, Goodeniaceae) has long been one of my favourite plants. But I'd never seen a white one.

Twenty odd years ago, a student had told me she had seen white Brunonia on her rural property in north-east Victoria. So, every time I approached those beautiful flowering carpets of reliable and uniform blue, I retained that half-formed hope; 'maybe this time'. (In fact, at peak flowering, a patch of Blue Pincushion usually displays a colour range from a purple-blue through to a soft, powder-blue – but I think this is simply differing ages of the florets, rather than true variation in flower colour).

When it finally happened, it was almost as though I was expecting it. David Franklin and I were doing a quick 'reci' of a very fine grassland remnant beside the Woorndoo-Streatham Road at Woorndoo. We were preparing for the launch of The Woorndoo Project the following day (see 'Building on grassland success – The Woorndoo Project', this edition).

There they were, standing proudly at the edge of a small patch of their blue kin - and they were clearly and unmistakably WHITE. Four stems (presumably one plant), all a little past their prime but fascinating none-the-less (and did I mention they were WHITE). While we are on the subject – there is a pure white Blushing Bindweed (*Convolvulus angustissimus*: Convolvulaceae) in the Evans St Wildflower Grassland at Sunbury, north-west of Melbourne. The flowers of this species are almost invariably a shade of pink, although Flora of Victoria online, <https://vicflora.rbg.vic.gov.au/> does mention the rare white form.

There is no end of fun to be had out there in the grasslands.



The spectacular WHITE pincushions

Chris Finlay

Director, Flora Victoria

Direct Seeding Native Grass, a Commercial Perspective

Paul Gibson-Roy and I first met in 1999 when I was working in the gardens at Burnley Horticultural College, and Paul was an Honours student about to embark on what would become the Grassy Groundcover Research Project. This was also the year that our company Flora Victoria was established, and since then Paul and I have been on very different paths to a similar destination. My path has taken the commercial route through the environmental contracting industry in the Melbourne region. Now, nearly 20 years after Paul and I met, Flora Victoria has developed significant seed production capacity (and seeding experience) to become one of the major suppliers of native grass seed in Australia. This may not seem a huge feat compared to the scale of similar enterprises in North America, but it is notable given how risky such a venture is in our fledgling Australian market.

Page 6: Broad vista of our grass production facility located near Tullamarine.



While Paul has focused on the science that has given credibility and hope for the future of direct seeding in this country, Flora Victoria has been looking for ways of selling the concept to create opportunities for using native grasses and to keep our business alive. This has meant finding various applications for native grass seeding, not only for revegetation and ecological restoration, but anywhere else they would be beneficial. In the commercial world of seeding native grasses, it quickly becomes apparent that there is not a lot of money available for seed production or seeding services from the environmental sector. However, the story is a bit more positive when it comes to seeding work within commercial and residential developments, and/or for protecting and enhancing civil infrastructure. Here are 3 examples.

Native Grasses can be used as alternatives to exotic turf under low rainfall conditions (which are typical in our region). Under these scenarios areas such as public open spaces (like parks) can quickly become summer dust bowls. Although native grasses tend to brown off in drought conditions, being perennial, they will still protect the soil surface from wind erosion and green up again when conditions are suitable. We sowed 4.5 hectares in 2013 with mixed Wallaby Grass (*Rytidosperma* spp.) in a new park in a low rainfall suburb of Melbourne and the grass is still going well 4 years later.



Mix of native grasses within a low rainfall suburb.

Landscaping and maintaining bridge batter vegetation has been a problem in several locations around Melbourne for road agencies and councils. These bridge (or road) batters are often very steep, and it can be expensive to establish vegetation and even more-so to keep it looking good.

A solution is to install native grasses on batters which have been routinely sprayed-out for several years' (to control weeds) making them ideal for establishing more robust native grasses. To this end we have sown many batters over the last ten years turning them from patchy and often weed dominated landscapes into landscape features.



Landscaping bridge batter with native grasses.

Infrastructure projects like pipelines and soil bunds need to be vegetated as quickly as possible post-construction to lock-down soils and prevent erosion, and native grass can often provide an effective solution. The following photo shows a 3-hectare reservoir bund Flora Victoria seeded with native grasses which now look attract, have stabilised the soil surface and controlled erosion.



3-hectare reservoir bund sown with Wallaby Grass

Like Paul (and Greening Australia), Flora Victoria's main goal is to increase the extent of endangered grassland and grassy woodlands. However, there are many other applications where native grasses can also be used, such as in civil applications where it is both beautiful and practical. As the seed industry develops I hope direct seeding native grasses gains the popularity it deserves, and becomes the main form of revegetation and ecological restoration. Until then we will be looking for other ways to make our seed production of native grasses an economically viable part of Flora Victoria.



Paul Gibson–Roy

Lead Scientist, Greening Australia (NSW)

National Native Seed Sector Survey

Over four months from late 2016 to early 2017 the Australian Network for Plant Conservation (with support from the Rural Industries and Research Development Corporation and Greening Australia) ran an online Native Seed Sector survey to capture a snap shot of the current state of the sector and to gauge respondents' attitudes and opinions on many issues.

There was an extremely encouraging response to the survey with over 40% from those contacted across all states and territories taking part. Respondents took the time to consider many detailed questions and to also make candid comments. The survey responses were augmented by a Native Seed Workshop run in conjunction with the ANPCs 2016 National Conference (held in Melbourne). Feedback from the workshop delegates also provided valuable insights and opinions about the seed sector.

The summary survey report (compiled by Nola Handcock, Martin Driver, Linda Broadhurst and myself) is now in its final stages of preparation and due for release in the early part of 2018. We hope it will not only give a clear insight into the state, workings, issues and concerns of our native seed sector, it will hopefully also form a base of information that allows those within the sector to articulate and lobby more effectively for greater support. There was overwhelming sentiment from the survey and workshop for the need to grow this sector and to create improved conditions for those whom derive their livelihood from it. This can only really occur if there is an increase in the size of restoration markets that lead to greater seed demand. This would help the sector build capacity and innovate so it can meet the challenge of supplying the huge quantities of native seed required to meet the biodiversity crisis our nation faces. Please keep an eye out on the ANPCs web site for more news on release timelines.

The 1.25 ha, 2013 Woorndoo restoration in spring 2017.

The site was burnt in autumn 2017, revealing many thousands of well-established forbs as the community re-grew. Native grass and forb seed harvested from this site will be used to sow an additional 1.25 ha in 2019. The sowing mix will be diversified with seed from a diverse range of local species collected from nearby remnants and grown in seed production areas.

Photo: John Delpratt.

John Delpratt

Honorary Fellow, University of Melbourne

Building on grassland success – The Woorndoo Project

In 2013, the Woorndoo Land Protection Group (WLPG), together with David Franklin*, completed a 1.25 ha grassland restoration on the Woorndoo-Streatham Rd at Woorndoo, in south-western Victoria. The Woorndoo/Chatsworth area boasts many beautiful and high-quality roadside remnants but, as with all such remnants, they are vulnerable to incremental loss from a broad suite of threats.

The restoration has been a stunning success and earlier this year it became the basis for a successful application to the Victorian State Government's Biodiversity On-ground Action – Community & Volunteer Action Grant scheme

(<http://www.environment.vic.gov.au/biodiversity/biodiversity-on-ground-action>). The new project is funded for two years. In 2018, the plan is to establish a suite of experiments designed to enhance and diversify the initial restoration, while the project gathers and produces additional seed stocks. In 2019, the experiments will continue into their second year and a further 1.25 ha will be sown and planted with a diverse mix of local native grasses and forbs. A compelling element of the grant application was that WLPG was able to contribute several thousands of dollars-worth of 'in kind' seed already harvested from the 2013 restoration.

The project has a strong emphasis on attracting community involvement and volunteers, both from the Woorndoo/Chatsworth area and from the wider network of people with an interest in native grasslands and their long-term future. With activities such as field seed collection, seedling propagation and production, seed production from cultivated crops, planting, sowing and monitoring experiments and general nursery operations, there is plenty of scope for volunteers of all levels of grassland knowledge and experience.

The project was launched with a Community Day at Woorndoo in mid-November. I introduced the project to 35 or so attendees. Neil Marriott delivered an authoritative and entertaining presentation on grassland communities, their key species and the threats posed by various introduced species. Jess Gardner followed with a brief history of the Grassy Groundcover Research Project and the significant and continuing contributions made by volunteers since its inception. Stirring stuff!



Attendees at The Woorndoo Project Community Day explore the floral abundance and diversity on the Woorndoo common. Photo: Liz Fenton.

The attendees were invited to explore the adjacent Woorndoo Common, an iconic site for all of us dedicated to the conservation and expansion of natural temperate grasslands on the Victorian Volcanic Plain and beyond. After a pleasant and convivial lunch, we spent an inspiring and productive hour or so viewing the 2013 restoration and an adjacent, richly diverse roadside remnant (see Finding the white Brunonia, this issue).

The next order of business for the project is seed collection during the summer and autumn (under permits issued to myself and David Franklin), the production of tube stock for experimental plantings in autumn and spring and the establishment of a seed production area (SPA) for the multiplication of seeds of diverse species for the 2019, large-scale sowing, which will double the size of this restored roadside grassland.



A detail from the Woorndoo restoration in spring 2017 showing a mix of native grasses (predominantly Wallaby Grasses and Kangaroo Grass), daisies (Hoary Sunray; Lemon Beauty-heads; Scaly buttons; Common Everlasting) and a well-developed moss mat community



The new sowing planned for 2019 will double the area of restored diverse native grassland and extend into roadside currently used for cropping. The project has the support of the Moyne Shire, the managers of this road. Photo: John Delpratt

Information on the project will be reported in Grassy Gazette from time to time. If you would like to visit the site, it is on the northern side of the Woorndoo-Streatham Rd at the intersection with Bolac Plains Rd., approximately 20 minutes by road south of Lake Bolac. The high-quality remnant, which will act as a template for the on-going restoration, is immediately adjacent.

If you would like to know more about volunteering for the project, please contact John Delpratt (ceciljd@unimelb.edu.au) or David Franklin (davidfranklin@grasslandflora.com.au).

* Learn more about David Franklin from these excellent blogs -
<https://thebushlander.wordpress.com/2016/03/05/intervie-w-with-david-franklin-part-1/>
<https://thebushlander.wordpress.com/2016/04/10/intervie-w-with-david-franklin-part-2/>

Candice Parker

Geelong Project Officer,
Greening Australia (VIC)

Victorian Volcanic Plain 3 Day Grassland Event

For the second year running Greening Australia ran a 3-day grassland event, funded through the National Landcare Program (in partnership with the Corangamite CMA).

Each day was a great success, all selling out, with 150 participants attending across the 3-days. Participants had a wonderful line-up of presenters. Day -1 featured Dr John Morgan (LaTrobe University) and Dr Paul Gibson-Roy (Greening Australia) who looked at floristic make-up of the Volcanic Plains Grassland and the successes of current restoration techniques. The field visits enabled participants to get up close to some great examples of VVP grasslands. Here they had the chance to improve their identification skills or to simply wander and take in the spectacular wildflower colour displays.



Field day participants out exploring the Volcanic Plains Grasslands.

Day-2 saw Damien Cook (Rakali Consulting) and Michelle Casanova (Federation University) providing a wealth of knowledge in all things about grassy wetlands. Participants visited and experienced gilgi wetlands, as well as a lovely wetland on private property in Birregurra where swamp daisies (*Allittia cardiocarpa*) flowered en masse.



Damien Cook identifying wetland plant species for participants.

A beautiful view atop Red Rock, a perfect way to start Day 3.

On day-3 the forum focussed on the fascinating subjects of VVP volcanic geology and Aboriginal heritage. Presenter Dr Julie Boyce (Melbourne University) spoke on land formation of the region, highlighting the many different types of volcanoes present in this landscape. Matthew Phelan from Aboriginal Victoria then discussed Aboriginal history, showcasing different types of artefacts as well as reviewing the current legislation in place to protect these important items and culturally significant sites. These presentations were followed by a field trip to Dreeite, featuring its unique stony-rise formations where John Clarke (from Eastern Marr) captivated the audience with his knowledge and passion of these landscapes.

Each of the 3-days was enthusiastically received by participants and we look forward to providing another similar event next year.



Participants engaged with John Clarke from Eastern Marr





The first part of restoring diversity within the grassland demonstration site. The area was scalped due to the high weed load and high nutrient level as assessed through soil analysis.

Inverleigh Grassy Restoration Demonstration Site Report

Through a collaboration with the Corangamite CMA in 2016 Greening Australia undertook a grassland restoration program at a property in Inverleigh. The farm itself had traditionally been grazed and the aim of the program was to implement different restoration techniques within different farm zones. Each zone was based on the characteristics of weed density and native vegetation cover.

Our monitoring this year revealed that actions initiated in 2016 (when rabbit proof fencing was installed) have had some great results with flora not previously surveyed now apparent at the site. These species included both sun and golden sun moth orchids.



Golden Sun Moth (*Diuris chryseopsis*).

Management techniques implemented this season have included 'herbicide spray topping' in areas where annual weed cover was quite dense and targeted spot spraying of broadleaf weeds. An additional area surrounding a single Red Gum that was heavily infested with exotic weeds was also graded to remove weed laden topsoil and excessive nutrients. This cleared surface was then direct sown with a wildflower rich seed mix. We are keenly awaiting the results of this action.

Additional funding support through the National Landcare Programme has also allowed us to engage with Gordon Tafe students. These students have been critical to learning about how the site has progressed by conducting flora and fauna surveys that included remote camera set-ups and footprint ink traps. We were encouraged to find the camera's capturing kangaroos and possums, along with several bird species (and a fox with her cubs!). In general, however, fauna proved quite difficult to spot in surveys. This may be partly due to a lack of habitat resources available in the area such as old logs, rocks, and varied floristic structure. This potential lack of faunal habit is something that we will have to continue to investigate. We will also continue to explore the potential there is to restore these elements into the grassland. For their part the Gordon Tafe students have also used the site to gain valuable additional experience in the restoration sector. They have increased their knowledge of native and weed species identification and hopefully have a better understanding of weed control methods (i.e. mechanical and chemical control).



Gordon Tafe students undertaking a fauna survey with assistance from Trevor Pescott (Geelong Field Naturalists Club).

Geelong Botanic Garden Seed Production Program: Season 2 Update

In the past we've highlighted the Seed Production collaboration between GA Corangamite CMA and the Geelong Botanic Garden (GBG). In the past year the SPA has been revamped with additional species added to the mix. This has been an exciting development with the new arrivals including Blue Devils (*Eryngium ovatum*), Featherheads (*Ptilotus macrocephalus*), Chocolate Lilies (*Arthropodium strictum*) and even the nationally threatened Button Wrinklewort (*Rutidosia leptorhynchiodes*). Over the past year GBG staff and passionate Greening Australia volunteers have provided wonderful assistance to grow the thousands of plants required to initiate these new production crops at the site. An extra bonus from the works has been that any plants grown in excess of SPA requirements have been planted within the Botanic Gardens creating a lovely effect. If you are in the area please drop by to look around!



Replenishing the Seed Production Area, Geelong Botanic Gardens staff lending a hand with the plantings.

We have also found the SPA has proved to be a great tool for engaging with the local community and visiting school groups. Seeing these lovely native ground layer species growing in cultivation helps visitors to gain a greater understanding of the variety of plant types our beautiful native wildflowers represent. Hopefully, it has also given them an appreciation of how critical it is that we preserve our precious remaining VVP grasslands.

There are two other threatened species in the SPA. These are the Salt-lake Tussock-grass (*Poa sallacustris*) and Spiny Peppergrass (*Lepidium aschersonii*), each of which is quite inconspicuous and occupies different zones around the volcanic lakes of the Western District. Indeed, there is little formal information recorded on either species. Support to bring these two species into cultivation was provided through a State Funded Community Volunteers Action Grant. The aim has been to promote knowledge and increase identification skills for both species as well as creating the opportunity to produce their seed in quantities suitable for use in restoration projects. Indeed, some of the seed harvested thus far has enabled the propagation of over 2000 tubestock which has since been planted into landscapes in the Lake Beac area. We feel the work we've done with these species has helped raise their profile. This is quite an important outcome because they are both quite easy to 'miss' when walking around the volcanic lakes!



Salt-lake Tussock-grass (*Poa sallacustris*) plot within the SPA.

Kieran Kinney
Project Officer (NSW)

Sharing the Knowledge and Fun at Sydney's SPA

Here at Greening Australia's western Sydney SPA we work hard to produce the seed which is then used to create resilient and functional grassy ecosystems. At times it feels like reaching this outcome is all just sheer hard work but we do try to couple on-ground actions with careful research, planning and discovery. Another 'string to our bow' is that we try to 'spread the word' as much as possible to educate and provide knowledge of these techniques to the public.

As part of this commitment we quite regularly host groups at our SPA facility of young people enrolled in the Green Army program. In this way they can get some hands-on experience about what is done in a Seed Production facility. Along the way they also learn things about native plants, such as what they look like, how they grow, how to harvest their seed, and how they are maintained. These are things most people would be hard pressed to pick up in our degraded native landscapes. These Green Army visitors also get a sense of what it might be like to work in the environment sector. Indeed, some have gone on to become GA employees and valued team members.



The Green Army Team getting some industry experience planting in the seed production area.

The wonderful Teagan Hartenthaler is an example. Teagan holds a Masters of Environmental Science and is passionate about the natural world. When I quizzed her about her Green Army experience she commented "my favourite activity was working in the SPA and learning about the species we just weren't seeing in the field....seeing when they flower, identifying ripe seed....working directly with the plants themselves."



Green Army participant now Greening Australia team member Teagan Hartenthaler.

Since joining us as a team member Teagan has become exceptionally proficient at a wide range of tasks as varied as seed and plant propagation, seed harvest and seed testing. On this she commented "at the moment I am doing lots of seed purity and germination testing. This has been really intriguing, looking in fine detail at the structure of all these different types of seed. From this we hope to gauge if they are filled and hopefully viable (or not). To do this we use microscopes...Every day I feel like I'm learning something new!" Teagan is now working to develop a photographic library of all the seed we grow which is something all of us are tremendously excited about.

I think our experience with the Green Army visitors has been overwhelmingly positive. I've gained a great deal of pleasure watching their learning and interest progress, and seeing their eyes light up when someone encounters something new and exciting for the first time. I look forward to working in this way with others at the SPA as I feel it's an essential part of our project.



Mt Bold SPA Yellow Beauty-heads (*Calocpehalus citreus*) and Kangaroo Grass (*Themeda triandra*).

Shaun Kennedy
Specialist – Vegetation Services
South Australia Water

SA Water's Millbrook Grassy Woodland Revegetation Project

South Australia Water aims to reconstruct a Grassy Woodland at Millbrook Reservoir in the Adelaide Hills to create a Native Vegetation Offset. The 21ha site has several physical attributes that provide an excellent opportunity to implement goal-based restoration of grassy woodland vegetation types that are now rare in the region's reserve system.

Overcoming woody weeds

The site was used for Radiata Pine forestry since 1932. In the summer of 2011/12 it was clear-fell harvested. Not long after pine removal invasive woody weeds (Gorse and Broom) began to emerge in huge numbers from the seed soil bank. These threatened to blanket the site and de-rail hopes of a return to healthy woodland ecosystem. In January 2015 a major bushfire burnt a large portion of the Millbrook area destroying all this standing weedy vegetation but triggering a further mass-emergence from the seed bank. However, persistent follow-up weed control by SA Water's contractors over two years has successfully removed this re-emergent weedy cohort paving the way for revegetation to begin in earnest.

Diverse native grass ground-layer

A key aspect of the intensive revegetation work being undertaken within the site is the establishment of 3.1 hectares of native grass meadow to provide the basis for an open woodland habitat. Native grass meadows represent a crucial component of the restoration design and provide the following benefits:

- Open-structured habitat features in a low-maintenance format;
- Competitive weed exclusion by native grasses and the localised establishment of understorey forb species;
- Facilitation of future dispersal of groundcovers throughout and beyond the area seeded (after annual weed cover is suppressed by the colonising shrub canopy).

This is the third large-scale project where SA Water has incorporated establishment techniques like those developed by the Grassy Groundcover Project. As with our past efforts, the design process began with identification of reference native vegetation types, then surveys to locate reference sites, followed by seed collection to assemble component species. Next, we undertook analysis of soil cores taken from across the restoration site (at various depths in the profile) to compare soil nutrient status and weed seed load with reference sites. While this work indicated there were no significant fertiliser residues to contend with we found there was a significant annual weed seed load in the top 50 millimetres of the restoration soil profile. This was dominated by competitive weeds - notably Salvation Jane (*Echium plantagineum*), Wild Oat (*Avena sp.*) and perennial Sweet Vernal Grass (*Anthoxanthum odoratum*). Thankfully there was a negligible abundance of woody weed seeds.

¹ Gibson-Roy, P., Moore, G. Delpratt, and Gardner, J. (2010). Expanding horizons for herbaceous ecosystem restoration: the Grassy Groundcover Restoration Project. *Ecological Management & Restoration*. Vol 11 Issue 3 December



The planting crew setting up a node.

In response to this information we elected to implement a topsoil scrape in discrete areas to remove weed seed loads in preparation for native grass seeding following a similar rationale outlined by the GGRP (Gibson Roy *et al.*). Site constraints such as residual pine stumps and an undulating terrain dictated that native grass elements needed to be configured mainly into linear contour alleys. It was thought that these alleys would also serve as maintenance access tracks in future years (once grass cover was sufficiently established to tolerate occasional vehicle traffic). Other parts of the restoration site that were prepared in a similar way included fire-track verges, swards on flat hilltops, damp ground surrounding eight old well features and micro-scrapes in 'Bog Zones' (all of which were trimmed out and prepared by a team of skilled earthmoving operators).

In May 2017, the 3.1 ha scraped zone was cultivated and seeded with 11 native grass species at a rate of three grams floret seed/m² using an Aerovator with a custom seed box. Seeding required 93 kilograms of native grass seed which was not locally available as a field sourced retail purchase. Instead, a carefully planned seed production program was initiated beginning with wild collections in 2014, nursery propagation and planting crop beds in 2015, and seed harvest in the summer 2016/17.

In August 2017, a series of 'groundcover nodes' were insert-planted (using tube-stock) into the native grass contour alleys to establish colonies of 36 species containing important forbs and harder-to-grow shrub species). Previous plantings of tube-stock forbs aiming to increase site diversity have generally had limited success or required significant after-care to ensure establishment. This time we are hopeful that planting forbs within cleared zones in a native grass matrix will be more successful (i.e. the native grasses will provide competitive exclusion of wind-dispersed weeds and nurse-crop conditions for established forbs to disperse through).



Below and Right: Seed Production program wildflower containers.



Meanwhile, in adjoining compartments, traditional machine direct seeding and tube-stock planting of shrubs and small trees was undertaken with the goal to create a situation where that vegetation shades out the existing exotic pasture over the coming decade. This we hope would open the site enough for the dispersal of native grasses and forbs.

Bog Scrapes

Spring-fed seeps dotted throughout the site have also provided an opportunity to trial the establishment of 20 rare species (forbs, grasses and sedges) associated with seasonally inundated red gum flats. This ex-situ conservation effort is in partnership with the Scientific Officers from Adelaide Botanic Gardens. Our prior experience with these interesting plants has been encouraging and it seems their rarity is less about requiring ‘fussy niches’ and more about their preference for habitat that has since been degraded by historic land use change (i.e. they make good dairy farms and summer grazing flats).



Bog zone forb enrichment

Habitat enhancements

Logs salvaged from clearance associated with a major spillway upgrade project at a nearby reservoir have been used in our program to create 70 habitat log piles (scattered throughout the revegetation site). These piles which might otherwise take 200 years to form from newly planted trees (Manning *et al.*) now provide terrific perches for insectivorous woodland birds and hides for reptiles.



Habitat log pile



Close-up of the grass emergence

Results so far

The Adelaide Hills have received good winter rains this year so it wasn’t surprising that field emergence from our sowings have been excellent with an average of 50 grasses/m². We will continue to monitor the development of seeded areas over the 2017-18 summer and look to selectively control weed threats early next winter. Another exciting challenge for next year will be an attempt to translocate 15 orchid species salvaged from another project site with help from local orchid legend Les Nesbitt. Hopefully there will be much more to report on what we think is an exciting ecological restoration program which encompasses many different techniques and groups.



Les Nesbitt salvaged orchids

¹ Manning, A.D., Cunningham, R.B. and Lindenmayer, D.B., (2013) Bringing forward the benefits of coarse woody debris in ecosystem recovery under different levels of grazing and vegetation density. *Biological Conservation* **157**, p204-214.

Rod White

Program Manager Grassy Ecosystems
Greening Australia (VIC)

Restoration within the Western Grassland Reserves & the scourge of Annual Weeds

In the last edition of the Grassy Gazette I wrote about how Greening Australia commissioned by DELWP was undertaking the reestablishment of approximately 1.2ha of Plains Grassland vegetation within the Western Grassland Reserves System at Mount Cottrell west of Melbourne. Now 12 months on the site is establishing well with a diverse suite of species as well as a surprise appearance – read on to find out more.

Due to the rocky nature of the site and the unpredictable rainfall associated with the area we always knew that this project was going to be challenging. The main challenge which will surprise few has been annual weeds, particularly Wimmera Rye Grass. This management issue has presented itself at a number of other sites this year also due in part to ideal spring growing conditions. So, I thought it may be worthwhile to let you know of a few management techniques that we have employed to deal with the issue of annual grassy weeds and some Pro's & Con's of each method (Table on Pg. 17).

Now, I mentioned earlier that a pleasant surprise cropped up within the restoration area in October – Austral Trefoil (*Lotus australis*). A rare perennial herb or subshrub from the family Fabaceae. No less than 8 of these individuals have been identified so far. What is surprising is that this species was not in the seed mix that was sown in November last year. Leading us to the conclusion that seed has been lying dormant for at least the past 60 years (which is approximately the length of time this area has been cropped) just waiting for the opportunity to germinate. Exciting stuff!

Overall the site is establishing well with a good cover of Wallaby Grasses (*Rytidosperma* spp.), interspersed with Spear Grasses (*Austrostipa* spp.), Silky Blue (*Dichanthium sericeum* ssp, *sericeum*) and Windmill Grass (*Chloris truncate*)



Blushing Bindweed (*Convolvulus angustissimus* ssp. *angustissimus*)

Wildflowers identified so far include Bulbine Lilies (*Bulbine bulbosa*), Common Billy-buttons (*Craspedia variabilis*), Blushing Bindweed (*Convolvulus angustissimus* ssp. *angustissimus*), Austral Trefoil (*Lotus australis*) and the Basalt Podolepis (*Podolepis* sp. 1).

Another point worthy of mention is that the site has been deemed appropriate to receive translocated rare and threatened species including the Large-headed Groundsel (*Senecio macrocarpus*), which appear to be recovering well from the shock of being dug up and planted elsewhere.

The 12 month post seeding management period has now been completed for the site, with ongoing management being the responsibility of Parks Victoria. Let's hope that this small restoration intervention within the Western Grassland Systems area leads onto more ambitious restoration goals across the reserve in the coming years.



The rare Austral Trefoil (*Lotus australis* var. *australis*) in seed.

Left: Common Billy Buttons (*Craspedia variabilis*)



A sea of Wallaby grass!

Technique		Pros	Cons
Mechanical	Brush-cutting	<ul style="list-style-type: none"> • Targeted • Can work in rough/rocky terrain 	<ul style="list-style-type: none"> • Labour intensive
	Mowing/slashing	<ul style="list-style-type: none"> • Immediate result 	<ul style="list-style-type: none"> • Labour intensive • Not suitable for rocky terrain • Produces thatch that should be collected/burnt
Chemical	Spray topping	<ul style="list-style-type: none"> • Very effective in stopping seed-set 	<ul style="list-style-type: none"> • Timing is critical • Off-target damage possible • May stop seed set in native grasses
	Paraquat Dichloride	<ul style="list-style-type: none"> • Very effective in stopping seed-set • Doesn't affect established perennial grasses • Cost effective 	<ul style="list-style-type: none"> • Temporarily sets back younger native grasses
Burning			<ul style="list-style-type: none"> • Forego native seed set/drop for a season
Grazing	Sheep	<ul style="list-style-type: none"> • Relatively inexpensive option if you have the sheep already • Sheep get a good feed 	<ul style="list-style-type: none"> • Require sheep and good fencing • Difficult to avoid impacts on natives

Table: Pros and cons of grassland management techniques.

Jess Gardner

Ecologist, Greening Australia (VIC)

Jallukar Native Grasslands Project

In 2016 a combined meeting of the new Wildlife Art Museum of Australia, the Grampians branch of the Australia Plant Society and Jallukar Landcare acknowledged there was a critical 'need for native seed' required to undertake grassland restoration in the region. Delegates also recognised the presence of a highly skilled and diverse volunteer base in the Grampians region which could assist with implementing restoration programs.



Jallukar Native Grasslands Core Project Team

To this end (and with support from the Wimmera CMA) the Jallukar Native Grasslands Project was initiated. This project, which is a partnership between Greening Australia and the Jallukar Landcare, has to-date totally exceeded early expectations with over 50 volunteers now involved. At times it seems momentum and enthusiasm levels are hard to keep up with! This is certainly not a bad problem to have. Indeed, we are excited that two new Landcare proposals (administered by the WCMA) have also been successful ensuring this surge in momentum continues.

Through this project we aim to increase the local community's capacity to undertake high quality grassland restoration. Our first intended restoration will be at the proposed new Wildlife Art Museum of Australia site near Pomonal. During this first year of the project we held several plant ID and seed collection workshops. The workshops gave participants the knowledge and confidence to return to their properties to collect seed resulting in over 30 species collected (from a diversity of locations).



Volunteers Wendy, Lyndon and Anthea collecting seed at the Illawarra State Forest.

Landholders have also begun sharing discoveries of native grassland plants from their own properties via our Facebook page. This has been a great way to keep people involved and updated in between workshops.



The lovely Angela Turrell and fearless project co-leader.

Another important gain for the project was that Phill Williams of Pomonal generously donated the use of his nursery to assist with plant propagation and seed production. We are very excited to be collecting seed from the region and using Phill's nursery to produce extra seed for restoration through our seed production area.



Lloyd Thomas our nursery volunteer's co-ordinator.



Project Steering Committee Members Neil Marriot, Lloyd Thomas, Wendy Marriot, Glenda Lewin and Phil Williams (missing members Jess Gardner, Jacqueline Ridler, David Margetson, Angela Turrell and Rita Bikins).

Recently 15 members of our group travelled to Woorndoo to attend the launch of the Woorndoo Land Protection Group's roadside restoration project. It was a fantastic opportunity for our Jallukar group to observe what's been happening at Woorndoo as their project is a couple of steps more advanced than ours. The day certainly helped us remain focussed on the end goal of achieving our restoration and provided a lot of opportunities for shared learnings as these parallel projects continue to evolve.

At present we are undertaking a targeted field collection for species that were missed in last year's collection. We are also in the process of establishing several other species into in-ground seed production beds for bulk harvest. Finally, we are also continuing to run a series of educational workshops for our wonderful volunteers. If you would like to join the Jallukar Landcare email list or facebook page please contact Angela Turrell from Jallukar Landcare: ange.turrell@gmail.com and become part of our grasslands journey.

Jane Kenny

Project Officer, Greening Australia
(NSW)

Wildflower Roundabouts - Urban Delights!

In September this year, myself and the rest of the Richmond SPA team were lucky enough to be involved in planting native wildflowers and grasses into a large roundabout in Camden (Paul wrote about planning for this in last year's Gazette). During the year we had grown a variety of beautiful wildflowers and grasses at our SPA which is normally focussed on producing seed for restoration work.

Roundabouts in this region are normally filled with showy annuals (Pansies and Petunias) so our roundabout planting aimed to showcase in a landscaping setting the magnificent aesthetic values of our perennial native ground flora. We installed 16 species (several locally rare) and near to 6000 plants on the day. This was a collaborative effort with crew from Camden City Council, Mount Annan Botanic Gardens and GA all working together on this exciting venture. The table below lists the species we used (all propagated from seed produced in our SPA).

Grasses	Herbs	
<i>Capillipedium sp.</i>	<i>Bulbine bulbosa</i>	<i>Linum marginale</i>
<i>Cymbopogon refractus</i>	<i>Calotis cuneifolia</i>	<i>Podolepis jaceoides</i>
<i>Eragrostis elongata</i>	<i>Chrysocephalum apiculatum</i>	<i>Ranunculus lappaceus</i>
<i>Sorghum leiocladum</i>	<i>Coronidium scorpioides</i>	<i>Rhodanthe anthemoides</i>
<i>Themeda triandra</i>	<i>Craspedia variabilis</i>	<i>Thysanotus tuberosus</i>
	<i>Dichopogon fimbriatus</i>	<i>Wahlenbergia stricta</i>

The plan for the roundabout was to create a feature showcasing these natives according to their flower colour and plant type (form and structure).

These we installed as replicated blocks in concentric circles (all marked out on the day before). The outermost rings featured wildflowers in blocks of yellow, blue, and white and towards the centre were blocked grasses. The central section was structurally dominated by several tall Gynea Lilies (*Doryanthes excelsa*). These had been scattered randomly around the site previously which we then translocated to the centre. The area also featured several pre-existing mature Angophora trees that provided height and some light shade. Amazingly, while working on the site we realised it also provided a home for several native Whip Snakes who took great interest in what we were doing.



Lunchtime on the planting day.



. It was gruelling but fun. Plants in the ground!

There were a variety of reasons for our species choices for this project. In addition to providing a visual impact we also wanted to increase local native plant diversity (which is low). However, in line with our Whip Snake friends, we also hoped the planting would provide habitat and resources for other fauna including invertebrates. We know from the study undertaken by Nina White (written up in a past Gazette) that the native wildflowers growing in our SPA attract a huge range of insects including the Blue Banded Bee (whose buzz pollination is critical for some of the species we grow) and Hover Flies. For this reason, we hope that once established the roundabout flowers provide a similar resource for Camden invertebrate residents!



We hope our planting becomes a feature in coming years.

Following planting the Council provided several weeks of supplementary watering to help things establish. In that time there has been some unwelcome interest, not from people, but from rabbits! (the site is very close to the Mt Annan Botanic Gardens who's bushland areas harbour lots of this pest). This has been quite revealing because they have clearly selectively grazed several forbs over others (and none of the grasses). In fact, of all the wildflowers used only the *Rhodanthe* and *Podolepis* were spared (or considered not yummy enough). Since then the council installed a low wire barrier fence so we hope things will eventually recover from this set-back. Paul visited the site in recent weeks and reported that this seems to be happening.



Rhodanthe and *Podolepis* seemed not palatable to the rabbits.

This has been an exciting project for us. It's given our team the opportunity to collaborate with other organisations in a fun manner, and to use rare flora from the Cumberland Plain in an innovative setting. We expect to learn more in the future on how they'll behave in this modified landscape setting, and what actions will be required in their maintenance. Most of all we hope the residents nearby notice and begin to enjoy what's been done. If so, this might become something that takes off in other locations, council areas, towns and cities!

Cath Olive

Euroa Arboretum

Exciting 'Discoveries' at Our Euroa Grassland Restorations

Our Euroa Arboretum grassland restoration is two years old this year and really hitting its straps. Areas that were still bare soil last year (and worrying me somewhat) are now prolific with daisies. Plant diversity continues to increase and goes through seasonal fluctuation. For example, in early spring, Hoary Sunrays (*Leucochrysum albicans*) dominated the site presenting a gorgeous vista of yellow, gold and crimson. Now native grasses are seeding everywhere and you need to walk in through the sward to see the wildflowers proliferating below.

Some of the best 'discoveries' coming from our restoration have been quite unexpected. It is great now that Sundews (*Drosera* species), are common having colonised into the gaps between sown vegetation. Also, Dwarf Bush Pea (*Pultenea humilis*) and Loose Flower Bush Pea (*Pultenea laxiflora*) which are found naturally in other parts of the Arboretum and which must have had viable seed buried below the scalped level, have begun to germinate with their seedlings emerging prolifically across the site. It's amazing to think that their long-buried seed (at least ten centimetres down) has now found an opportunity to emerge. The most intriguing 'discovery' is the Euroa Guinea Flower (*Hibbertia humifusa ssp. erigens*). This prostrate little guinea flower is EPBC listed and a species we have worked on locally for 5 years diligently planting it back into the landscape from cuttings but sadly with very little success. Amazingly, this year in a discrete area within the restoration (about 200m²) hundreds of plants of this rare species have now begun to emerge like crazy! Again, it seems the grader blade has done the trick, where hours of propagation, planting and nurturing have not.



Early spring and the daisies are dominating the grassland.

The other fascinating ‘discovery’ from our Euroa restorations has been at Kate and Lance’s remnant native pasture (also mentioned in past Gazette updates). This one-hectare site was essentially clean Wallaby Grass (*Rytidosperma setacea*) but to increase forb diversity it was over-sown with lilies, peas and daisies by Rod (White) and David (Franklin) two years ago. Last year I reported that we considered the over-sowing to have failed because we had observed only 3 Sticky Everlastings (*Xerochryseum viscosa*) in the time since. My feeling was the new forb species had been prevented from getting a foothold because the wallaby grass was so dominating. But Mother Nature dictates that this year I must eat those words. While the Wallaby grass continues to grow strongly there are now a great many daisies growing and taking hold on the site. The lesson? Perhaps it’s not a great idea to second guess Mother Nature – she seems to like to have the final say.

For more information visit the website:
<http://euroaarboretum.com.au/native-grassland-establishment-at-euroa-arboretum/>



EPBC listed species *Hibbertia humifusa* ssp. *Erigena*



Common Rice-flower (*Pimelea humilis*) in the foreground, with Sticky Everlasting (*Xerochrysum viscosum*) and Clustered Everlasting (*Chrysocephalum semipapposum*) towards the back.



Foxtail Spear-grass (*Austrostipa densiflora*)

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