

STEP Newsletter March 2017



From the President

Happy New Year to all STEPpers. I am grateful for your continued support as the tasks required to maintain and advance our regional botanic garden seem to grow exponentially.

The very wet Winter and Spring of 2016, followed by a very dry and hot Summer has seen an explosion of weeds which, through many weeks of hard labour, appears to be under control. The Arboretum had kindly given us a trailer for the disposal of weeds at their compost dump, but the volume of weeds has been such that we could fill the trailer several times over each Thursday.

The seedlings from last year's potting marathon were well established before it became too hot and the survival rates are encouraging. Unfortunately, a significant number of trees and shrubs succumbed to the boggy conditions. Jens Svensson and Terry Murphy will be heading up a group to discuss, among other issues, what replacement species we could consider.

Plans for a shelter structure are underway and discussions with the architect and the Arboretum are ongoing. An area has been pegged out near The Clearing so we can visualise the footprint of the structure and Lainie Shorthouse has made a model of it to give us a clearer understanding of the shelter's shape.

Also, a concept plan for a Bush Tucker Garden has been circulated. While there are still points to work through with design, plantings and maintenance of the space, the general feeling of STEPpers is that this will be a wonderful addition to our forest.

If you are free on 25 March between 10am and 4pm, STEP, in association with Friends of the National Arboretum, is setting up a display at the CAP (Connect and Participate) Expo at The Old Bus Depot Markets, Kingston. If you can assist, please email us at info@step.asn.au.

Tree Week this year will be from 1-7 May. Watch this space for the activities we will have on offer, or contact us if you have any suggestions.

Regards

Judy Smith

A shelter for STEP.

Plans have been underway for some time to have a shelter at STEP, adjacent to The Clearing. The purpose of this would be to accommodate display space for STEP information and events, give shelter from sun or rain, facilitate a space where information for conference or tour groups could be distributed, and provide public space amenity.



The images above are concept plans submitted by the architect who is working with the Arboretum. The long-term project is that other shelters built in the Arboretum would be of similar design, but possibly larger as required. The curved low walls are at present shown as gabions, but we are investigating if rammed earth might be another option.

On Wednesday 8 February, a group undertook the task of staking out the footprint of the structure as proposed in the concept plan.



Lainie Shorthouse constructed a model based on the plans which was very helpful for us to understand what is being proposed. *Photos by Lainie Shorthouse*



Whose scat is that? (Or is it a regurgitant?)



This interesting “remainder” was found under one of the Eucalypts. It is about 7cm in length. There was much discussion about whether it was a scat or a crop (regurgitant), and suggested culprits were a currawong or a fox. A close look shows that lots of Christmas beetles were consumed before the item was regurgitated or passed. If you have any suggestions, please email us at info@step.asn.au

Photo Jennie Widdowson

Leaves, flowers, reeds, and grasses

Botanists happily move from Greek to Latin and back again when classifying plants. They are also happy to use either a Greek term or a Latin term to describe the same phenomenon.

Leaves. The Greek *phyllon* (leaf) has a Latin cognate (*folia*). Leaves may be long (*makros* in Gk; *longus* in Latin) or small (*mikros* in Gk; *parvus* in Latin).

So: the bramble (in EE) is *Rubus parvifolius*; the *clematis* in C is also small-leaved—but in Greek--*microphylla*; as is the *olearia* in E. On the other hand, we have some long-leaved plants: *Lomandra longifolia* (C); *Dianella longifolia* (A and EE); and *Cassinia longifolia* in G.

Leaves may be described in other terms: *Hovea heterophylla* (H) has a varied leaf (*heteros* in Gk means ‘other’); *Pimelea linifolia* (H) has a flax-like leaf (*linum*=flax); the leaf of *Cheilanthes austrotenuifolia* (B) is slender (*tenuis*) and ‘southern’ (??) (*auster* refers to the south or the south wind).

Flowers. The Greek word is *anthos*; the Latin *flos* (with a stem *flor-*). So *Cheilanthes* (see above) has a flower with a lip (Gk. *cheil-*). Our Snow gum is *Eucalyptus pauciflora*: it has few flowers (*pauci*=few).

Reeds, rushes, and shoots. *Iuncus* (C) is the Latin for reed/rush; *chloa* is the Gk for young leaves or shoots (as in *Bothriochloa macra* (E): long shoots that grow in a ditch (*bothros* Gk)

Grass. *Poa* is Gk; *gramen* is Latin. We see the latter form in the descriptor meaning ‘grasslike’: *Hypericum gramineum* (G) and *Brachyscome graminea* (H).

Perhaps grass, *poa*, in ancient Greece was a different species from what we see at STEP: when Sappho in Poem 31 sees her beloved talking animatedly with a man, she becomes, she says, ‘greener than grass’.

Vocabulary

anthos	flower (Greek)	chloa	young shoots (Gk)
flos (flor-)	flower (Latin)	folia	leaf (L)
gramen grass (L)		iuncus	reed (L)
makros long (Gk)		mikros	small (Gk)

parvus	small (L)	pauci	few (L)
phyllon leaf (Gk)		poa	grass (Gk)

Elizabeth Minchin

STEP now hosts an Augmented Reality station in Forest 20

The Arboretum has installed a new method of interpreting its forests, and has included STEP in the initial roll-out. Deputy Chief Minister Yvette Berry MLA launched the new ‘alupanel’ signs on 5 December 2016 at the Himalayan cedars picnic deck.



STEP’s Augmented Reality station features Ngunnawal man, Glen Freeman, welcoming visitors to Ngunnawal country – see link below. When visitors scan the image on the sign (located near The Clearing) with their mobile or tablet (provided they have the free app downloaded) while standing at the sign, a hologram ‘comes alive’ and stands up from the sign with on the rock with the background image. *Photo Andy Russell*

<https://www.youtube.com/watch?v=XDFs4EF6LY&feature=youtu.be>

For more information about the Arboretum’s completed Augmented Reality program see

http://www.nationalarboretum.act.gov.au/visit/whats_on/whatson-full-story/new-augmented-reality-app-brings-national-arboretum-to-life

David Shorthouse

News from Forest 20

As reported in the December 2016 newsletter, we have had a difficult time managing the aftermath of the wet winter and spring. Continued flows of water from the carpark have kept some areas rather wetter than the trees like and we have ‘lost’ several Snow Gums, *Eucalyptus pauciflora* and rather more Red Stringybarks, *E. macrorhyncha*. We are now considering whether to replace like-with-like or to try different Eucalypt species in the vacant spots. Interestingly, we have some naturally regenerated Red Stringybarks growing near to those that have succumbed to the wet conditions, so we are hoping to allow some of these to grow on as replacements.

Weed growth, as any regular STEppers will attest to, has been phenomenal over the last 6 months. But we have persevered, and over several months of intense hand- weeding and some herbicide use we may have re-gained control, with the help of hot, dry weather which has suppressed growth. As a result of this experience we have started to draft a weed management strategy and program, that combines, hand-weeding, spraying of gravel paths, and the use of weed wands for individual weeds amongst the garden beds. Our working bees have undertaken some repair of sodden beds with more mulch and digging drainage channels. Clearly climate change, with different patterns of both wet and dry conditions will continue to be a challenge.

The hot and dry conditions since December have also had an impact on our major plantings with some species deciding that the conditions they are experiencing were too extreme. We are assessing

whether we should re-plant the species and whether this should be in the same or different position in the central garden. There are always new challenges as we continue to develop the regional botanic garden and strive to present a useful educational and interesting display.

The results of propagation activities last winter continue to yield dividends in terms of several areas of mass plantings that have flowered and provided a cheerful welcome to visitors as they enter Forest 20. The plantings have also given us new crops of seed that we will use to produce more plants.

STEP is in active discussion with the Arboretum management regarding a shelter to be associated with the clearing (see separate report) and a Bush Tucker Garden. We now have an indicative plan for this latter project that will be funded entirely by the Arboretum as part of the ACT government's reconciliation action plan. We need to consider the species of bush tucker that can be readily obtained, will grow well. We also need to align the plans with our Master Plan. When completed, the Arboretum will construct the paths, rock seats and arrange for plantings.

David Shorthouse

Visit by delegation from National Parks Department, Singapore.



In mid-February, STEP hosted a short visit to Forest 20 by a group from the Singapore National Parks Board (including their Botanic Gardens) who were looking at forest and landscape restoration in Canberra and Brisbane. Although circumstances had reduced the anticipated numbers, the tour of Forest 20 provided a stark contrast to the vegetation and climate in Singapore, although some common themes around the educational potential of our forest and understorey plantings were evident.

David Shorthouse talking to the Singapore visitors, Associate Professor Chris Brack (left) from the ANU Fenner School and STEP members. Photo Andy Russell

David Shorthouse

Support us by (tax deductible) donating at:

<https://www.arboretumcanberra.org.au/support-us/donate>

Specify STEP as a particular project.

The very hungry beetles

This week a friend and I went for a walk through the STEP site looking at the Eucalypts. My main interest was Candlebark, *Eucalyptus rubida*. I find Eucalyptus trees very difficult to identify because it seems to me there is so much variation between specimens. I have very little recollection of ever focussing on them while walking in the bush.

We had Christmas beetles landing on our balcony for a period of a month or so. We only have an unidentified blue gum species close by and when I heard about the damage done to the STEP Candlebark by the Christmas Beetles I thought now was the time to look at the trees more closely.

We could see that the tops of the STEP trees had had a set-back but there was a flush of new growth and the trees are looking well. This was not how the trees looked like a month earlier. The reason for this was the activities of Christmas Beetles.



Candlebark stripped of leaves Jan 2017

Two different species of Christmas Beetles have been identified at STEP, Emerald Tip Beetle, *Anoplognathus chloropyrus* and the Duck Billed Beetle, *Anoplognathus montanus*.



Juvenile leaves February 2017



Mature leaves February 2017



Close-up showing eaten leaves Feb 17



Emerald Tip Beetle 1

I found an excellent website belonging to the Australian Museum that shows twelve of the Christmas Beetles of NSW with pictures of back and front views as well as the species' key ID feature.

I was surprised to find that there are 21 species in all in NSW. Christmas Beetle adults feed on eucalyptus leaves and the larvae feed on grasses. You would think that the larvae must have adapted to exotic grasses as these days native grasses are at a premium. It seems that STEP has set up an excellent ecosystem fit for the Christmas Beetle.

Janet Russell

Photos by Janet and Andy Russell

Wasps at STEP

Over the summer, many insect species have been sighted in the trees and shrubs that have been flowering at STEP. At least 7 species of solitary wasps have been identified and although they appear quite attractive and are relatively harmless to people, they all have some gruesome habits in their life cycle.

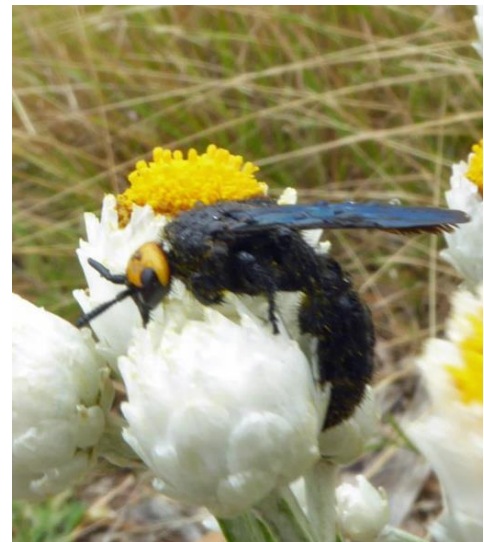
There have been 3 species of flower wasps seen at STEP recently. The blue black Hairy flower wasps, *Austroscolia soror* and the Smooth flower wasps *Tiphidae sp.* were observed in the Prickly Tea-tree, *Leptospermum continentale*, the Blackthorn, *Bursaria spinosa* and the Red Stringybark, *Eucalyptus macroryncha* as each one came into flower. The Yellow headed hairy flower wasp *Scolia verticalis* was found on the Winged Everlasting *Ammobium alatum*.

Potter wasps *Eumeninae sp.* were seen in the Blue devils, *Eryngium ovinum* and the *bursaria* and an Orchid dupe wasp *Lissosimpla excelsor* in the *Leptospermum continentale*. Spider wasps *Cryptocheilus sp.* were also seen on the *Leptospermum continentale* and on the Barnyard grass, *Echinochloa crus-galli* that was being cleared. Another species of Spider wasp *Pompilidae sp.* was observed in the Red Stringybark, *E. macroryncha*. There was also an Orchid dupe wasp *Lissopimpla excelsor* in the *Leptospermum*.

Flower wasps

The Hairy flower wasp occurs throughout most of Australia. It is a solitary wasp that can sting, but it is not generally aggressive. Its body is 1-3cm long and black in colour. It has metallic blue-purple wings, short antennae and hairy legs. These wasps drink nectar to provide them with the sugar needed by their wing muscles for flying.

The females find Christmas beetle grubs by digging in the earth or mulch. They sting the grub to paralyse it, but not kill it. She then lays an egg in the paralysed grub so that the wasp larva is provided with food when it hatches. The male wasp dies shortly after mating



Hairy flower wasps

photo by Andy Russell

The smooth flower wasp is a small to medium sized nectar feeding wasp with a slender black or dark brown body. The females are smaller than the males and often wingless. Mating time may be lengthy and males can be seen carrying the wingless females between flowers while mating, remaining attached tail to tail. The female burrows for beetle larvae which are parasitized to feed the larvae.



Smooth flower wasps

Spider wasps

The spider wasps are large solitary wasps with long spiny orange or black legs and black or dark blue bodies. Their wings are large and may be orange or black. The females are larger than the males. These wasps hunt and catch spiders to be used as a host for their larvae. The spider paralyzes the spider with its sting and then drags it to the site of its nest (usually a hole in the ground). A single egg is laid in the abdomen of the spider and the nest or burrow is closed. The wasp protects the nest site by placing dead ants around the outer part of the nest. Chemicals given off by the ants deter predators. The size of the spider host can determine whether the larva becomes a male or female. Large hosts tend to produce females. When the egg hatches, the wasp larva feeds on the spider (which is still alive) consuming all the useful edible parts, leaving the heart and central nervous system until last to ensure the spider stays alive as long as possible. The larva then spins a cocoon and pupates, emerging as an adult in the following year. Wolf spiders and huntsmen spiders are the main prey.



Spider Wasps

Orchid dupe wasp

This wasp belongs to the ichneumon family of solitary wasps. It is a medium sized wasp with an orange body and dark wings. The females have an ovipositor which is half their body length. The wasp gets its name from the fact that it mistakes a species of orchid (*Cryptostylis* orchids) as a female wasp and tries to copulate with it, thus fertilising the orchid. Female wasps locate the plant species of the host to be used as food for their larvae and then locates a suitable host using their antennae. Hosts for this wasp are leaf rolling or stem boring caterpillars. Their long ovipositor is used to insert eggs into the paralysed host, providing food for the larva.



Orchid dupe wasp

Potter wasp

This is a brown or black solitary wasp with patterns of red or orange on its body. It feeds on nectar. The female wasps build nests in holes and divide them into a number of cells using mud made by mixing soil with regurgitated water. The mud may also contain chewed plant material. The name potter comes from the shape of the nest which looks like Native American pottery. A single egg is laid in each cell and beetle larvae, spiders or caterpillars are paralysed and placed in the nest cells as food for the wasp larvae.



Photo by Andy Russell



Potter wasps

Wasp-mimic bee

This bee disguises itself as a black and orange wasp and even holds its wings like a wasp to try to be less attractive to predators. It builds nests in tree stumps, logs or fallen trees and makes a cellophane-like curtain to protect the entrance. Within the nest, it builds a number of cells that are provisioned with honey or nectar for the young to eat. Once the eggs are laid, the nest is sealed up completely. When the young are fully grown, they eat their way out. This species of bee was first discovered during Captain Cook's voyage in 1770.



Wasp-mimic bee

Photo by Andy Russell

Although the life cycle of all these wasps seems rather grizzly, they are welcomed by farmers as they provide a natural means of insect control.

Article and Photos by Jenny Widdowson, except where photos are attributed to Andy Russell

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Contributions for the next newsletter should be submitted by mid-May to membership@step.asn.au