UnderStories

promoting preserving protecting & rehabilitating native vegetation

Autumn 2015, No 69

Contact details

Enquiries, newsletter articles and memberships to:

Oliver Strutt

Understorey Network Coordinator Mobile: 0407 352 479 oliver@understorey-network.org.au PO Box 4535, Bathurst St, Hobart 7000

Committee

President Joan Rodrigues Vice-President De Deegan Secretary Anne Griffiths Treasurer Rupert Manners

Committee members

Amanda Cole Margaret Downie Mary Jolly Jeannie Mooney Warner Wait

Editor Anna Holan

Inside this issue

- 1 From president
- 2 From president
- 3-4 Seed collecting
- 5-8 White Gum regeneration
- 8 What's happening

PRESIDENT'S REPORT

Welcome to our autumn newsletter, at least I think that we are now in autumn but after the unusual summer that we have experienced who knows? I hope that the season had the advantage of assisting all of our seeds to germinate without too much of an impact from the occasional hot day that we managed to experience.

The past few months have been busy for the USN and I can now report that we are settled into our three branch "offices". Ollie splits his three day week between his home office in Richmond and space at the nursery in Glenorchy and we also have a hot desk drop-off and meeting room located on the mezzanine of Banjos Bakery Café in Salamanca. We had our first committee meeting there in February and really appreciated the central location and having coffee "on tap" but made for us. I want to extend sincere thanks to the owners, managers and staff of Banjos for providing the space for us.

Talking about the committee, yes here I go again! Some of our long term members will definitely not be able to re-nominate at the next AGM so we really are reaching crunch time as an organisation. If we do not have a viable committee we will not be able to continue into 2015-16. Our next meeting will be held on Monday 13th April at 5.15 and will finish between 7.00 to 730 pm. I want to extend an open invitation to any members who think that they might like to become involved in the committee to join us and see what goes on. We actually have a great deal of fun. If you would like to join us please email or telephone Ollie.

While on the subject of "fun" the people who decided to brave the weather and attend the walk and seed collecting at Bangor had a wonderful time. The original instructions had been to bring sun screen, sun hats and insect repellent so we turned up with wet weather gear, waterproof boots, woolly hats, not your typical mid-summer gear. Thirty people had originally accepted the invitation to attend and we were thrilled that despite the anticipated rain twenty arrived at the meeting place where we all drank hot coffee or tea to get us going. The attendees included some members who had journeyed from the north to spend a weekend on the peninsular and I hope that they still managed to enjoy the trip. I am not sure what the weather was at your house, I have a report that it rained all day at mine but those of us on the trip saw no rain after we turned south at Sorell. It was cloudy but not too cold, in fact we started to strip off the waterproofs quite early in the walk. The scenery was impressive and the previous rain had encouraged a number of very small and endangered species to flower which meant that we had to be careful to avoid walking on them. We managed to collect quite a lot of different seed so it turned out to be a successful day. The other interesting thing to note was that Dunalley now has very few signs of the fire. There are obviously fewer buildings and many empty house sites but a number of new houses have been built and the local vegetation has displayed vigour in recovering from a traumatic fire event. A great day was had by all and our sincere thanks are extended to the Dunbabin family for allowing us to access their property.

Having mentioned fun I also want to thank everyone who attended the USN Christmas party at the nursery, it was great to be able to meet so many members. I also want to thank the cooks who kept the pizzas coming. I hope that everyone had time to inspect the alterations and improvements that our volunteers have made before they started to eat and enjoy themselves. Unfortunately I was not able to stay to the end but when I left the party was in full swing.

We will soon be having a plant sale from the nursery and all members will be advised by email. An advertisement will also be placed on Gumtree because this is a major fund raising activity for us and often results in new members applying to join. We are also trying to identify a suitable winter event for members, but if past performance is an indication of future performance we will tell you to come with scarves, gloves and wet weather gear and we will all get sunburn!

This is the point at which I will end but please remember that any successful organisation needs a successful committee so please think about joining us. If anyone wants to discuss the organisation or the activities of the committee please feel free to contact me on 0427097402.

Joan Rodrigues

AUTUMN'S FLOWERING PLANTS ENDEMIC TO TASMANIA



Prionotes cerinthoides



Leptospermum grandiflorum



Hakea megadenia

SEED COLLECTING AT BANGOR FARM ON FORESTIER PENINSULA



Lagoon Bay Bangor Farm

Growing up in Bangor Maine on the northeast coast of the United States, my siblings and I used to go on adventures through the boreal forest along Kenduskeag Stream, a tidal waterway that flowed through my hometown. We imagined Penobscot Indians long ago picking native blueberries, fishing Atlantic salmon and hunting white-tail deer.

These memories flooded my mind as I was sauntering through the sclerophyll forest at Bangor Farm on the Forestier Peninsula a couple of weeks ago in February collecting seeds for the Understory Network (USN) seed bank. It wasn't hard to imagine the Pydairrerme Band of Tasmanian Aborigines long ago shucking oysters and hunting wallabies on the very land where I was standing.

Since the 1890's, this 15,300 acre farm has been managed by the Dunbabin family who conserves 80% of its native forest for its natural and cultural significance. Our group of 18 seed-collecting enthusiasts lead by USN Coordinator Ollie Strutt spent the afternoon bushwalking and learning how to gather, store and propagate seeds. Bangor is ripe with native species, including forest daisy bush, dogwood, banksia, tea tree, mother fern, spiky wattle bush, blackwood and even the rare pricklfut lavender.



Ollie sharing tips with seed collectors at Bangor Farm

As a bonus during the walk, we crossed paths with Mr. Slo-Poke Wombat and even had a bit of a chat with Bill the wildlife biologist who was checking a hidden camera that records devil activity for the Save the Tasmanian Devil Program.

Toward the end of the day, we walked out of the forest at Two Mile Beach, the perfect place to stop and eat lunch and catch impromptu pearls of horticultural wisdom from Ollie. Standing among the bull kelp and shell middens looking around at the small groups of people gathered on the beach who were totally immersed in the wonder of the moment, I couldn't help feeling a sense of gratitude and accomplishment. We were doing our part, continuing the legacy of protecting and preserving this wild stunningly beautiful piece of Earth.

Keep a look out in upcoming issues of *Understories* for the next seed collecting walk announcement. I still get a thrill from a good adventure and you don't want to miss the next one.

Jeannie Mooney

STIMULATING WHITE GUM REGENERATION IN AGRICULTURAL LANDSCAPES: CAN WE INCREASE HABITAT FOR THE FORTY-SPOTTED PARDALOTE WITHOUT

Oliver Strutt & Magali Wright This article originally appeared in *The Tasmanian Naturalist* 136 (2014)

INTRODUCTION

The endangered Forty-spotted Pardalote (*Pardalotus quadragintus*) relies almost exclusively on white gum (*Eucalyptus viminalis*) for food and shelter. The decline of this eucalypt species has been identified as a factor in the estimated 60% population reduction of the Forty-spotted Pardalote in the 17 year period between survey efforts (Bryant 2010). Bryant's conservation assessment revealed that a range of age structures, especially senescing trees, are missing from landscapes supporting Forty-spotted Pardalote habitat, especially on North Bruny Island. Hollows in mature white gums provide nesting habitat and young trees contribute to the bird's food in the form of lerps and manna and ensure the long term persistence of its habitat.

This work focused on investigating practical methods for stimulating natural regeneration of white gum to replace young trees in agricultural landscapes. To understand the factors limiting white gum regeneration in the Forty-spotted Pardalote's range, we established two long term studies on North Bruny Island in 2012-2013 (Figure 1).

These studies investigated the following questions:

 \cdot can we stimulate white gum regeneration in fragmented woodland remnants?

 \cdot can we stimulate white gum regeneration around isolated paddock trees and how far from these trees can seedlings germinate?

Along with filling important knowledge gaps on white gum life history, the first study was designed to offer insights into remnant restoration and improve the set of tools available to land managers for managing eucalypt dominated woodlands. In this study we investigated the application of grazing exclusion (sheep alone, and sheep and native browsers) and a range of competition manipulation treatments including scalping (removing the top layer of soil and plant roots), burning, herbicide spray and addition of wetting agent (to mimic some of the effects of burning when burning cannot be safely undertaken).

The second study was designed to investigate the effectiveness of isolated paddock trees as regeneration nodes in largely cleared landscapes. Encouraging natural regeneration from isolated paddock trees has potential to reduce restoration costs, whilst also increasing restoration success through exploiting local genetic material (Dorrough & Moxham 2005). Isolated paddock trees can act as stepping stones between patches (Fischer & Lindenmayer 2002), particularly for birds with poor dispersal ability, such as the Forty-spotted Pardalote (Woinarski & Bulman 1985). By understanding the distance from the canopy that seedlings are likely to germinate and establish we can minimise the area taken out of production for restoration whilst maximising white gum recruitment.



Figure 1. Sites for the regeneration of Eucalyptus viminalis in remnants experiment (red squares) and regeneration around isolated paddock trees experiment (black triangles) on North Bruny Island

In addition to the competition manipulation treatments (tested in the first study), another restoration technique with the potential to assist natural regeneration, harvesting water runoff through micro catchments (Rango & Havstad 2009) or creation of swales was tested in the second study. Though it is early days yet, 2-3 years into these studies we are able to report trends (rather than recommendations) that can help inform land mangers planning low-cost activities to improve the condition and extent of Forty-spotted Pardalote habitat.

METHODS IN SUMMARY

Regeneration in remnants

To understand factors limiting white gum regeneration in the range of the Forty-spotted Pardalote, a long-term study was established on North Bruny Island in early 2012. In this experiment, we investigated the effect of different grazing exclosure levels (none - the control, sheep only, and complete exclosure) on white gum regeneration in a randomised block experimental design across a total of 30 plots over two sites. In addition, the 30 plots were divided into 120 sub-plots within which we investigated the effect of a range of different competition manipulation methods (none - the control, burning - Plate 1, scalping, spraying herbicide and applying wetting agent) on white gum regeneration at the same sites. In the second year, the burning treatment was applied to 15 of the 30 subplots that were slashed in the first year. Wetting agent was applied once to the remaining 15 sub-plots in year 3.

Regeneration around isolated paddock trees

To understand the capacity of individual isolated paddock trees to function as regenerative nodes, long-term exclosure fences preventing stock and some native herbivore grazing (they were not possum proof) were established downslope from seven isolated white gums across North Bruny Island (Plate 2). In this experiment, we investigated the distance from the canopy edge (0-30 m) that recruitment of white gum seedlings can occur. It also investigated the creation of swales and soil disturbance via cultivation to increase regeneration. The experiment was set up in December 2012. Along with measuring seedling regeneration (number, height species of seedlings) we also collected data on life form cover and a number of other variables.

More detailed information on the methods can be obtained from the authors. A map of the locations of experimental sites is provided at Figure 1.



Plate 1. Applying the burning treatment to a stock grazing exclosure



Plate 2. Isolated Eucalyptus viminalis in paddock two years after experimental set up

Regeneration in remnants

In the first year of monitoring (4 months after establishment) 15 white gum seedlings germinated in the trial plots. However, they were not the most common species observed with a total of 54 eucalypt seedlings observed (including *E. pulchella*, *E. ovata* and *E. globulus*). The average height of the white gum seedlings was 1.0 cm (Plate 3) in comparison to 1.8 cm for other eucalypt species. Of the four competition manipulation methods, scalping resulted in the highest number of eucalypt seedlings and there were no white gum seedlings observed in the treatments with no grazing exclusion.



Plate 3. A *Eucalyptus viminalis* seedling, with cotyledon and the first true leaves, in a stock only exclosure and scalping competition manipulation method treatment combination four months after experimental establishment (image taken June 2012)

In the second year (15 months after establishment) none of the eucalypt seedlings of any species from the first year remained and 13 new seedlings were observed of which ten were white gum. The white gum seedlings had an average height of 2.2 cm (Plate 4). The burning treatment resulted in the highest number of eucalypt seedlings, followed by the scalping treatment. During this monitoring event there were no eucalypt seedlings observed in the plots without the exclusion of grazing.

Three years on, white gum was the most common species observed across all treatments (25 of the 34 seedlings). The white gum seedlings were considerable taller than those observed in the first two monitoring events with an average height of 9.4 cm (Plate 5) and one of the seedlings present at 15 months was observed to have survived between monitoring events. It is likely that many of these white gum seedlings germinated in the spring of 2013, as they were considerably taller than those observed in previous years, suggesting that they had a longer growing period than those observed in the earlier monitoring events.



Plate 4. One of the largest *Eucalyptus viminalis* seedlings observed at 15 months, which was found in a total exclosure and burning competition manipulation method treatment combination (image taken May 2013)



Plate 5. The same *Eucalyptus viminalis* seedling as in Plate 4, in a total exclosure and burning competition manipulation method treatment combination (image taken June 2014)

There were no white gum seedlings observed in plots with no animal exclusion. Interestingly, the highest number of white gum seedlings was observed in the stock exclusion rather than the plots with exclusion of both stock and native browsers (Table 1), although total eucalypt seedling height was higher in the total exclusion. Of the four competition manipulation methods, burning and then scalping resulted in the highest number of eucalypt seedlings of all species (Table 2).

The experiment will be monitored again in 2015, which will allow the survival of the seedlings observed so far to be followed. This monitoring period will also capture any additional eucalypt germination in spring 2014.

. Regeneration around isolated paddock trees

There were no new seedlings observed in the first year monitoring (five months after experimental establishment). In the second year, only three of the seven paddock trees had white gum germination, with one tree accounting for 17 of the 21 seedlings. Excluding the one tree that had the most regeneration, the other seedlings were only found in plots with swales. Seedlings were only found in the plots that were within 15 m of the canopy, with the majority found in the first 10 m.

TRENDS RATHER THAN RECOMMENDATIONS

For both studies, low seedling numbers and the high number of plots lacking seedling germination mean that it has been difficult to obtain statistically significant results thus far.

Trends so far suggest that grazing exclusion is essential to reduce browsing pressure and allow for eucalypt germination though interestingly there is no (significant) difference between exclusion of stock and native browsers and stock exclusion alone. While the results to date lack overall significant effect of competition manipulation treatment, the scalping and burning treatment has consistently shown the highest level of regeneration.

These results still tell us little about white gum establishment, as a high level of seedling mortality is apparent between monitoring events. However, the monitoring conducted in 2014 suggests that patience is the key, with the first observation of seedlings that are likely to have survived a summer season. Time will tell if these seedlings do in fact go on to establish in the long-term.

It appears that isolated paddock trees can be used as regeneration nodes, by excluding stock from small areas immediately surrounding the trees. Early results suggest that exclosures that surround isolated paddock trees 10-15 m from the canopy can be used to reduce fencing costs. Results so far indicate that paddock trees surrounded by more native, rather than exotic or modified, ground cover should be targeted as regeneration nodes, to encourage white gum recruitment in the short-term.

NEXT STEPS

The experiment will be monitored again in 2015, which will allow the survival of the seedlings observed so far to be followed. This monitoring period will also capture any additional eucalypt germination in spring 2014.

For practical recommendations to be developed, at least five years of data will need to be collected as land managers are interested in treatments that lead to an increase in the number of eucalypt seedlings surviving over time, not just seedling germination, which has been observed not to be a reliable indicator. For these results to provide information on the best treatment to increase habitat for Forty-spotted Pardalote, monitoring the survival of *Eucalyptus viminalis* up to ten years after experimental set up will be the most informative, as this is the timeframe that *E. viminalis* begin to support this threatened species. The experimental sites are all within close proximity of extant Forty-spotted Pardalote colonies so any establishing *E. viminalis* within the study area will also have the potential to provide habitat for these birds in the future.

ACKNOWLEDGEMENTS

We would like to acknowledge the North Bruny landholders who have supported these experiments by letting us fence off small inconvenient plots in their paddocks. We would also like to acknowledge the support, assistance and input of Tom Wright, David Ratkowsky, the conservation team at the Royal Tasmanian Botanical Gardens, Jarrah Vercoe, Cassandra Strain, Bruce Michael (Murrayfield Station), Liz Quinn (Kingborough Council), Holly Hansen (NRM South), the team from Conservation Volunteers Australia (CVA) and Understory Network volunteers.

What's happening

Eucalyptus viminalis monitoring and Field Day Part of the North Bruny White Gum Regeneration Trial. When: Saturday 18th April (Monitoring) and Friday 24th April (Field Day) Where: North Bruny Island Rainforest species translocation working bee Relocating myrtle seedlings as part of an interesting project with Environment Tasmania. When: Sunday 24th May Where: Florentine Valley Eucalyptus morrisbyi monitoring

As part of our project funded by NRM South we will be doing some interesting work on this threatened species.

When: Saturday 6th June Where: Calverts Hill, Sandford

Please contact Oliver to find out how to get involved with any of these events.