



UnderStories

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Promoting, preserving, protecting and rehabilitating native vegetation

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Coordinator's Report

Apologies in advance for the length of this coordinator's report, it stretches over two pages as I take this opportunity to look back on the last year for the Understorey Network, as well as looking forward at our upcoming projects.

I would like to start by thanking the many volunteers who make this organisation tick. The committee is always supportive and it is great to have a group of people who care about the future of the Understorey Network, providing feedback, direction and working together to promote our aims.

Our growers of course are fundamental to the network and if they carry on at the rate they have been propagating, I believe before long we shall have restored the whole island. Add to this the powerhouse of the Tolosa Community Nursery and we truly are helping to green Tasmania. The nursery indeed has gone from strength to strength and the volunteers there do not bat an eyelid at the thought of propagating 5,000 or more plants for a project.

And projects we have... Glenorchy City Council has continued to support the nursery and sources all of its native plants for its parks and reserves from there. The other major project to grow for has been our 40-spotted pardalote habitat project that was funded by the Australian Government's Caring for our Country program. Ironically for the "Understorey" Network the focus of this project has been growing the majestic white gum (*Eucalyptus viminalis*), as this is the essential species for the threatened pardalote. The project has focussed on revegetating areas of white gum woodland on private properties in the Tinderbox and Bruny Island area. Apart from working with many wonderful landholders, this project has also developed many important partnerships with other organisations.

We are not alone in our aims of promoting, preserving and protecting Tasmania's native vegetation, and it has been a pleasure to work within a network of organisations on all of our projects. Partnerships are vital for achieving successful outcomes in natural resource management.

One aspect of our pardalote project was the establishment of a long-term trial on North Bruny Island, investigating methods for encouraging regeneration of white gum woodland. This trial was a partnership involving NRM South and Kingborough Council.

Continued on Page 2

Coordinator's Report (continued)

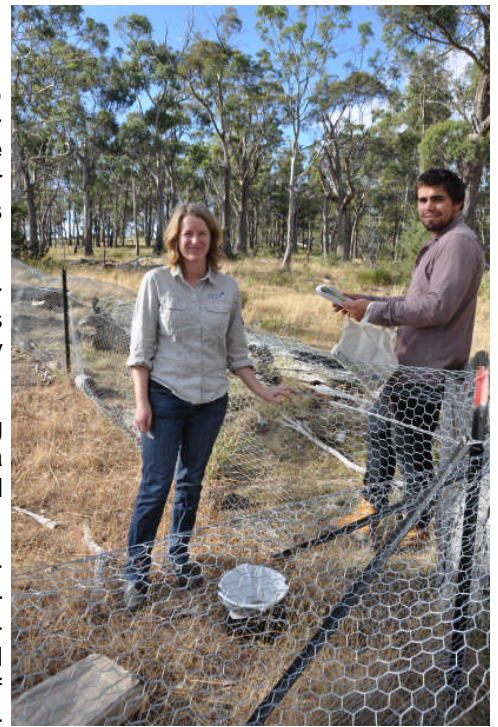
In the study we investigate a range of exclosure levels (none, sheep only, and sheep and native browsing animals) as well as a range of soil disturbance techniques (spraying, scalping and slashing). It is too early to be able to draw conclusions from the results, but this project, with the support of our partner organisations will continue, with more monitoring done next year, as well as an expansion of the trial to include burning, cultivation and swales.

This partnership will also continue through the Understorey Network coordinating revegetation activities on North Bruny on behalf of NRM South as part of a new project funded by the Australian Government's Clean Energy Future, Biodiversity Fund.

Through this fund, and another partnership, we will also be coordinating revegetation activities in the Midlands and Central Highlands, working on a project with the Southern Midlands Council, Derwent NRM, NRM South and Natural Resource Planning.

During the year our "Grow Wild" project has also continued, with sponsorship from Aurora Energy. This project has involved supporting three community Care groups around the state (Seven Mile Beach, West Tamar and Ulverstone) to revegetate sites. We have also facilitated seed collecting and propagation workshops, as well as opportunities for Aurora staff to get out of the office, get their hands dirty, and do some valuable community-environmental work. This project will continue for another year.

Another funded project that has drawn to a close was the Community Action Grant, that allowed us to revise and reprint our Grower's Guide, run workshops and update our online native plant database. Work is also still underway to update the design of our website.



Magali Wright NRM South and volunteer, Chris, monitor white gum trials



Students of Snug Primary School propagating seeds

Looking ahead, in addition to the projects I have already mentioned, the Understorey Network has also received funding to support the Grower's Scheme, also through the Biodiversity Fund. We also have two smaller projects funded by NRM South, one continuing work on the endangered *Eucalyptus morrisbyi*, and the other delivering a series of plant identification and seed collecting workshops (See What's Happening on back page) and a field day on revegetation techniques next year.

Another project just commencing is a schools project delivered on behalf of the Southern Coastcare Association of Tasmania (SCAT), that will involve doing seed collecting and propagation workshops with six schools and planting days on coastal sites with a focus on the Derwent Estuary. This is a great opportunity to engage the next generation.

Last year the Understorey Network was awarded the Tasmanian Community Achievement Award in the Nyrstar Environment and Sustainability Category. This award recognises the significant contribution that the organisation makes to the state of Tasmania and I would like to congratulate everyone involved.

I believe that the Understorey Network is a unique organisation, providing high-level on-ground environmental and community outcomes across the state whilst remaining a grass-roots volunteer based group. This unique position allows us to punch above our weight and through collaboration with other organisations achieve a great deal.

On a personal note, I think I have the best job in Tasmania. Being able to travel the state, see the cycle of life from collection of seeds, propagation of tiny seedlings, through to watching the plants grow at sites important to the community, and inspiring others along the way, is very satisfying.



Oliver Strutt Volunteers from Conservation Volunteers Australia relax after a hard day's seed collecting

Part 2 Germination of native plants: the science and experiences of the Tasmanian seed bank

Timing is everything

In environments with predictable fluctuations in water availability, many plants have developed mechanisms to monitor the environment and germinate at the beginning of peak moisture availability. Plants from Mediterranean environments typically establish over the winter period where cool (but not cold) temperatures are matched with winter rainfall. Such plants usually have a preferred germination temperature of around 10°C but often only after being exposed to temperatures of 20-25°C for several weeks. This requirement ensures that the seeds germinate in the Autumn period and have several months to established before the next dry Summer. Such behavior is also observed in Winter annuals a group of plants common in Mediterranean zones but also in temperate dry rocky environments.

In cold temperate and alpine zones water availability is usually good till late into summer, but water can be locked away for several months as ice during the winter period. Additionally unexpected late frosts can also be a danger to young seedlings. In this environment we often see the exact opposite of behavior of seed of Mediterranean zones. Here seeds will often prefer to germinate at 20-25°C but only after being exposed to several weeks exposure to 5°C. A classic treatment for a Scottish moorland sedge (*Carex*) species is 12-16 weeks at 5°C followed by incubation at 35/20°C. This germination temperature strikes many as being very high for a Scottish moor but it should be remembered that air temperatures and soil temperatures can be very different. If one can envisage a black peat soil pocket nestled between sheltering vegetation or rocks the idea that very warm temperatures can be achieved seems less fanciful.

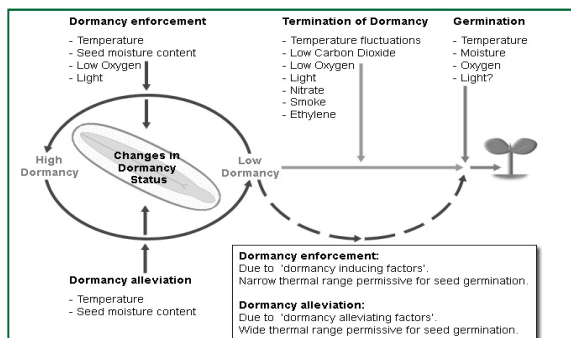


Figure 3. Theoretical model of dormancy & germination, listing factors likely to enforce or alleviate dormancy and terminate dormancy to achieve germination. Adapted from Benec-Arnold RL, *et al.* 2000. Environmental control of dormancy in weed seed banks in soil. *Field Crops Research* 67: 105-122.

Additional triggers

Much of Australia's bush is synonymous with fire ecology and not surprisingly this impacts on germination behaviour. As mentioned earlier the heat of the fire event can crack hard seed coats and therefore remove physical dormancy. A very different fire event trigger that has become well known is the effect of smoke chemicals. Commercially available smoke water products are now readily available and commonly used to germinate native plants from Australia and South Africa.

The burning of green leaf matter releases a complex cocktail of large organic compounds and it appears that these chemicals can stimulate germination. Of what we currently know the "smoke response" has probably evolved independently several times and through different mechanisms. So far research has identified two specific compounds that trigger germination in different plant species and it seems likely that other compounds and biochemical pathways will be discovered with continued research. What germination studies have also shown is that the presence or absence of smoke compounds isn't simply all there is to this response. The timing of the exposure can also be important.

Studies carried out in New South Wales showed that some heathland *Epacris* species germinated in cooling autumnal conditions in the presence of smoke but only after being exposed to hot summer temperatures for several weeks. If the smoke treatment was delayed and applied during winter no germination took place during the winter or at similar optimal germination temperatures experienced during the spring. It appears that the seeds cycle through smoke sensitive and insensitive phases. They were only sensitive by the end of the summer and if the smoke trigger wasn't received, the cooling temperatures optimal for germination eventually induce insensitivity to the smoke trigger and the seeds would then remain dormant until the following summer. Germination of Tasmania's *Epacris* species shows similar behaviour in a few of our taxa. However in the 23 species we have tested so far, there is huge variation and again this probably reflects the various environments that they inhabit. Not all of the Tasmanian taxa show a requirement for smoke and although most seem to have a physiological dormancy, not all of them are dormant.

Germination in Tasmania

So after six years and over 3,500 tests what can we actually say about germination behavior in Tasmania. Well to be honest, this level of work is still barely scratching the surface, but some patterns do seem to be appearing.

Not surprisingly the difficulty of various plant families in Tasmania doesn't appear to be that different to what we observe at the global level at the Kew seedbank. Table 1 show the statistics for the ten most tested families at the Tasmanian seedbank. For a collection to have successfully passed a germination test it must achieve greater than 75% germination.

Table 1: Germination success of the 10 best represented plant families in the Tasmanian seedbank (March 2011). Families such as Ericaceae and Cyperaceae pose a challenge to germinate primarily due to Physiological Dormancy.

Family	Collec- tions Tested	Rounds of Testing				Collec- tions Passed	Average Result	Average Tests per Collection
		1	2	3	4			
Asteraceae	133	74%	17%	7%	2%	74%	89.0%	5
Poaceae	68	82%	16%	1%	0%	69%	81.0%	5
Cyperaceae	61	74%	18%	7%	2%	30%	62.5%	7
Ericaceae	53	75%	21%	4%	0%	9%	37.7%	7
Myrtaceae	31	81%	13%	6%	0%	71%	84.7%	5
Fabaceae	28	92%	4%	4%	0%	86%	93.5%	3
Rhamnaceae	28	50%	36%	7%	7%	32%	74.6%	6
Juncaceae	23	65%	22%	9%	4%	74%	94.1%	7
Proteaceae	17	88%	6%	6%	0%	71%	79.0%	4
Plantaginaceae	17	88%	12%	0%	0%	59%	87.7%	6

From the table you can see that a family like the Fabaceae is very straightforward. 86% of the collections we have tested have passed a germination test and the bulk of collections (92%) have only had a single round of tests. Conversely the Cyperaceae and Ericaceae are the most challenging families to test. In the Cyperaceae some of the testing failure might be attributable to difficulties in determining maturity when collecting and processing, but a reasonable portion of failure can be assigned to unresolved physiological dormancy. This last point is most definitely true for the Ericaceae, the collections seem to retain viability under test but just will not germinate.

The difficulty we currently have with the Rhamnaceae is interesting and reflects the fact that although this family is Physically Dormant it is also frequently Physiologically Dormant, a fact not appreciated in our early testing work. Physiological dormancy levels seem surprisingly high in some of our collections and successful results will probably come in the future as we better target the conditions we use by looking at where the collections were made.

This brings us on to the question of provenance. As mentioned earlier when discussing Physiological dormancy, the provenance of a collection has probably the largest bearing on the nature and depth of the seeds dormancy and also germination temperature preference.

Plants from the North and East coast typically seem to germinate well at cool temperatures of 10-15°C and occasionally after receiving several weeks of warm stratification. As we head south or move inland however this begins to change. The germination temperature optimum starts to go up and cold stratification requirements become common. By about 500m we start encountering surprisingly deep cold stratification requirements. However throughout Tasmania we find non-dormant species from coastal dunes to the heaths of the Central Plateau. It's important to remember that germination behaviour can be very different across a plants native range. Collections of *Oreomyrrhis* from Tasmania's Central Highlands have all proven to be non-dormant and have a germination temperature preference of around 15°C. However *Oreomyrrhis* collections made by the Canberra seedbank in the Australian Alps show a physiological dormancy, even for the same species collected here in Tasmania.

Applying the science to home practice

So what does all this mean to those wanting to germinate natives but don't have a laboratory and several incubators? There are a few tips that one should follow that may help with success but might also help avoid apparent failure...

- 1) Check your seed quality. Cut-test a sample of your seeds to check that you actually have good seed. This might seem apparent but it can be very difficult to tell and empty or infested seeds will never germinate. Also bear in mind that non-viable seed can encourage fungal growth that can jeopardize your good seed and/or seedlings. If you can remove the rubbish do so. If you can't sow your material thinly into several pots.
- 2) Sow as soon as possible. Some seed can lose viability very quickly if not handled or stored well. It is true that some species do germinate better if left to mature for a month or two, however it's also true that for some species immediate sowing can result in rapid germination but holding on to material can induce dormancy that in some groups is very deep.
- 3) Consider the provenance and the life cycle of the plant to determine when to sow. It seems reasonable that the best approach to success is to try and mimic what occurs within a plant's natural environment, however this isn't necessarily intuitive. Moisture and temperatures in the soil are not the same as that recorded in climate data. Hopefully some of the examples given above will help provide pointers.
- 4) Considering advice and anecdotes. Given that we know that any species germination behaviour can vary across its range and even from season to season what can we really believe from germination recommendations? As mentioned earlier the taxonomically linked trait of Physical Dormancy is very consistent, so where advice is given to scarify or heat shock seeds of related species this is probably reliable. Difficulty comes with Physiological dormancy and germination temperatures. These can vary depending on where the plant was sourced from and unfortunately this is rarely ever recorded in horticulture literature. Are the recommended techniques reasonable given the provenance of your collection? Other clues may be gleaned by looking at other plants growing in the same habitat with similar flowering and fruiting periods.
- 5) One size does not fit all. As can be appreciated from the examples above seeds use a variety of techniques to germinate and what may work for one species will fail for another. Some species may be drawn out of dormancy from a hot summer bake whilst others may be driven into deeper dormancy under the same conditions. When we just don't know (which is almost always the case) a diversity of approaches would seem sensible. If you have several spots in the garden where you can place seed pans this may well be worth a try.
- 6) Be prepared to wait. Some species can have very deep and complex dormancies. Research carried out on Californian *Arctostaphylos* (stone-fruited Ericaceae) indicated that upland species had to pass through two winters to germinate whereas lowland species had to pass through three winters!

Hopefully this article will give you an appreciation of the ingenious ways that plants lock the potential of seeds until just the right moment. It may even give some consolation to the frustration that sometimes comes from trying to germinate native plants. For many species it can be a real challenge and much of the testing we conduct at the Tasmanian Seed Conservation Centre ends in failure.

I also hope that by explaining a little of what's going on you may have thought of some new approaches in how to tackle our Tasmanian natives. For the sake of this article I've not got down into the nitty gritty of what various species require but if you'd like to know what species the Tasmanian seedbank has tested and what treatments we've tried then you're in luck. In 2008 we made our germination data available to the public through the RTBG website. The TSCC Germination Database is available at <http://www.rtbg.tas.gov.au/tasgerm>. To support the database we've also created over 20 pages of information on germination and seed dormancy explaining a little more about the current scientific understanding and suggestions as to how to implement the techniques we use in the laboratory at home. As our testing continues we'll add more data to this database, but this may soon be eclipsed by a far more exciting project to share the germination data of the entire Australian seedbank network. When this comes online we'll be sure to announce it so keep your eyes on our website and the RTBG Flickr site <http://www.flickr.com/photos/rtbg/>.

James Wood

Bellerive Bluff Land & Coast Care Group

It was not so many years ago that there was nothing better than a sheep track along the shoreline on the city side of the Bellerive Bluff. Can you remember when the extensive area of land on the eastern side between road and water was covered with blackberries, ivy and other unwanted plants and no one made much of a fuss about the dumping of garden waste on the foreshore? When no one cared much about the degradation of the Bluff or of its potential. Hardly an attractive or a user friendly place; not somewhere that you would add to a tourist route.

All that started to change as a consequence of a public meeting held at the old Bellerive Regatta Pavilion in 2000 which resulted in the formation of the Bellerive Bluff Land & Coast Care Group. Twelve years down the track this group can be justifiably proud of its contributions to the improvements so apparent. Twelve years of lobbying, negotiating, facilitating planning, applying for funding, collaborating, meetings a plenty, contracting and a lot of physical hard work.

Objectives of the Group

- ♦ To identify and preserve the heritage of the Bluff, both natural and historic
- ♦ To provide positive direction and guidance for new development in the area.
- ♦ To protect and enhance valued characteristics and amenities of the area.



Before & after photos

Following public consultation, the development of a 5 year Activity Plan, 2008-2013, with Clarence City Council ensured that a vision for the area and activities have been agreed.

Over the last twelve years, the Bellerive Bluff Land & Coast Care Group has conducted monthly working bees and volunteers have achieved an incredible amount assisted by the Adopt-A Patch program for families. This great idea allows participants to be able to do their bit in the area in their own time but with guidance and support. The regular newsletters have kept the community informed of its activities and plans as well as soliciting greater involvement – all up, 52 newsletters with a circulation of approximately 600, have been distributed during the group's lifetime.

In addition, the group has sought to involve other bodies in developing this magnificent area. A close working partnership with staff and students involved in Conservation and Land Management studies at the Clarence Polytechnic has evolved and Students from Mackillop College have been involved over a number of years and took ownership of developing a considerable length of the gardens bordering the multi-user pathway below Abbott St.

Some of the work achieved has included large scale projects such as the construction of a viewing platform and stairwell at Victoria Esplanade and stormwater and sediment control below the eastern end of King Street.



Stairwell at Victoria Esplanade



From modest beginnings of trying to get locals to take ownership and address the degradation of the Bellerive Bluff foreshore, this group has been successful in enhancing their own backyards and improving outcomes for visitors. The improved walking tracks offer wonderful views and now many people get to enjoy the beauty of the area. Kids and families have worked together clearing the weeds, planting out and watching with wonder as nature takes over and now we all get to enjoy that hard work.

For more information on the project or the group contact Graeme Rainbow. graeme.rainbow@bigpond.com

Story by Graeme Rainbow
Edited by Sue Sagewood

President's Winter and Annual Report

I would like to mention just some of our achievements for the year which I think have been fantastic. Last Spring we were delighted to receive the Nyrstar Community Achievers' Award in the Environmental category.

The work we are doing with schools is really great. This year we have been involved with Snug Primary School's Wild s'cool program, planning a forty-spotted pardalote habitat project with a small group of students; a tree planting project with South Arm Primary School and a future project is planned through the Southern Coastcare Association of Tasmania which will also involve working with more schools. These projects inform children of the importance of biodiversity in nature and the importance of an understorey.

Other projects of import have been our field trials on Bruny Island, in partnership with NRM South and Kingborough Council, working with private land owners to investigate optimum ways of encouraging regeneration of *Euc. viminalis*, vital habitat for the endangered Forty Spotted Pardalote. Growing thousands of plants this year has kept our volunteers at the Tolosa Nursery very busy. As well as supplying thousands of plants for projects, the Nursery has enabled us to run fund-raising plant sales. Our plant sales in April and July were very successful. All plants at the Nursery are now labeled. A special thanks to Anna for drawing up the electronic versions of the labels.

Thanks to the Tasmanian Landcare Association, the USN returned to Agfest this year with the intention of promoting the network statewide. We also had a stall at the Salamanca Market one Saturday morning and had a presence at Tread Lightly Envirofest at the Botanical Gardens, again sharing a stall with the TLCA.

Our coordinator Oliver has had a very busy year coordinating projects, putting in grant applications and facilitating activities for members which has included conducting many workshops state-wide. I would really like to take this opportunity to thank Oliver, for all his work and the success he has given to the USN. We look forward to him working full-time with us in the coming year.

I also want to thank all of our volunteers who have put so much time and effort into the USN. Without them we couldn't achieve our goals.

Thanks, too, to our committee for their input. As a group we work well and at the end of each meeting we have all had a very pleasant time and look forward to the next monthly meeting.

Warner Wait

Propagation Pointers

Family name:	Dilleniaceae
Species name:	<i>Hibbertia procumbens</i>
Common name:	Spreading Guinea-Flower
There are 14 species of <i>Hibbertia</i> growing throughout Australia. This one has a large, yellow flower 2.5cm in diameter and is widespread through Tasmania. From coastal heath to mountain plateaus. A low, prostrate plant that grows in exposed dry to moist areas. Tolerates shade, sun, windy positions and frost.	



Seed treatment	A difficult plant to grow from seed as seed matures quickly then drops. It is also affected by insects which burrow through the seed leaving few viable seeds. Flowers August—January. Collect seed Nov—Jan. Seed stored in cool, dry area can be kept for 2 years.
Propagation notes	Cuttings should strike easily if taken during March—April or August—September. May take 2 – 3 months to develop roots.
Seed sowing months	I suggest sowing during March. Germination should occur September to October

WHAT'S HAPPENING

Please call the office on 6234 4286 or email oliver@understorey-network.org.au for more information or to RSVP for any of the workshops. Also check the website for the latest Calendar of Events.

End of Season Native Plant Sale – Tolosa Nursery Fundraiser (South)

Come and choose from a wide variety of Tasmanian native plants in tubestock or 6 inch pots, starting from 50 cents each.

When: Every Monday in September, 10:00am to 1pm
Where: Tolosa Nursery, Tolosa Park, Glenorchy

Annual General Meeting

Understorey Network AGM and presentation by guest speaker Dr Magali Wright on orchids and the role of mycorrhizal fungi in ecological restoration.

When: Saturday 8th Sept. 2012, 10:30am to 12:00pm
Where: Royal Tasmanian Botanical Gardens, Hobart

Tree Planting and Fencing Working Bee (South)

Help protect and revegetate an area of the endangered *Eucalyptus morrisbyi*. (RSVP required)

When: Monday 17th September 2012
Where: Calverts Hill Nature Reserve, Sandford

Tree Planting Working Bee (North)

Help revegetate stream bank vegetation in forest near Notley Fern Gorge. (RSVP required)

When: Friday 28th September 2012
Where: Exeter, West Tamar

Propagation Workshop and Depot Day for Growers Scheme (North West)

How to propagate Tasmanian native plants from seed or cuttings + collect your materials for the growing season.

When: Saturday 29th September, 10:00am to 12:00pm
Where: Otto's Grotto, Bicentennial Park, Ulverstone

Propagation Workshop and Depot Day for Growers Scheme (South)

How to propagate Tasmanian native plants from seed or cuttings + collect your materials for the growing season.

When: Saturday 6th October, 1pm to 3pm (collection times to be advised in separate letter to growers)
Where: Tolosa Park, Glenorchy

Spring Community Festival (South)

The Understorey Network will be supporting NRM South with the launch of a new Native Garden Design booklet.

When: Saturday 6th and Sunday 7th October
Where: Royal Tasmanian Botanical Gardens, Hobart

Tolosa Nursery 5 year Birthday Celebration (South)

This October, it will be 5 years since the official opening of the Tolosa Community Nursery and Native Plant Display Garden. There will be a free BBQ lunch and other activities to celebrate the achievement of all those involved in the nursery. (RSVP required)

When: Monday 15th October, 12pm to 1:30pm
Where: Tolosa Park, Glenorchy

Depot Day for Growers Scheme (North)

Collect your materials for the growing season.

When: Saturday 27th October, (Times to be advised in separate letter to growers)

Where: Trevallyn, Launceston

Plant Identification and Seed Collecting Workshops x 3 (South)

Learn techniques to identify Tasmanian native species and collect seed to be used in local revegetation projects (Funded by NRM South)

When: Saturday 24th November
Where: Bruny Island Neck Game Reserve

When: Saturday 8th December

Where: Chauncy Vale Wildlife Sanctuary

Understorey Network Committee Meetings

When: The second Monday of every month, 5:15pm

Where: USN office, Level 1, 148 Elizabeth Street Hobart

All members are welcome to come to our regular meetings – please RSVP for catering purposes\



Native Plant Display Garden at Tolosa Park, Glenorchy

GROWERS SCHEME 2012/13

Not too late to register!

Thank you to everyone who has sent in membership renewal and growers scheme registration forms.

We have some great projects to grow for this year, including 40 spotted pardalote and swift parrot habitat on North Bruny Island, and providing linkages of native vegetation within the Midlands. We also have lots of volunteers offering to grow plants for other members. If you would like to participate in the scheme this year, either as a grower or a receiver it is not too late to register. If you require a form to be sent out contact the office.

Forms need to be received by the Understorey Network by Friday 21st of September.