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Australian Native Plants Association (Australia)

Banksia Study Group Newsletter

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IN THIS ISSUE

Banksia Farm in media spotlight.

Banksia Farm's unique arboretum was featured earlier this year in an Australian Geographic article. The farm remains the world's only complete arboretum of species although a few other members have large collections. The last addition to the Collins's arboretum back in 2015 was B. vincentia which is growing slowly and yet to flower.

Hover over link...Ctrl & click.

http://www.australiangeographic.com.au/topics/wildlife/2018/02/western-australias-banksia-farm

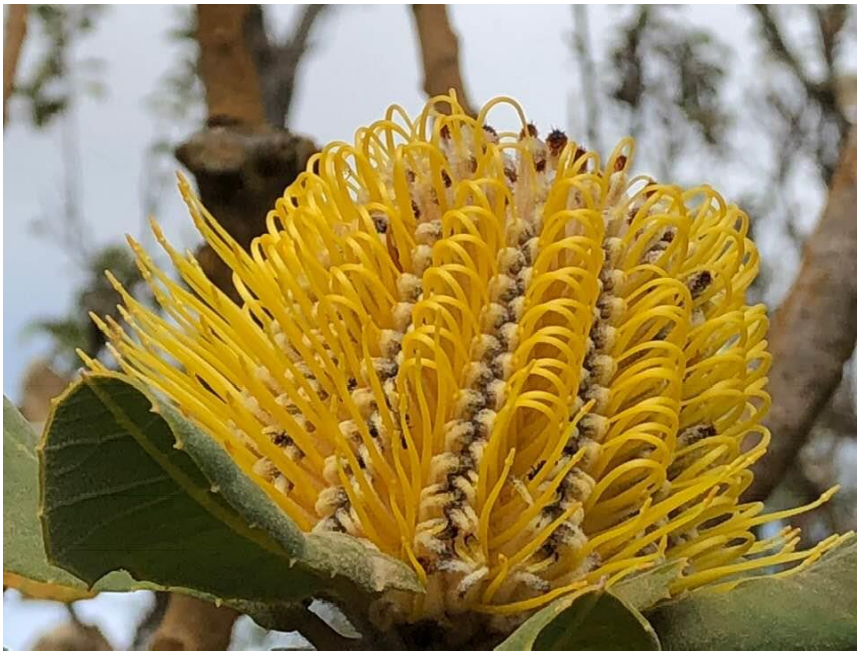
B. coccinea colour forms and efforts to grow these.

Everyone is very familiar with the normal dark red or orange/red flowered forms of B. coccinea. The yellow and orange/yellow or gold forms occur spasmodically in the wild and rarely pop up in floriculture plantations.

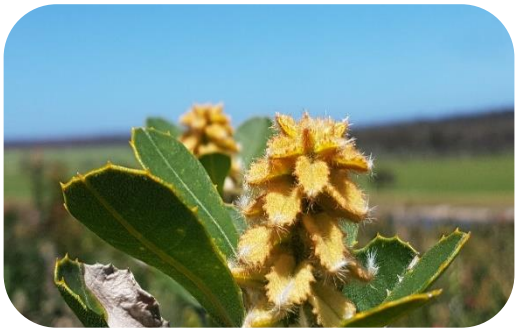
A delightful golden orange button flowered form was brought to our attention in a floriculture plantation at Redmond near Albany in southern Western Australia. This sole plant has been treasured by the owners for many years and attempts are now being made to grow it from cuttings and to graft it onto B. serrata root stock. The plantation has dieback infection and the plant is at risk. The Buxton family hope we can grow more to save this great coccinea colour form. It is anticipated that "Buxton's Beauty" will be included in the new banksia gardens in the National Botanic Gardens in Canberra.

One member, Phil Trickett, has successfully grafted a red flowered coccinea onto B. serrata two years ago. It is thriving and has shown no compatibility issues to date. He will now endeavour to graft Buxton's Beauty.

Another yellow flowered plant discovered some years back grows on Gull Rock Road, Albany. It is in very poor health and may die next year. Some seeds were collected from this plant three years ago and we have nine seedlings established in our arboretum. Time will tell if any progeny flower true to colour form. Most likely, as they were pollinated by surrounding red flowered plants, they will flower orange or red. If self-pollination on the plant occurred, we may get a yellow flowered one.



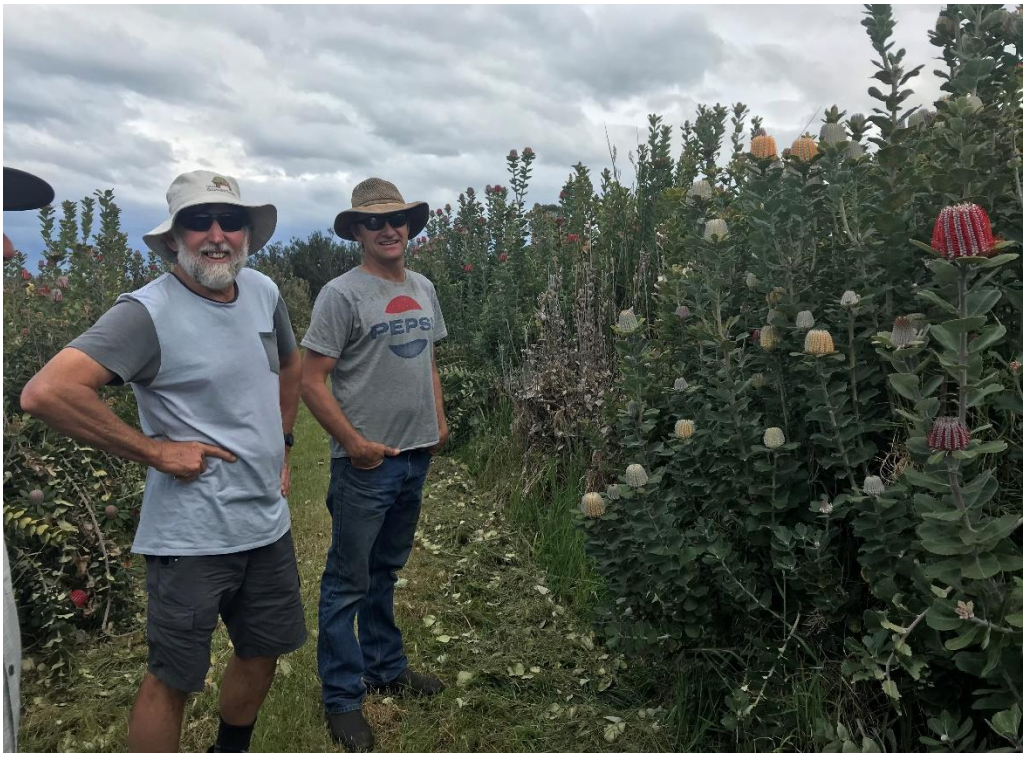
B. coccinea (yellow) Gull Rock Rd., Albany. W.A.



Top of inflorescense.

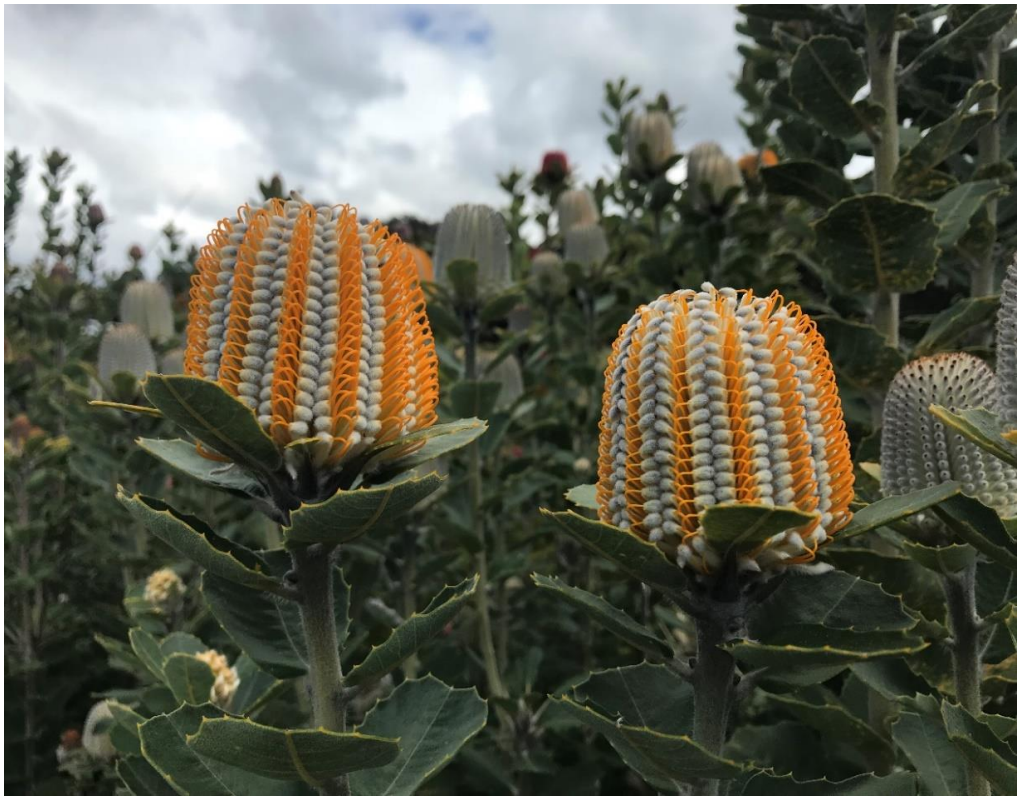
Four pictures of Buxton's Beauty. The new foliage is also gold whereas red flowered coccineas have pinkish or silver new foliage. 2018.

K. & K. Collins.



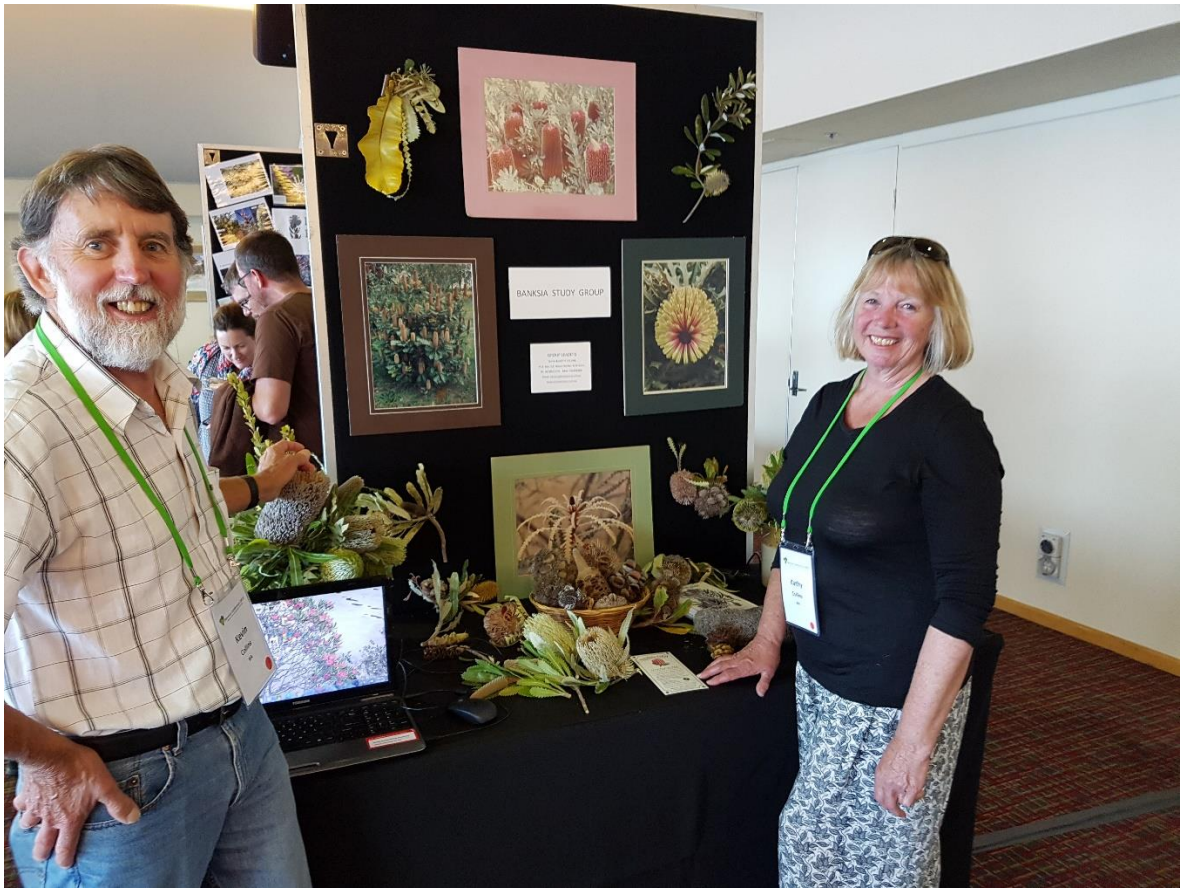
Buxton Beauty growing in plantation amongst red flowered plants. 2017.

Kevin Collins (LHS) & Andrew Buxton.



Buxton Beauty with smaller than normal golden orange button flowers. 2017.

Banksia Study group at Hobart bi-annual Conference. Jan. 2018.



Kathy and I were delighted to attend the conference in Hobart in January and to participate with the study group display. We wish to again sincerely thank all involved with assistance for our display. We were unable, due to quarantine regulations, to take our usual display cones, fresh flowers etc. Some helpful Tasmanian branch members came to the fore with much appreciated fresh flowers and seed cones.

It was enlightening to meet some of our eastern study group members and to mingle with wildflower enthusiasts. We thoroughly enjoyed our first conference and admired the wonderful range of guest speakers and the professionalism of the conference proceedings. Well done, Tasmania.

It is Western Australia's turn to host the next conference. This will be hosted by the Wildflower Society of Western Australia and held in Albany in the Great South in September/ October 2019 This will be a treat for delegates as the surrounding national parks are acclaimed biodiversity hotspots.

The southern mallee and heath coastal regions are proteaceae rich.

The Stirling Range, Fitzgerald and Cape le Grande National Parks abound with species found nowhere else in the world.

It is a chance for banksia study group members to opt in and nominate the Denmark-Mount Barker-Tenterden day tour, during the conference, as patrons get the opportunity to visit Banksia Farm's complete arboretum of species.

Should you have already made your selection spaces are available for the Mount Barker day trips so you should be able to change.

K. & K Collins.

England and Western Europe botany trip 2018.

Kathy and I travelled on a mega overseas trip in late May, June and July for 10 weeks visiting many famous botanic gardens and liaising with botanists, gardeners and nurserymen.

We were helped in our planning schedule by Chair of the UK/Western Europe "Australian Native Plants Society", Robbie Blackhall-Miles, who is a very keen proteaceae enthusiast and banksia lover.

We were honoured to give talks to staff members, botanists and others at many famous gardens; Kew Gardens, The Eden project, National Botanic Gardens of Wales, Tresco Abbey Gardens (on the Isles of Scilly), Jardin de Roscoff (northwest coast of France), Linnaean Society in Lyons, Tim Darrington's private garden in Vienne containing the national Banksia collection of France, Bonn Botanic Gardens (Germany), Liesbeth Uijtewaal's private open gardens in Neer (southern Netherlands) and Cambridge University gardens.

Other highlights were; attending the Chelsea Flower Show, seeing Robbie and Ben's private collections (llanberis-Wales), being shown through the Millennium Seed Bank and Kew herbarium (banksia and dryandra focused!), visiting the public garden of Australian native plants at

Bormes les Mimosa and enjoying Monet's Garden (both in France) and Judy Clarkes (private garden) at Hastings.

We will be running a series of articles reporting on growing techniques, successes and difficulties and listing species growing at the various gardens visited in southern UK and Western Europe in coming issues.

K & K Collins.

Esperance tour for ANPSA conference 2019

Kathy and I volunteered to be the post-conference guides for this excursion.

The six-day excursion takes in mallee & heathland plant communities in the coastal strip from Albany to Esperance and return.

It is a proteaceae-rich area, as is much of southern WA.

Day 1: We travel to Bremer Bay with a brief stop at Wellstead before going to Quaalup Homestead, a private holding within the Fitzgerald National Park (FNP). This will be our first glimpse of the stunning Royal hakeas, *Hakea victoriae*. Here we have lunch and do some great local walk trails. After driving to Bremer Bay and an afternoon walk along the new Snail Trail and viewing the inlet mouth, we will retire to our Bremer Bay accommodation.

(The Fitzgerald National Park will be visited from both eastern and western ends.)

Day 2: From Bremer Bay to West Mount Barren (weather permitting) or Swamp road, then onto Jerramungup and lunch roadside at West River Road wheat bin.

Then inland from Ravensthorpe to Roe Hill in the Pallarup Reserve taking in stunning Verticordias, many Goodeniacea and Dryandras. We retire to Hopetoun that evening.

The next morning, **Day 3**, we take in the fascinating Ravensthorpe range at Archers lookout before heading east to Esperance with a stop at Quagi Beach on the way. Forests of Banksia speciosa can be seen here as well as the most eastern location of Dryandra longifolia ssp. calcicola and other wind evolved species.

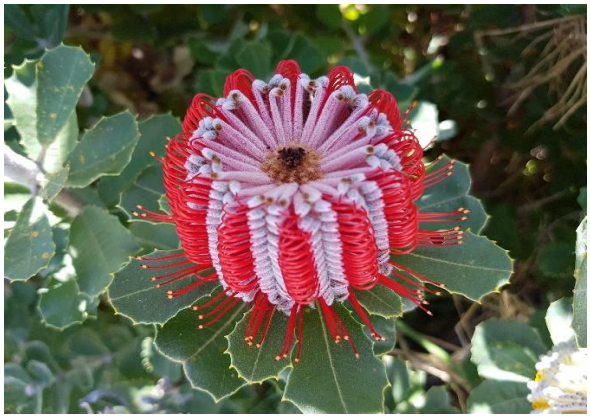
Then two nights in Esperance. **Day 4,** we visit Rotary lookout before heading to Cape Legrande National Park. We visit Frenchman's Cap on the way to Lucky Bay. Fitter patrons can do the scenic Thistle Cove coastal walk to meet up with the other passengers at Lucky Bay.

Day 5: We depart for Hopetoun via The Pink lake with a stop at a revegetation site at Lake Monjingup. The afternoon is spent in the FNP with stops at West Beach then Regelia lookout before retiring back to Hopetoun.

Day 6: Our final day, via Jerramungup, is spent visiting Bush Heritage sites near Boxwood Hills. We travel to Eddy & Donna Wajon's "Chingarrup" then on to "Red Mort", a new complex, for lunch and a talk before heading for a brief stop at Pallinup River then back to Albany.

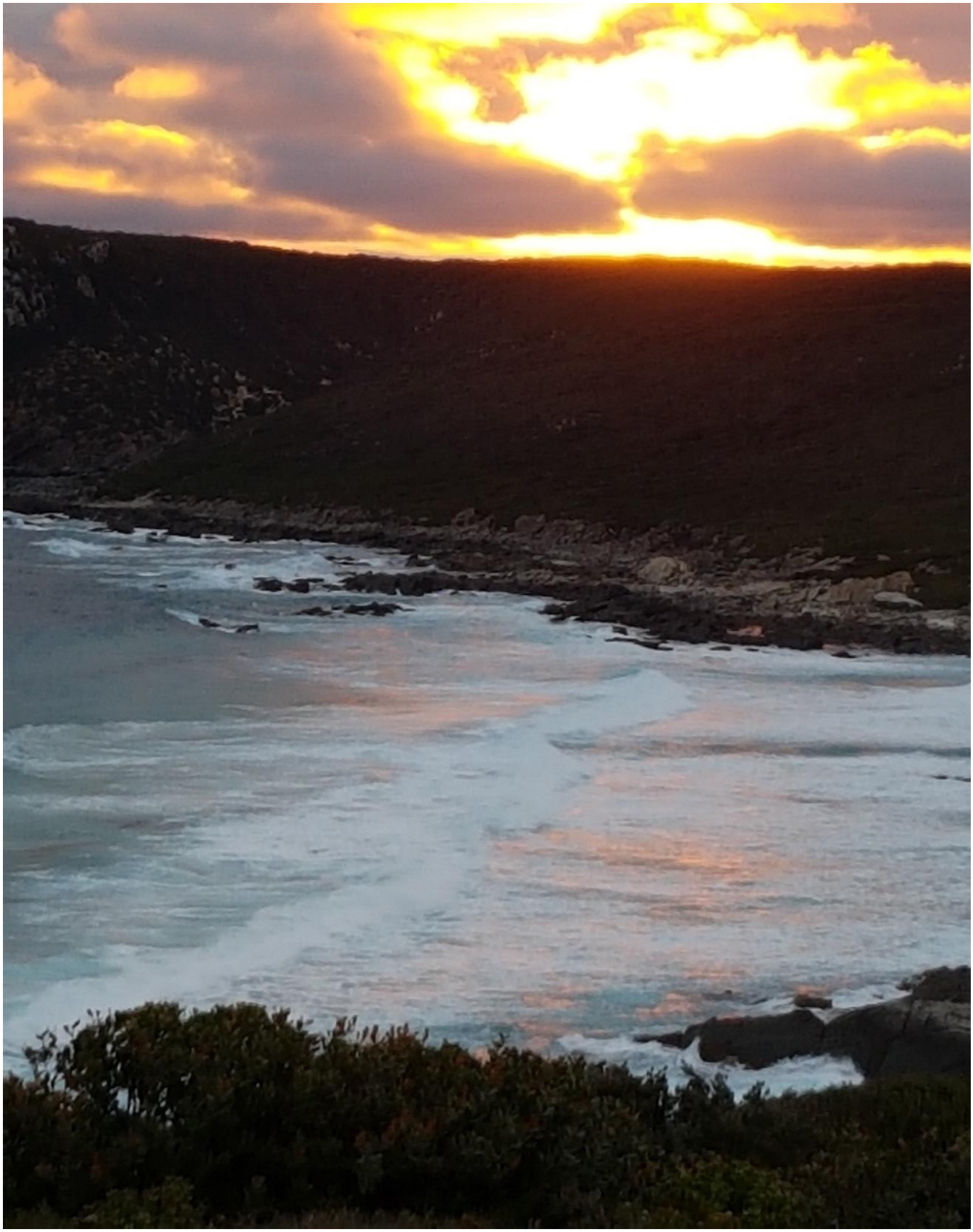
Along with proteaceae we will see some stunning coastal vistas and examples of wind evolved coastal heath vegetation.

A few pictures to whet your appetite.

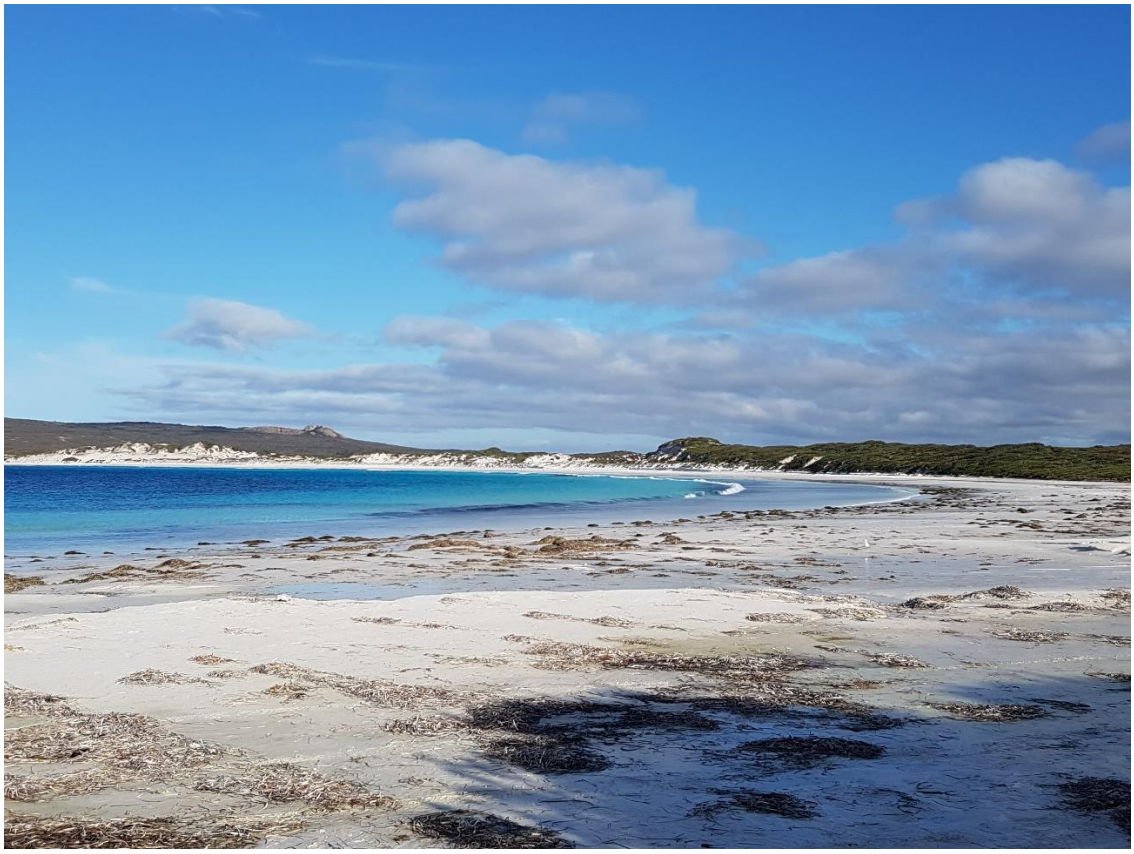


B. coccinea.

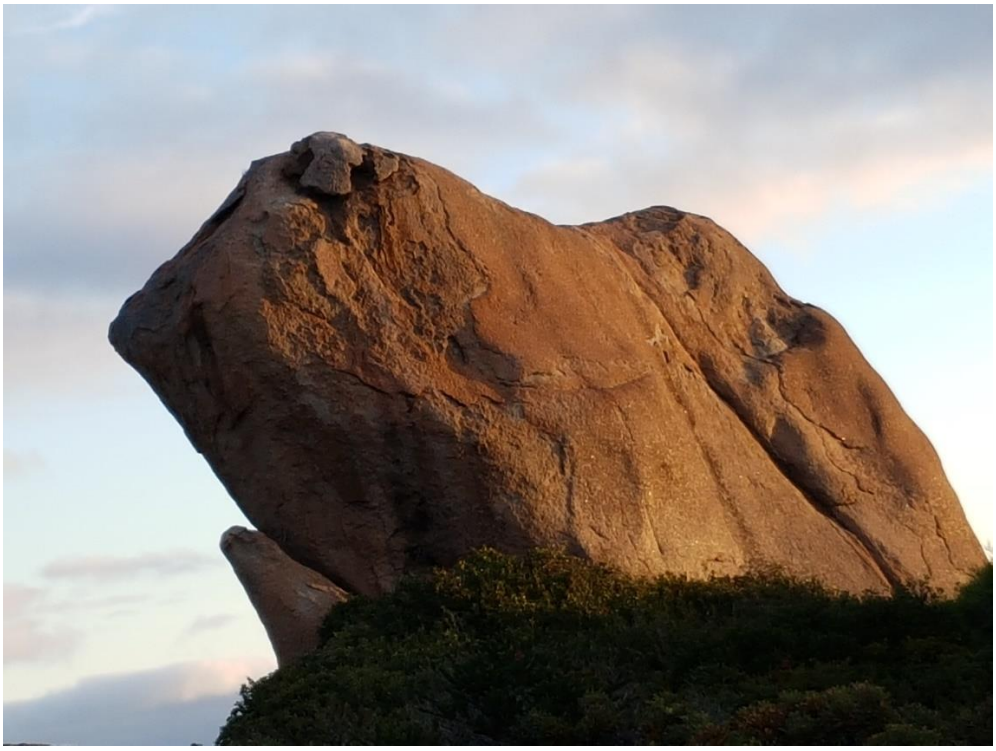
B. repens.



West Beach - Fitzgerald National Park.



Lucky Bay – Cape Le Grande National Park.



Thistle Cove to Lucky Bay coastal walk.

***B. speciosa* regenerating after fire at Lake Monjingup.**

Banksias that can be seen on this tour are*: attenuata, baxteri, baueri, caleyi, coccinea, dryandroides, gardneri var. gardneri, gardneri var. hiemalis, grandis, laevigata ssp laevigata, lemanniana, littoralis, media, nutans var. nutans, nutans var. cernuella, occidentalis, oreophila, pulchella, repens, seminuda, speciosa, violacea.*

Others growing in this region are: *blechnifolia, ilicifolia, petiolaris, pilostylis, praemorsa, sphaerocarpa var. sphaerocarpa, verticillata.*

K & K Collins.

Jessica Huss et al. research projects.

Banksias are still capturing the curiosity of scientific researchers.

Intricately patterned inflorescences, large woody seed- holding cones, complex proteoide root systems, varied fire adaptation regimes and growing habitats over vast distances within very different climatic zones, along with general accessibility, continue to make them an attractive genus for all manner of research.

Jessica Huss et al. have continued banksia research with several projects over the past few years with the backing of the Max Plank Institute of Colloids & Interfaces, Potsdam, Germany.

One research project and findings were published in 2017, in a paper titled;

'Climate -Dependent, Heat - Triggered Opening Mechanism of Banksia Seed Pods.'

Here, the enigma of "How do the follicles open?" has been examined. This study has investigated the opening mechanism of seed holding follicles of Banksia *attenuata* cones collected from wild-grown plants, ranging 350 kms from the southerly woodlands to the northerly shrublands of southwest Western Australia.

Temperature and moisture were found to affect the follicle opening and the seed release by their influence on the waxes and celluloid at the interfaces of the follicle and at its junction. The shorter more northerly samples were more likely to be dependent on frequent hot fires to open and the taller southerly sample was more likely to disperse seeds spontaneously.

The reason for these differing patterns was linked to the curvature of the multi-layered follicle tissue: Northern follicles are more strongly curved and are thereby able to resist bending (opening) much more than the flatter follicles from the South. However, once the follicles are exposed to heat of fire, the elasticity of the tissue increases, which then results in the release of accumulated tension in the tissue due to previous drying. This process finally leads to the initial opening of follicles.

Interesting implications for building materials and design structures may result from this study of stimuli-responsive changes in shape.

For more reading ; http://onlinelibrary.wiley.com/doi/10.1002/advs.201700572/full

Another study published in 2019 was titled;

"Protecting Offspring Against Fire: Lessons from *Banksia* Seed Pods".

Three species of banksia, *serrata*, *prionotes* and *candolleana* were examined to show how the seeds were protected from heat and rapid oxidation during fire.

It was found that they rely on a multicomponent system, consisting of two valves, a porous separator and a thin layer of air surrounding the seeds. Follicle size, valve thickness, degree of embedment into the central rachis and thermal insulation qualities of the separator are the main components which combine to effectively protect canopy-stored seeds during fires.

The geometric arrangement of these components determines the rate of heat transfer and is the key difference in the design of cones of different species.

Results were attained examining the following: temperature during experimental burns, structural and thermal properties of the follicles, heat transfer through the valves, network of antioxidative tissue, employing Thermal conductivity measurements and FT-IR spectroscopy.

To learn more and view the complete paper and findings click on the link below.

https://www.frontiers in.org/articles/10.3389/fpls.2019.00283/full

Comment:

Further attributes such as retention or loss of florets on cones, flammability of the plant foliage, presence of flammable oils in some species' follicles could be studied to determine the heat exposure of follicles for a range of species within different sub-sections of banksia. Alternately an analysis of the oil component in follicles and its' ignition temperature.

Members, we are always interested in specific research or ideas for such.
Feel free to email us with your ideas. K.Collins.

Robbie Blackhall -Miles & Ben Ram's Banksia collection at Llanberis, North Wales, U.K.

We had the pleasure of meeting Robbie & Ben in May 2018. They welcomed us and were great hosts assisting us with our huge southern UK & Western Europe botanic garden tour. Robbie is the chairman of the Australian Plant Society and a member of our study group. Together they have created a fascinating, tiny backyard National Collection of SE Australian Banksia species. Their love is Proteaceous species which abound in their tiny garden.

They have UK's largest Proteaceae collection with around 10% of species. Their current count is 33 taxa of banksia, not including dryandras. They have established a Plant Conservation Nursery Project with the focus on conservation of rare species and determining the requirements and adaptability of species hardy for UK cultivation.

Robbie met us at Kew Gardens and gave us a guided tour of the gardens and, through his many contacts, we were privileged to tour the inner sanctums of the propagation nursery. Details of banksia species they are growing will be covered in a future newsletter.

On our way to spend some time at their property in Llanberis we visited the National Botanic Garden of Wales, Bodnant and Plas Cadnant gardens.

Learning about their extreme weather conditions and seeing the tiny area of their garden, we were instantly inspired with their endeavours and amazing successes. Not an inch of garden was spared and even the woodshed had a rooftop garden with hundreds of alpine species and a barbeque!

Llanberis sits at the base of Mount Snowden, Wales' tallest peak & 10 miles from the sea. Coldest nights can be -6C with a 2000mm annual rainfall.

They commenced their plantings in 2011. The nursery, on a separate allotment 15 minutes away, was established in 2016. Plants at the nursery are pot grown and put outside during warmer months and put back under cover for the cold winter months.

Their efforts were even more incredulous when they spoke about an unseasonal weather event in 2018, affectionally called "The Beast from the East".

Their article below details what eventuated... makes growing banksias in Australia a breeze!!!
K.Collins.

2018 – An Informative Year

As I write this, summer is coming to an end and so it seems an appropriate time to reflect on how the extremes of weather have affected our garden this year. For the most part, winter in our bit of northwest Wales was fairly average. We saw the typical heavy downpours of November and their accompanying winds. One evening, 22nd November, saw 56mm rain in a very short space of time and the valleys of Snowdonia saw flash floods galore, but on the whole the jet stream was being kind and there was a distinct lack of anything too extreme. Even as late as February 22nd we had not seen temperatures lower than -1.6C. Our small tree of *Banksia integrifolia subsp. integrifolia* had over 50 pale yellow inflorescences gleaming in the low winter light as the frosts, snows and icy winds of the **'Beasts from the East'** began their assault. Almost instantly, many of our evergreen trees and shrubs from Asia started to droop their leaves as the temperature dropped to -5.9C, the humidity dropped to 30% and the wind gusted 80mph. We experienced a few weeks of freezing night time temperatures into the latter part of March and it didn't get much above that during the day. Some of the snow that fell was quite heavy and wet, with the effect of flattening some shrubs and weighing down some enough to snap the odd branch. By this time almost all of our Asian evergreens had lost many of their leaves, tree fern fronds were scorched and battered and the garden was looking

really rather sorry for itself. Surprisingly, despite not protecting any plants in the ground, the Australasian evergreen trees and shrubs were still looking healthy and our banksias were still flowering.

By April, the weather was warming up and the frosts had ceased but the garden was not really growing yet and so continued to look awful well into May. The leaves on *Grevillea victoriae*, supposedly one of the hardiest grevilleas, started to turn brown. Over time, so did those of *Lambertia Formosa, Grevillea robusta, Dryandra formosa, Isopogon anemonifolius, Knightia excelsa, Banksia integrifolia subsp. integrifolia* (two of these), *B. oblongifolia. B. paludosa, B. spinulosa subsp. spinulosa, B. spinulosa subsp. collina and B. ericifolia subsp. ericifolia.* We weren't all that surprised as in previous years similar had happened in the spring as the new foliage came through, however this year there was no new foliage coming through and by the end of May some of the stems had turned black. Then the thought occurred to us that rather than being affected by the cold, the problem may in fact be one of drought. During April rain was infrequent, we hadn't had any rain since 2nd May. We started watering, adding seaweed extract as a tonic as well as sequestered iron. By early June there was still no effective rain and we had almost stopped worrying about the plants that already looked dead, concentrating on getting water into the ground for those that still looked alive, not to mention all the plants in pots. The Asian evergreens had by this point started to put on new leaves and *Dicksonia Antarctica* was finally throwing out new fronds, months later than usual, but *Cyathea australis* and *Dicksonia fibrosa* were still quite crispy with no signs of growth. It got hotter as June progressed, with maximum temperatures over 30C day after day and a summer maximum of 33.4C recorded on 7th July. We were hand watering for 3 hours a day, during dawn and dusk, so the drought wasn't only taking its toll on the plants!

One plant that shocked us, by making its way through the winter unblemished and even flowering profusely in May and June, was *Olearia 'Henry Travers'*. It started putting on new green growth and was looking resplendent. By the middle of July it was dead - I am convinced it was the heat that killed it. Planted in a free draining position, we had been watering it well, one day it looked fine the next, gone. Interestingly, *Olearia angustifolia*, which gets shade in the hottest part of the day and has not yet flowered is still with us. By this point *Knightia excelsa, Banksia paludosa*, and both subspecies of *B. spinulosa* had put on new leaves. *B. oblongifolia* and the smaller of the two *B. integrifolia* were resprouting from the base so were pruned

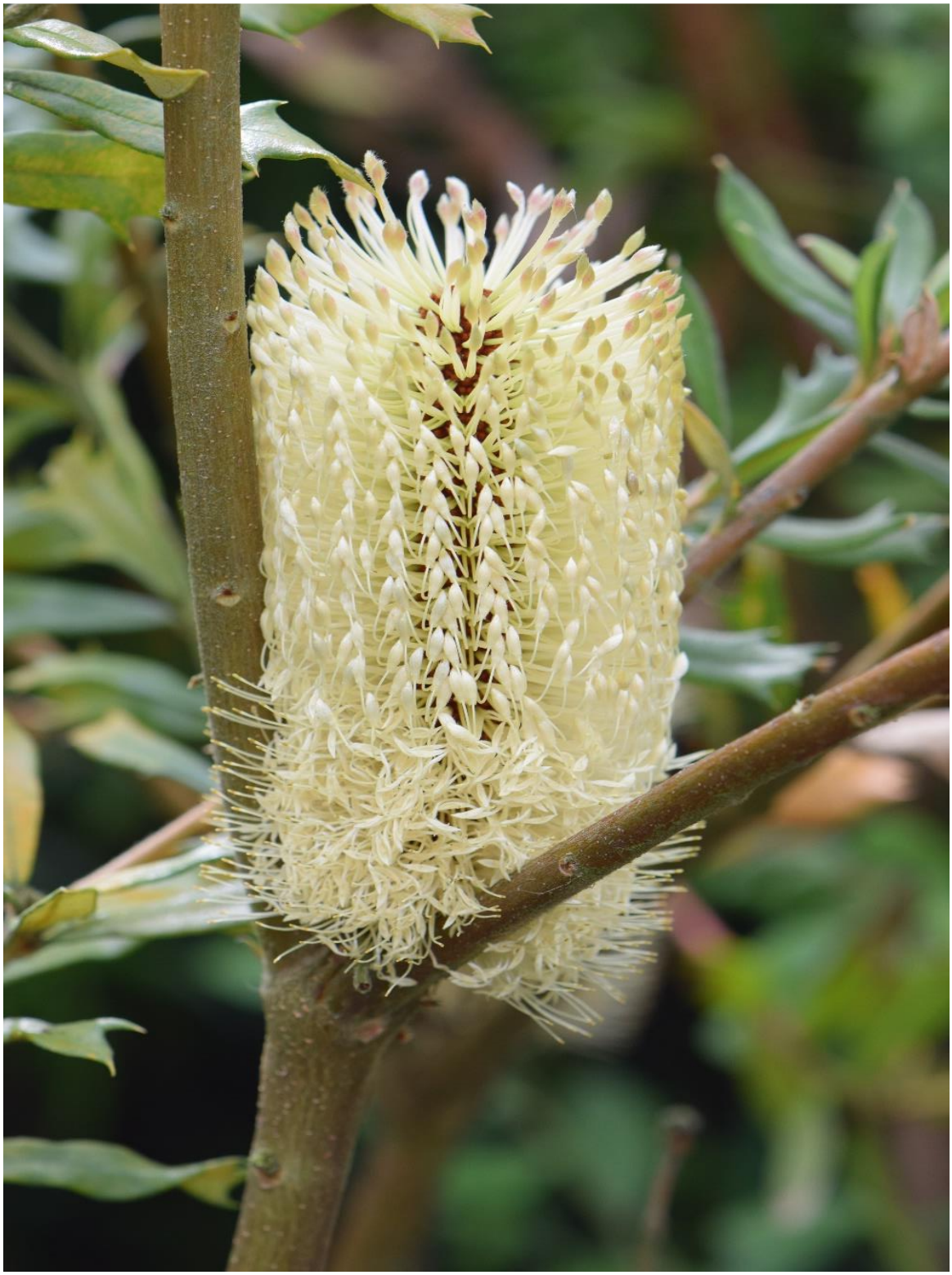
accordingly. *Lambertia formosa* even flowered well although will need some work to bring it back to being the smart shrub it once was.

Eventually we gave up waiting for the remaining brown plants and the ones that never made it were removed. Many of these plants have been in the ground for up to 6 years, so it was a shame to have to see them go, but by this point we really were convinced they were dead. Their wood was black and when we scratched the bark it did not reveal anything green underneath. We are not looking on it as a travesty though, far from it, the 'Beast from the East' and the 'Devil of a Drought' have made space for a whole load of new plants. New additions include *Banksia ericifolia subsp. macrantha, Banksia spinulosa 'Son of Skyscraper', Banksia aemula, Lomatia silaifolia and Isopogon dawsonii*; plants that had sat waiting for their turn in the ground. We have replaced the *B. integrifolia subsp. integrifolia* that died with *B. integrifolia subsp. monticola.* This subspecies comes from the Great Dividing Range of New South Wales, north from the Blue Mountains and is meant to be the more frost hardy subspecies - not that that would help if it is drought that it died of. Looking back, in reality, it was probably a combination of both; Heat and water stress on top of cold stress. *Dicksonia fibrosa* eventually threw up some small fronds but I am not sure I hold out much hope long term as the crown has shrunk quite a bit. Sadly, I am convinced that *Cyathea australis* is dead.

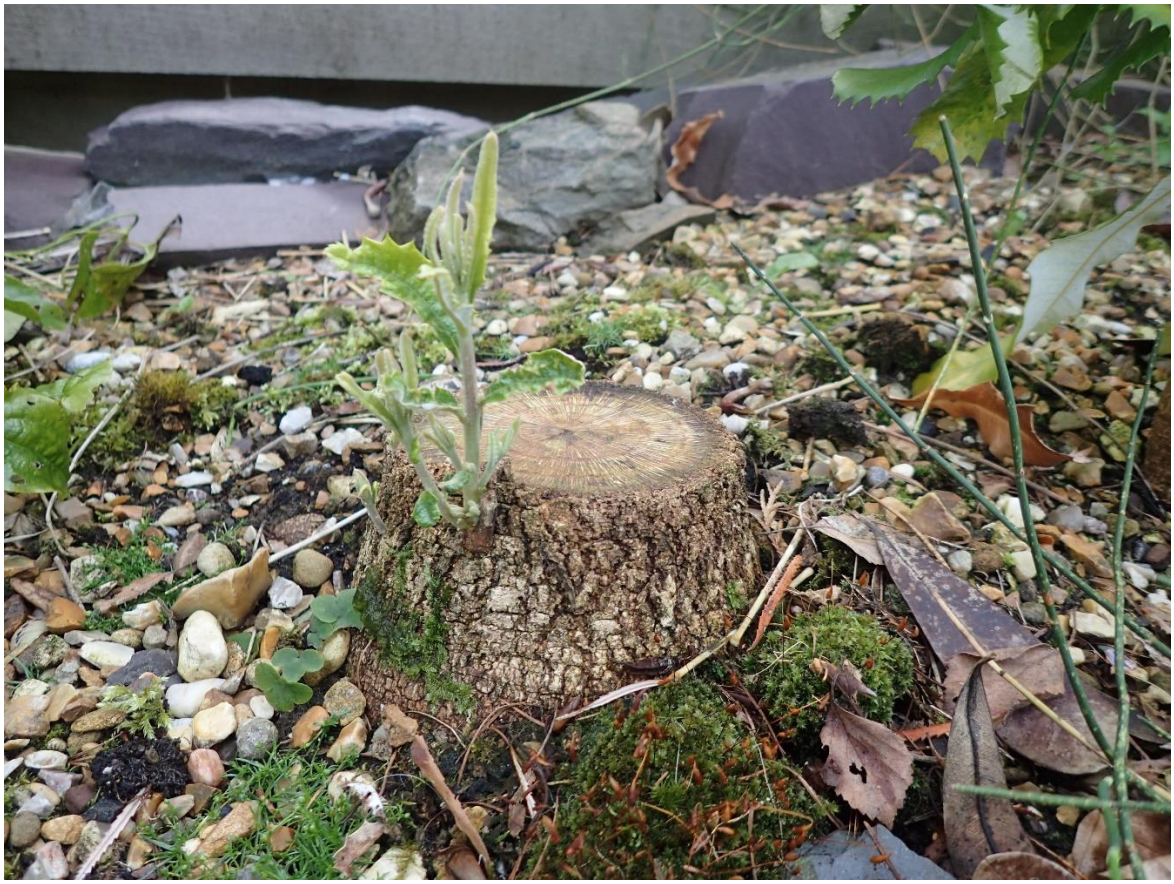
This year has been very informative not only in what can survive such extreme weather, but what can thrive in it. Throughout this year *Wollemia nobilis, Persoonia gunii, Grevillea diminuta, Grevillea miqueliana, Banksia marginata, Banksia canei* and *Grevillea alpivaga* have grown and flowered beautifully. Here's hoping that next year is less extreme.

Ben Ram.

Snow bound *B. integrifolia var. integrifolia.*



B. canei flowering in our Llanberis home garden.



B. integrifolia - Llanberis. (considered dead) re-shoots from basal epicormic buds.

Financials and new members.

Account balance 30.06.2018. $1330.47. Current balance 01.06.2019. $1446.07.

Welcome to our seven new members. It is pleasing to see our numbers are still growing. Thanks to those who have renewed their memberships.

Kathy and I have chosen to discontinue membership fees. This is in line with other study groups who just produce electronic newsletters. It also reduces the huge work load involved in collecting, sending renewals and book keeping.

Members and associations who care to make donations will be greatly received.

We appreciate some members paid in advance and we trust they will consider those pre-payments to be absorbed as donations. K & K Collins.

Footnote: This newsletter is to be considered one for 2018. Health and travel commitments saw us unable to complete this one for 2018 delivery. We are presently working on the next newsletter.