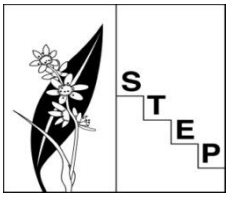

SOUTHERN TABLELANDS ECOSYSTEMS PARK-A REGIONAL BOTANIC GARDEN, EDUCATION AND ECOSYSTEMS RECOVERY FOR THE SOUTHERN TABLELANDS.

NEWSLETTER: June 2015.

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MESSAGE FROM THE PRESIDENT

As I am writing this during National Volunteer Week (11-17May), I would like to acknowledge the enormous contribution of our STEP volunteers. For example, it was with great satisfaction that our faithful group of Thursday morning workers, on 14th May ,celebrated the completion of mulching our central area gardens. It is well over a year since we started to mulch the whole central area of 3x3 metre squares which showcase the understorey plants common in the Southern Tablelands. The Thursday group are responsible for the maintenance of Forest 20, our site at the National Arboretum Canberra. Our tasks range from weeding, spraying out weeds, watering, planting, measuring tree growth, repairing water and pig damage, constructing paths, and helping to build The Clearing, our outdoor education space .I would estimate that on an average Thursday morning volunteers provide the equivalent free labour of one paid employee's work hours for a week.

Our volunteers also guide groups who visit Forest 20, and are able to explain the concept of a regional botanic garden, discuss suitable plants for local house owners to plant, and describe what we have achieved since the first plantings in 2009.

We also have volunteers who perform administrative roles on the STEP Committee, who edit this newsletter, and maintain our website.

Thank you everyone, your involvement is greatly appreciated.

Margie Bourke

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Forest 20 news.

In mid- May the Thursday STEPpers achieved a major goal for 2015 – completing mulching the central garden. Gravel paths now edge three sidess of the area that is being planted with the understorey plants. Finishing the gravel path edge will be a key part of our work over the next few months.

STEPpers celebrating the completion of mulching the central garden

Planting understorey species continues apace, with welcome and generous supplies from local growers. Our annual inventory of what has been planted and where, reveals that we have reached 150 species, many planted in several squares. The dry sclerophyll forest and grassy woodland areas are filling fast and demonstrate the value of the master plan's design for 3 x 3m squares of massed plants. The areas that will demonstrate montane vegetation are lagging behind due to the failure of the alpine ash trees (now replaced with narrow-leaved peppermint (*Eucalyptus radiata*) and the need to develop a more shady environment.

Thursday STEPpers have been active in working on the ephemeral wetland. Edge planting and some small trees (*Casuarina littoralis*) have been planted, weeding and general tidying up make the area more attractive and looked after.

We are looking forward to Forest 20 being included in the Arboretum's work to complete a circular path linking the Village Centre, events terrace, carparks and some forests that are adjacent to these destinations. Forest 20 is included, and the path will lead visitors to The Clearing, the central garden and the carparks. Initially the path will be at grade and with a mineral earth surface, perhaps not completely accessible for all abilities, but at least accessible for strollers and it will bring more visitors to what we can now claim to be a Regional Botanic Garden for the Southern Tablelands.

David Shorthouse

Visitors to STEP

Since our last newsletter STEP has hosted several visitors, including the Duke of Kent, indigenous teachers keen to see plants of significance to aboriginal people, volunteers with Greening Australia

as part of celebrating National Volunteers Week, and indigenous staff from ACT Government and Greening Australia to discuss plans for linking STEP with Aboriginal groups interested in local plants.

We were particularly pleased to be asked to be part of the private visit by the Duke of Kent to the arboretum as this demonstrates the extent to which Forest 20 has become a destination worth visiting – Southern Tablelands Regional Botanic Gardens.

Barbara Payne explains the STEP master plan to the Duke of Kent, Jocelyn Plovits (Chair, Friends of the Arboretum) and David Shorthouse (STEP)

Visit from Greening Australia

On Thursday 23 April, representatives from Greening Australia – Bindi Vanzella Adam Schipp and Darren Chong (ACT Aboriginal NRM Facilitator) visited to investigate the ways in which STEP and GA could work together on a range of projects. Accompanied by David and Barbara they viewed the Clearing plantings and the wetlands.

Darren had earlier brought the Winnunga Mens' Group to STEP and he indicated they were keen to utilise the indigenous plantings as a way to re-start the cycle of passing on knowledge about native foods and fibres to younger people.

Other possible ventures discussed could include: bringing school groups to demonstrate edible native plants (the obvious advantage being that these plants are all in a small, accessible space); relating the STEP plantings to the adjacent woodlands block; demonstrating grinding techniques for seeds and tools; utilising the fibre plants to involve women's groups learning about and demonstrating weaving with natural fibres; canoe making and scar recovery; and using signage with local language names to explain uses to which plants could be put.

Bindi informed us that the Green Army was a very enthusiastic, hard-working group who could be used to help with tasks such as preparation of the new pathways prior to laying crushed granite..

Bindi also said that GA was in the process of turning over their seed beds and that there could be free seedlings (for example Chocolate and Bulbine lilies) available for STEP if we could dig them up and transplant them.

Barbara Payne, Darren Chong, Adam Schipp and David Shorthouse viewing the indigenous planting at The Clearing. (Photo: Bindi Vanzella)

When is Knotweed not a weed?

On Thursday 2 April, Margaret Ning visited the STEP (see photo). She is an acknowledged expert in the identification of plants and one of the movers behind the ecosystems project. She and David wandered through the plantings, checking the taxonomy shown on our signs.

Morning tea with visitors – Scott Sadler (NAC Operations Manager) and Margaret Ning

It is invaluable to be able to benefit from her expertise, especially as we will be hosting representatives from the Australian Native Plants Society during their conference in November.

In the course of rambling through the block, Margaret noted that some "weeds" which we have been assiduously digging out are in fact native species which could be left in situ.

Some of the species which have fallen under the hammer (or the trowel, the mattock or the hoe) are the eponymously named Knotweed – (Persicaria prostrata), Rough raspweed - Haloragis heterophylla, Hyssop loosestrife - Lythrum hyssopifolia, and Small crumbweed - Dysphania pumilio. All these species tend to creep along the ground or form low growing mounds. They have tiny inconspicuous flowers and are easy to mistake as a weed.

Jennie Widdowson spent some valuable time with Margaret after morning tea identifying and photographing the “not weeds” and Knotweeds for our future reference.

Dysphania pumilio (Small Crumbweed – close up)

Dysphania pumilio – (Small Crumbweed)

Haloragis heterophylla (Rough Raspweed)

Lythrum hyssopfolium (Hyssop Loosestrife)

Persicaria prostrata (Slender Knotweed) (Photos: Jennie Widdowson)

A New Face at NAC

Scott Sadler came to visit STEP on 2 April (see photo in article on Knotweeds). As the new Operations Manager at NAC, he comes with a wealth of expertise. His background is in Parks and Gardens administration, and he worked in Townsville and Rockhampton prior to coming to the ACT. (He assured us he was not worried about the cold of Canberra as he was originally from Wagga.) In his role at the NAC, he is in charge of events, services, and a host of special considerations including STEP.

He was very impressed by the plantings and development achieved by STEP members and expressed a desire to assist us in whatever way possible. Richard Jones asked about the possibility of another tank to assist us with our watering and Scott said there were two spare tanks at the depot and it would not be very difficult to move another tank next to our existing one. (The tank has subsequently been delivered.)

It was interesting to hear about the plans for future. He indicated that this year, Forests 104 to the 60s would be connected to valves for automatic irrigation. This is Stage 5 of the Water Plan and that unused tanks would be up for auction once this stage had been completed. Stage 6 comprises automatic irrigation for the remainder of the Arboretum and it may be possible for Forest 20 to be part of this reticulation.

An ongoing project was the identification of weed species.

Scott said the loop path from the Village Centre through STEP was expected to be completed before 30 June and that he was aware of the drainage problems as a result of water from the temporary car park. A few days previously, a bobcat had removed silt from the drainage areas.

Scott reiterated his willingness to assist us in any way possible and David invited him to join us for morning tea any Thursday when he had some free time.

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What's under the soil at STEP?

Have you ever wondered what lies under the soil at STEP and where all the rocks that are lying around came from? Look to the north and you will see Mount Painter. This is where the rock at STEP came from.

About 428 million year ago (mya) there were no trees and no land animals, not even dinosaurs and no Black Mountain. There was a warm sea where the centre of Canberra is now with coral reefs and the only life (as shown from fossil evidence) would have been fan worms (crinoids) waving in the currents and trilobites (which looked very like large wood lice) crawling on the sea bottom. This warm sea was ultimately the source of the limestone deposits found in Canberra under the foundations of the city buildings and was responsible for the Canberra area being described as the limestone plains by the early settlers.

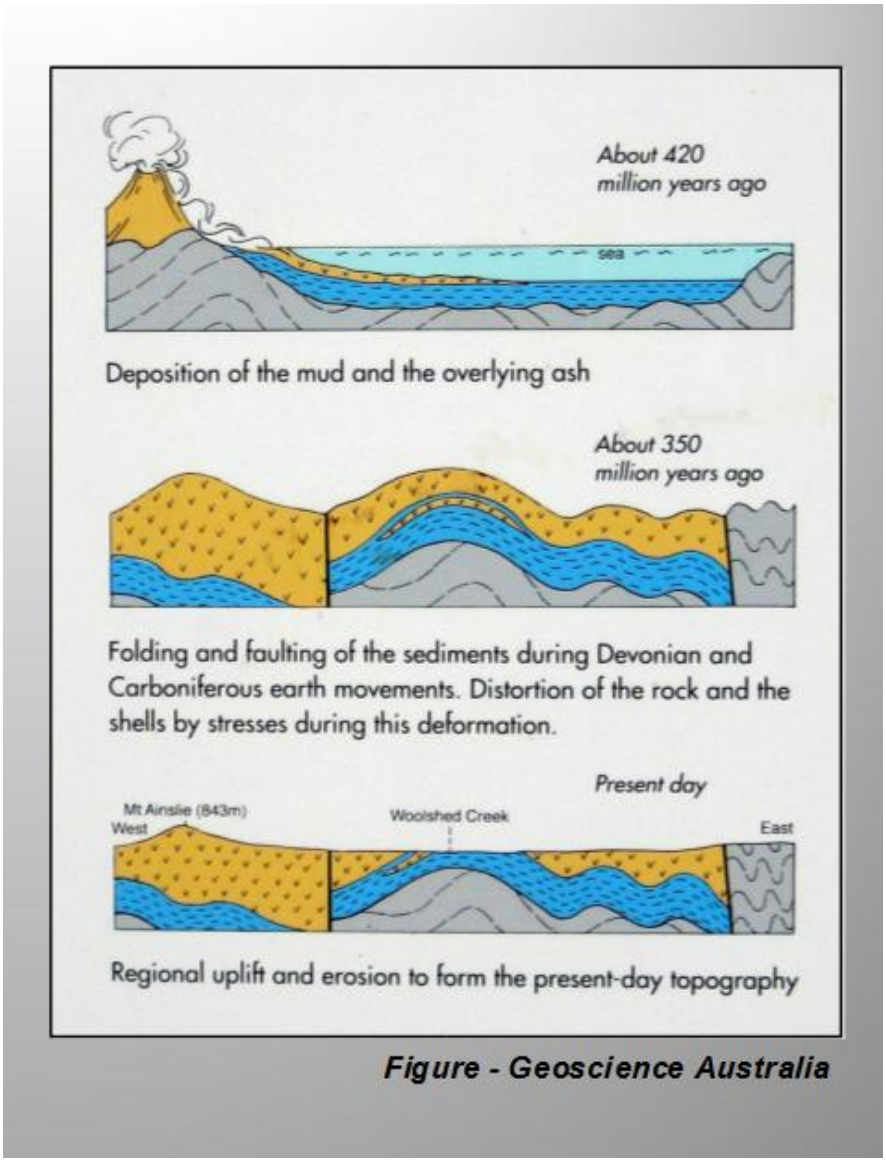
Running approximately north-south through the centre of Canberra was a rift formation. There were a number of crustal weaknesses in this rift and this allowed the molten lava deep beneath the crust to force its way to the surface producing a number of volcanic formations. Mount Ainslie and Mount Majura were produced in this way (between 428 and 425 mya). Next the Mount Painter volcano started to erupt violently (about 424 mya) throwing hot magma into the air which fell to the ground producing a fairly fast flowing lava. Explosions from escaping gases ripped away pieces of rock from the volcanic vent and injected ash and gas into the lava.

The lava from Mount Painter seems to have flowed some distance, across the site of the arboretum and into the sea. The same lava flow can be traced right across the Canberra basin shown by the fact that there are some similar volcanic rocks that outcrop at Narrabundah.

This is the sort of landscape you might have seen 420 mya in the early Silurian period.

Lava varies in composition depending on where the molten rock comes from. Basalt is the most common volcanic rock and is produced when lava wells up from the earth's mantle. It is very fast moving and cools to form a dark coloured, fine grained, heavy rock. It does not usually contain quartz. At the other end of the scale is rhyolite which comes from acidic (high in SiO2) lava. The lava is rather sticky and slow moving, light in colour, with quite large quantities of quartz and is produced when areas deep under continents become molten. The solidified rock can look like a fine grained granite. The rocks at STEP are composed of dacite which is about half way in composition between basalt and rhyolite and is produced when the lowest edges of continents become molten. Because the lava was exploded violently, the rock produced is known as a dacitic ignimbrite.

Following the volcanic activity in the Silurian period, the sea receded as the land was pushed upwards by tectonic activity. Faults formed along the boundaries of the current Black Mountain and the northern perimeter of Lake Burley Griffin to create Black Mountain as we now know it, by block faulting. Then followed a long period of erosion from wind, water, heat and cold resulting in the topography we see today.



This diagram shows a section from Mount Ainslie, but it would be similar for Mount Painter. Rocks in yellow are lava flows and those in blue are sedimentary.

Composition of the rocks at STEP

The rocks at STEP are dacitic ignimbrite, from the Mount Painter volcanics. This is a dark, bluish grey fine-grained igneous rock which weathers to a reddish brown colour. It is a relatively heavy rock. There are large numerous pieces of the rock at STEP.

The crystals that can be seen in the dacite rock are quartz (glassy crystals), feldspar (pink or white crystals) and horneblende (small dark crystals). Occasionally, there is a small amount of biotite mica (flatish black crystals). The rock has been described as an ignimbrite because there is evidence in the rock to show that the lava was originally a hot suspension of particles and gases which were explosively expelled from the volcanic chamber. In some rocks it is possible to see a tuffaceous form of the rock where the volcanic gases have produced a frothy looking form of the rock. In other pieces of rock, large crystals of quartz and plagioclase can be seen embedded in the finer rock

matrix. These are called *phenocrysts* and are the first crystals to form as the lava slowly cools. As well as these large crystals, there may also be some pieces of older pre-existing rock that have become embedded in the lava by being picked up as the lava flowed over the ground or were torn from the volcanic vent. These are known as *lithic xenoliths*.

Examples of dacitic ignimbrite from STEP (lithic xenocrysts in the left hand picture and quartz phenocrysts in the right hand picture)

Soil at STEP

As the rocks are eroded, the minerals break down from the effects of heat, cold, wind and water to eventually produce soils which are mainly slightly acidic sandy clays or sandy loams. The iron from the horneblende in the dacite has oxidised to ferrous oxide producing the red colour in the soils. The soil cover varies depending on the amount of erosion that has taken place and the steepness of the site.

Examples of dacite weathering in the soil at STEP

For further information:

Finlayson, D. M., 2008. *A Geological guide to the Canberra region and Namadgi national park*, Geological Society of Canberra (ACT division)

Jennie Widdowson

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Daisies at Forest 20 (Part Two)

As described in our last Newsletter Forest 20 has about 15 different daisy species planted.

On the main path in Section H is a small display of the yellow flowered *Chrysocephalum apiculatum a* low perennial herb and is said to be attractive to the Australian Painted Lady butterfly. Where the path turns to the west is more of this species. Nearby surrounded by a stone edge is another yellow flowered perennial herb *Coronidium rutidolepsis* (previously called *Helichrysum rutidolepis*). It is completed its flowering season. At the southern end of section H there has been a triangle planted of *Microseris lanceolata* known as Murrnong or the Yam Daisy. Although considered a perennial they may not be evident at present.

Pictured above *Chrysocephalum apiculatum* left and centre, with *Coronidium rutidolepis* on right

In section G there is just the one daisy species which is the sticky aromatic woody shrub *Cassinia longifolia.* This is sometimes called Cauliflower Bush referring to the compact white flower heads. Further south in section D is the related species *Cassinia quinquefaria* which has light yellow flower heads that are more dispersed. Both these species can grow to a height of two metres. In section B there is more of *Cassinia quinquefaria* and also *Cassinia arcuata* sometimes known as Sifton Bush, Chinese Scrub or Drooping Cassinia. In this section the yellow flowered herb *Craspedia variabilis,* Billy Buttons has been planted and is not flowering at present. *Calotis glandulosa,* Mauve Burr-daisy pictured on the left, is planted at the north

end of section C adjacent to the cross path. It is a low herb that flowered in December-January.

Three *Cassinia species,* left is *longifolia,* centre *quinquefaria* and right *arcuata.*

There are at least three volunteer members of the Asteraceae family growing at Forest 20. The best known of these *Helichrysum luteoalbum*, Jersey Cudweed is an erect herb with pale yellow flowers often found on the edge of our paths. Another is *Senecio quadridentatus*, Cotton Fireweed found near the ephemeral pond. The third is another Cudweed *Euchiton sphaericus*. A number of the weeds that we have to deal with are also of the daisy family. These include *Hypochaeris radicata* Flat Weed, *Conyza bonariensis* Fleabane, and *Cirsium vulgare* Spear Thistle.

Above the two Cudweed species, left *Euchiton sphaericus* right *Helichrysum luteoalbum.*

Text and photos by Andy Russell

Book Shelf

Two recent books of direct interest to STEP members.

1. *Australian Plants for Canberra Gardens, ANPS 2015*. This is the 5th Edition of this wonderful work and takes it to an altogether new level, so even if you have earlier editions, as I do, this is a must buy. Huge congratulations to the team who worked for years to make this happen and to ANPS. Available at NAC and ANBG bookshops.
2. *Land of Sweeping Plains – Managing and restoring the native grasslands of south-eastern Australia, CSIRO, 2015.* A rich compendium of work on grasslands in our region and elsewhere, history, science and management, a compelling read. Available ANBG bookshop.

Max Bourke

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