



Focus on Tasmania

Australian Plants

**Winter 2017
Vol 29 No 231**

\$6^{.50}



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Cover photo: Nelson Creek downstream, Dick Burns

Australian Plants articles

Australian Plants is published quarterly to promote knowledge of Australian plants.

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Australian Plants No. 231 Issue of Volume 29, which comprises issues 230–237.

Published quarterly and available nationally in 3000 copies by the Australian
Plants Society NSW Ltd

© Australian Plants Society NSW Ltd 2017 ABN 87002680408 ISSN 0005-0008

Printed by Elect Printing, Fyshwick, ACT Print post approved 100009857

Editorial

Margaret Killen, Convener of ANPSA 2018 Conference; President APST Inc.

Margaret has always been interested in growing things, from nematode trapping fungi to her potted Wollemi pine. She joined the Northern Group of the (then) SGAP Tasmania within weeks of arriving in Launceston from Sydney in 1987. She has held many roles at Group & Regional level..

Tasmania, an island surrounded by its 334 islands, is in a rare latitude for mainlanders to explore and experience something different. The articles in this edition will focus on tempting you to attend the Conference in January next year thus describing some of the themes and tours being offered.

The theme of *Grass Roots to Mountain Tops* is intended to highlight the flora and geology that is uniquely Tasmanian. The Grass Roots aspect will be experienced from two perspectives – firstly, at a coastal level, looking at and visiting saltmarsh wetlands and at a member level with a focus on Study Groups and community projects. You will naturally experience the Mountain Tops during the Conference week excursions and pre & post tours.

Dick Burns, a renowned tour leader and plant Society stalwart, has contributed two articles which are relevant to the *Alpine to Rainforest* tour.

The Royal Tasmanian Botanical Gardens (RTBG) will celebrate their bicentenary in 2018 and we are fortunate to have this distinguished organisation as partners in our Conference. One article covers the challenge of seed hunting on the Islands of the Subantarctic. Secondly, Chris Lang describes the evolution of the Tasmanian Native Collection at the RTBG.

David Boyer lives on and is passionate about Bruny Island which is named after the French explorer Antoine Raymond Joseph de Bruni d'Entrecasteaux. His article highlights this wonderful Island as will be experienced on this one day tour.

King Island is located in Bass Strait about half way between mainland Tasmania and Victoria. It lies in the Roaring Forties and has many special features, as described in Jill Clark's article.

Bruce Champion writes of the flora in the National Parks around Hobart which are part of his pre-conference tour.

The committee encourages you to attend the ANPSA 2018 Hobart Conference. Details are available on the ANPSA website <http://anpsa.org.au> Contact us on asgajjan2018@gmail.com



King Island

Jill Clark

Jill is a member of APST Northern Group. Her interest in native plants began after a visit to the Wildflower Society of Western Australia's annual show in Kings Park introduced her to the diversity and beauty of Australian flora. Jill has taken the positions of President and Vice-President with the Tasmanian society.

The possibility of a tour to King Island for the Conference in 2018 originated after my husband and I spent five days on the island, some six years ago, celebrating our wedding anniversary. We did not have the benefit of a tour guide or a botanist, but still found much to interest us. The island, which is situated at the Western end of Bass Strait, is 64 km long by 26 km wide, with a population of between 1,500 and 2,000. Jagged reefs off the west coast contrast with long stretches of sandy white beaches, some good for surfing, on the east. It is home to 57 known shipwrecks, more than any other coastline in Australia, the worst of which was the *Catarqui* in 1845, when 400 people died. A wreck from 1906, that of the *Shannon*, is visible at low tide on the beach north of Whistler Point, near the mouth of the Yellow Rock River.



The Blowhole,
East Coast

The principle town, Currie, boasts all the basics such as post office, supermarket, dress shop, excellent bakery, golf club and hotel. Other smaller centres are Naracoopa on the East Coast, and Grassy further south. Currie also has a museum, a lighthouse, a kelp industry, and just outside town, the renowned King Island Dairy, where a large variety of cheeses are available for tasting and purchasing. Quantities are limited only by the space in your luggage and your budget!



Sprengelia incarnata

King Island beef has a great reputation and the local farmers have formed a co-op to process the meat. Giant bull kelp, *Durvillea potatorum*, is harvested as a source of alginates used in processed foods.

Evidence points to King Island having arisen during the separation of Australia from Antarctica. The southern part consists mainly of ancient low-nutrient rocks. Large stretches of alluvium cover the north of the island. Of particular note are the stretches of series of dunes up to 4 km deep, referred to as *Old Dunes* and *New Dunes*, formed during periods of sea level changes. During at least one of these times, King Island was part of a land bridge between the continental mainland and Tasmania. One indication of this is the presence of three mainland species, *Eleocarpus reticulatus*, *Hedycarya angustifolia* and *Lepilaena bilocularis*, that do not extend to the Tasmanian main island and thirteen species at their northern limit on King Island.

King Island has a mild maritime climate with average annual rainfall between 675 mm in the north and 1,050 mm in the south. This supports plant growth throughout the year. Being in the path of the Roaring Forties, the prevailing winds are westerly.

The impenetrable tea tree bushland and huge forests of eucalypts, blackwoods, *Acacia melanoxylon*, and tree ferns which once covered the island have been devastated by wildfires and land clearing. They are now replaced with rolling green pastures used for grazing.

Specimens of the coastal banksia, *Banksia integrifolia*, collected from King Island exist in herbaria but it is no longer found in Tasmania. Land clearing and fire also rendered celery top pine, *Phyllocladus aspleniifolius*, extinct on King Island.





But remnant communities remain. These include:

- Swamp Forest of blackwood, *Acacia melanoxylon*, and swamp paperbark, *Melaleuca ericifolia*, scattered across the island in wet depressions.
- Wet Eucalypt Forest dominated by Tasmanian Bluegum, *Eucalyptus globulus* subsp. *globulus* and *E. brookeriana*.
- Dry Eucalypt Forest and Woodland, with a mix of eucalypts, *Banksia marginata* and *Acacia mucronata* ssp. *mucronata* and a varied set of shrubs.
- Sedgeland, formed on poorly-drained soil with sedges, grasses, *Patersonia fragilis* interspersed with *Xyris* sp. and wet-tolerant shrubs such as pink swamp heath, *Sprengelia incarnata*.
- Heathland that includes the normal large diversity of shrub species.
- King Island Scrub, a succession from heathland formed on a range of soil types. Tall shrubs include eucalypts, acacias and *Allocasuarina zephyrea* often with an understorey of smaller heathland shrubs.
- Wet King Island Scrub, reaching to 10 m tall with *Melaleuca ericifolia* and *Leptospermum scoparium* dominant.



Calcified forest



Carpobrotus rossii.

- Wetland and Saltmarsh formed by sand barriers, behind sand dunes or in estuaries.
- Coastal communities on rocky shores and on the dunes.

Beach flora includes pigface, both *Carpobrotus rossii* and *Disphyma crassifolium* subsp. *clavellatum*, salt bush, *Rhagodia candolleana* subsp. *candolleana* and sea celery, *Apium prostratum*, daisy bushes, *Olearia* spp., heaths, fringe myrtle, *Calytrix tetragona*, and several pea flowers.

The island abounds with wildlife, boasting eighty-six species of birds.

The largest of the four lighthouses on the Island was built at Cape Wickham in 1861 from local granite and stands 52 m high. However the opening of a world class golf course at Cape Wickham late in 2015 has really put King Island on the map. The course overlooks the ocean and wildlife such as whales, seals and mutton birds can be seen from it. Two more courses, one in the middle and one at the southern end of the island are planned for the future. Tourism in general is becoming important for the island.

MAIN REFERENCES

King Island Flora: a field guide, by the King Island Natural Resource Management Group published by the Natural Heritage Trust, 2002.

Some notes on the geology of King Island: Tasmanian Geological Survey Record 2007/02, by CR Calver, available on line from Mineral Resources Tas.





Bruny Island

David Boyer

David Boyer retired to build a house on Bruny Island around 2000, where he and his wife Jenny enjoy the attractions of the island and its great community. He has been Treasurer for the Tasmanian Society twice and was active on the organising committee for several Hobart Wildflower Spectaculars.

The third largest of Tasmania's offshore islands, Bruny Island has been a special place over the years, not only for the Tasmanian Aborigines, but for the early explorers of the southern seas, early European settlers and now the current residents. An estimated seventy members of the Nuenonne group lived on Bruny Island, which they called Lunawannalonnah; they were part of the South-East Tribe of Aborigines. They would visit their fellow tribe members on the other side of the channel in their rafts and bark canoes, both of very limited seaworthiness.

Abel Tasman, who discovered Van Diemen's Land (Tasmania) for Europeans, did not stop off on Bruny Island in 1642, and Marion du Fresne by-passed the island on his ill-fated voyage to New Zealand in 1771. Adventure Bay proved to be a favourite of later voyagers. They used the sheltered bay for collecting water, repairing damaged boats and catching fish. There was harmonious interaction between the newcomers and the residents.

In March 1773, Tobias Furneaux brought his ship the *Adventure* into the bay which Furneaux named for his vessel. He saw many fires and signs of habitation but had no direct contact with the "indians". Furneaux's ship was support for Captain James Cook on his second voyage, on the *Resolution*. Cook by-passed Van Diemen's Land on his way to the rendezvous point in New Zealand. While Cook had two botanists on board the *Resolution*, I have found no record of there being any on the *Adventure*, and thus there appears to have been only limited gathering of new plant material. However, Furneaux obtained material from some of the tall trees with long and narrow leaves (either *Eucalyptus obliqua* or *E globulus*) in the area, which were the source of the first eucalypt seedlings to be sold in England¹.

The next European visitor to Adventure Bay was Cook himself on his last voyage, again on the *Resolution*, this time supported by a Captain Clerke on the *Discovery*. In January 1777 he made contact with the natives, and in his five days in the bay, spent some time with them, providing the first analysis of their lifestyle and character. Cook was

on a mission to look for a North-West passage, and thus missed the opportunity of "discovering one of the great harbours of the universe [the Derwent Estuary], just as nearly, seven years before, he had missed seeing and appreciating that other great harbour, Port Jackson"². Cook's surgeon, William Anderson wrote "The inhabitants whom we met with here had little of that wild and fierce appearance common to people in their situation; but, on the contrary, seemed mild and cheerful without reserve or jealousy of strangers." Anderson was also a plant collector and was assisted by nurseryman David Nelson who collected the specimen of *Eucalyptus obliqua* which was used by Charles Louis L'Heritier de Brutelle to describe the genus and the type species.

William Bligh, who was Cook's sailing master, returned to Adventure Bay eleven years later on the *Bounty*. On board were David Nelson and his assistant William Brown. According to Bligh's diary, on 22nd August, Nelson "found a tree in a very healthy state33¹/₂ feet in girth", and three days later, he "...directed a sawpit to be dug, and employed some of the people to saw trees into plank". The location of the sawpit is known and it is hoped that it can be restored. Bligh's only contact with the natives was from a boat when he threw gifts to shore, as the surf prevented him from landing.



The next overseas visitor to the island was Antoine-Raymond-Joseph Bruny d'Entrecasteaux with two ships, the *Recherche* and the *Esperance*. He mapped the waterway which now bears his name as does the island that his exploration revealed. On board the *Recherche* were botanists Jacques-Julien Houtou de Labillardiere and Claude-Antoine-Gaspard Riche to whom we are indebted.

They did an incredible amount of collecting on Bruny Island and the adjacent areas of South

Richea dracophylla
Named for Claude-Antoine-Gaspard Riche



East Tasmania, on both their initial visit in April/May 1792, and a second visit in January/ February 1793. Included in Labillardière's collections were the type material of Tasmania's floral emblem, *Eucalyptus globulus*, and Victoria's floral emblem, *Epacris impressa*. In addition, he collected material from another eucalypt, *Eucalyptus cordata* from Penguin Island at the southern end of the bay on 24th February 1793³.

A feature of Labillardière's narrative of the visits was his description of the cordial interactions with the natives, echoing those of Anderson. There can be little doubt that the term "savages" which was used frequently in diaries of the early explorers is not appropriate for the Nuenonne Tribe. This was recognised by Governor Arthur when martial law, which resulted in the Black War, was declared on 1st November 1828: the Nuenonne people were specifically excluded. However, that failed to limit the rapid decline in their numbers for diverse reasons, and by February 1832, the last of the group had left the Island. Here endeth the history lesson.

Bruny Island is about 55 km long north/south and at its widest 15 km. At about the middle there is an isthmus, known as The Neck, which effectively divides the island's vegetation communities, partly because of the difference in rainfall (average about 700 mm in the north vs 1,100 mm in the south), and maximum altitude (215 m in the north vs 570 m in the south).

The permanent population is about 700, increased markedly in summer by campers and tourists. Access to the island is by car ferry. The trip across one of Australia's best protected sea waterways arrives at Roberts Point on the northern part of the island.



Looking south
across Moorina
Bay to The Isthmus

The nearby vegetation is open eucalypt woodland and pastoral, part of the latter belonging to the Indigenous Land Corporation and used for sheep grazing and training of indigenous youth.

Further north, at Dennes Hill, is one of the few remaining habitats of the endangered Forty-spotted Pardalote, dependent on *Eucalyptus viminalis*. The population is intensely monitored and nesting boxes are provided.

South down Bruny Island Main Road, the shores of D'Entrecasteaux Channel are followed. Pleasant coastal vegetation comprising principally *Eucalyptus viminalis*, *Banksia marginata*, *Allocasuarina monilifera*, *Bursaria spinosa* and *Exocarpos cupressiformis* grows along the foreshore. Specialist industries include cherry orchards, oyster farms and cheese-making.

A little further south, a walk to Cape Queen Elizabeth, traverses low-lying coastal plain with *Leptospermum* spp. and *Melaleuca* spp. the principal vegetation. The walk then passes over low heathland slopes, past a Shearwater rookery and onto the Cape.

The Neck is a thin vegetated strip of old sand dunes, formed as wave action moved sand over what was once the channel of the North-West Bay Rivulet⁴. Near the narrowest section of The Neck, on the highest point, is a memorial to Truganini, said to be the last of the full-blood Aborigines of Tasmania. This has become a focus for tourists, as the site offers almost 360° views. To the east is Adventure Bay, characterised by ocean swells, with Tasman Peninsula in the distance, and to the west is the sheltered water of D'Entrecasteaux Channel, with the mountains of southern Tasmania as backdrop.

Late in summer evenings, the Little Penguins can be seen waddling to their burrows while Shearwaters crash land in the vicinity of theirs. During 2017, it is proposed that Bruny Island Main Road be restructured, by raising it to reduce the potential for damage from storm surges and future sea level rises, as well as providing culverts for penguins to get to the other side of the road safely.

Bird life on Simpsons Bay to the east is notable, with swans regularly feeding at high tide in the water adjacent to The Neck. Further south, the head of the bay is visited by a variety of birds feeding below high water mark and in the salt Lutregala Marsh, now protected by the Tasmanian Land Conservancy. White Bellied Sea Eagles can frequently be seen overhead, as well as the occasional Wedge Tailed Eagle.

Not far south of The Neck, the road branches west to Alonnah and east to Adventure Bay.





Forestry has been a controversial issue in Tasmania and on the island, with timber harvesting carried out up until early this decade. Most of the land available in the past for forestry has been set aside by a moratorium agreed between the conservation movement and the industry.

The northern part of the South Bruny National Park contains the Fluted Cape Walk, which is one of Tasmania's great walks. The flatter section of the walk from Adventure Bay to Grass Point is along a foreshore which was the site of a number of whaling stations in the 1820s through to the early 1860s as it lay on the whales' route between their winter feeding grounds in the Antarctic and their summer calving areas in more temperate waters. The walk is principally through open eucalypt forest and casuarina woodland.

Another walk near Adventure Bay is the Mavista Nature Trail. This is quite a contrast to the Fluted Cape Walk as it is through wet sclerophyll forest and adjacent to a creek.

White wallabies are often seen on Lockleys Road on the way to Mavista Nature Walk, and in the Adventure Bay environs. They are a white morph of Bennett's Wallaby, and are often seen with a grey joey in their pouch or as a white joey in a grey wallaby's pouch.

Alonnah is the administrative centre of the Island, home of the southernmost hotel in Australia. The only visible section of the pontoon bridge which spanned the Derwent at Hobart until 1964 now provides a marina for small boats. Nearby is the start of an easy walk to Sheepwash Bay, which meanders through open coastal bush of casuarina, banksia and acacia.

South from Alonnah is the southernmost winery in Australia and the village of Lunawanna which used to be a rural centre for sawmilling and agriculture but is now principally a residential enclave. Southwest of Lunawanna the road enters the South Bruny National Park and descends towards the most southern point of the Island and Bruny Lighthouse. This iconic landmark is the third oldest lighthouse in Australia, now replaced by a solar powered light on the adjacent hill.

The views from the lighthouse on a clear day are well worth the walk from the car park. Occasionally Pedra Blanca and the adjacent Eddystone Rock 28 km off the south coast of Tasmania are visible. To the north-west is Labillardier Peninsula which is accessed by the Luggaboine and Labillardier walking tracks starting at Jetty Beach.

Turning east at Lunawanna the road passes the privately-developed Inala Jurassic Garden which displays many of Tasmania's Gondwanan



species and ends at Cloudy Bay, in the National Park. The walk from here to East Cloudy Head is one of the best on the Island for special flora, particularly in late spring, with many orchids, *Leptospermum* spp. and *Blandfordia punicea*.

Blandfordia punicea

FLORA and FAUNA

North Bruny's relatively lower rainfall and altitude and warmer temperatures have resulted in it having vegetation similar to the coastal area on the Tasmanian mainland, with dry sclerophyll forests including the southernmost occurrence of *Xanthorrhoea australis*, orchids and coastal shrubs. South Bruny, with its greater rainfall and variation in altitude has more diverse flora.

This is most noticeable on the drive between Lunawanna and Adventure Bay; crossing the spine of Bruny at an altitude of nearly 500 m. At the lower levels, the dominant species is *Eucalyptus obliqua*, and occasional *Eucalyptus globulus*, with understorey being mainly *Pomaderris elliptica*, *Pittosporum bicolor*, *Exocarpos cupressiformis*, *Monotoca glauca*, *Acacia verticillata*, *Melaleuca* and *Leptospermum* spp. and *Billardiera longiflora* and with *Gahnia grandis* occupying any areas that are not overcrowded.



However, in the vicinity of the ridge, there is rainforest, with *Nothofagus cunninghamii*, *Telopea truncata*, *Eucryphia lucida*, *Prostanthera lasianthos*, and *Acacia riceana*. In the understorey is *Aristotelia peduncularis*, *Richea dracophylla* and *Tasmannia lanceolata*, with the occasional *Prionotes*

Billardiera longiflora





Aristotelia peduncularis and *Blechnum wattsii*

cerinthoides. On another track a little further south, there is a grove of *Melaleuca pallida*, 25 to 30 m high, one specimen with a trunk diameter of 560 mm.

Birdlife on the island is abundant with all of Tasmania's endemic birds, including the critically endangered Forty-spotted Pardalote present. Another critically endangered bird, the Swift Parrot has started wintering on the island, an indicator of global warming.

Bruny Island is also special for the presence of twenty-seven of Tasmania's thirty-four terrestrial mammal species, the highest number of any of Tasmania's offshore islands. While there are no Tasmanian Devils or Wombats, North Bruny has an abundance of the endangered Eastern Quolls. These cuties have become seriously depleted in other parts of the state, and were thought to be extinct on mainland Australia.

The island also has its share of feral animals, with the normal feral cat problem, and deer having recently escaped onto the island.

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- 3 Edward Duyker (2003), *Citizen Labillardiere: A Naturalist's life in Revolution and Exploration (1755–1834)*, The Miegunyah Press.
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A Desert in the Rainforest

Dick Burns OAM

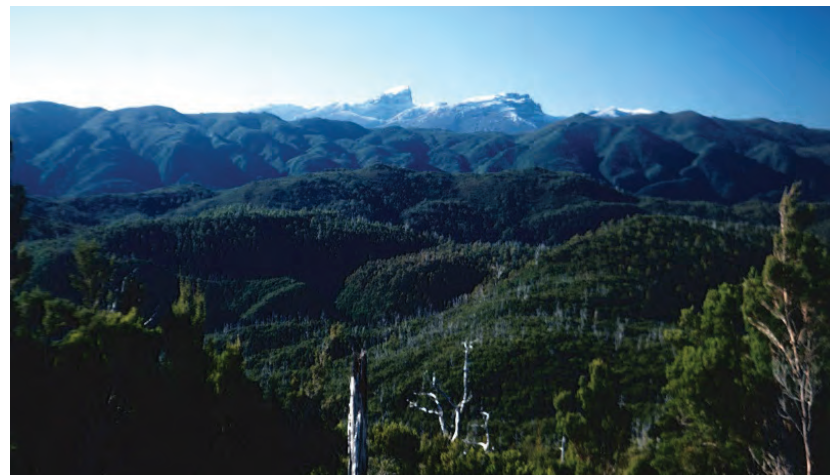
Dick has been a resident of Tasmania since 1970. He has explored many of its wonders, by road or as a curious bushwalker. Dick is a life member of the Australian Plants Society Tasmania (APST) and has held various positions within ASGAP (now ANPSA) and APST. In 2007 he was honoured with the Australian Plants Award (amateur).

Creating a desert

An apocalyptic science fiction novel, *Earth Abides*, was published in 1949. The author, George R Stewart, considered what would happen if most of the human population perished through a viral infection. The central story of the novel was how human society would change but, at the same time, nature is finding a new balance after man's depredations. It is an ecological tale, told before the concept of balance in nature was recognised.

The West Coast Range of Tasmania has had its share of apocalypses: one natural, one man-made.

Some 800,000 years ago, a meteorite smashed into the land east of Mt Darwin in the south of the range creating a crater 1.2 km wide. The vegetation for kilometres around would have been destroyed. Core samples taken from the Darwin Crater tell us that the vegetation that reclaimed the crater cycled through the changes induced by advancing and retreating of glaciers. It is now, like the surrounding land, largely rainforest.



Tasmanian rainforest with Frenchmans Cap and Clytemnestra on the horizon, the Darwin Crater forward left





Eucryphia lucida

In the 1880s alluvial gold was found around Mt Lyell, north of the Darwin Crater. At that time most of the vegetation on the hills and in the valleys around Mt Lyell was mature cool temperate rainforest, as would be expected in an area with an average annual rainfall of 2,408 mm (Hobart's is 626 mm).

The dominant tree of the canopy was *Nothofagus cunninghamii*, myrtle beech. As with today in other nearby rainforests, *Eucryphia lucida*, leatherwood, would have emerged as part of the canopy.

Other tree species that would have been present, but not necessarily emergent, are *Atherosperma moschatum*, sassafras, *Athrotaxis selaginoides*, King Billy pine, *Phyllocladus aspleniifolius*, celery top pine, *Richea pandanifolia*, pandani and *Dicksonia antarctica*, soft tree fern. In the understorey, the large, wide-spreading plant *Anodopetalum biglandulosum*, horizontal, and other fast growing shrubs would

have created a tangled, near-impenetrable barrier for prospectors. Possibly there would have been near-pure stands of some species as is still found further north where there is a valley full of *Telopea truncata*, Tasmanian waratah.

From late spring into summer the white flowers of the large shrubs *Acradenia frankliniae* and *Anopterus glandulosus*, native laurel, would have shown through the green. In early autumn, the rainforest would have lit up with pink festoons of *Prionotes cerinthoides*, climbing heath, wandering up trunks and draped between trees.

In the valley of waratahs north of Queenstown, with at least two colours of *Telopea truncata*. The foreground shrub with white fruits is *Gaultheria hispida*.



Prionotes cerinthoides



Leptospermum riparium

The forest floor would have consisted of slowly decomposing fallen trees with colonies of ferns, mosses and other plants tolerant of low light. Along creeks and rivers ancient trees of *Lagarostrobos franklinii*, Huon pine, grew, its foliage draped down to the tannin-coloured water. Mass-flowered shrubs such as *Leptospermum riparium* and *Epacris franklinii* relished the extra light.

The gold quickly petered out but rich deposits of copper ores were found. These were mainly bornite, chalcocite and chalcopyrite, all rich in copper but also with high sulphur content. It was found that wood heating brought some ores up to a temperature where the sulphides started reacting and generating more heat to release the copper. During the reaction the sulphide compounds formed the gases sulphur dioxide and sulphur trioxide, both soluble in water, forming sulphurous and sulphuric acid respectively. The gases thickened the regular west coast fogs into corrosive palls that filled the Queenstown and nearby valleys. Every summer bushfires swept across the mountains. Peat, the partially decomposed vegetation that had accumulated on the rainforest floor, burnt – taking the fire further into and under the forest. So the vegetation was cleared to provide wood for the furnaces, the acids and bushfires killed the vegetation and the heavy west coast rainfall washed away the exposed soil.

The Queenstown Desert was created.

The map of the vegetation of Tasmania marks it clearly.

Around Queenstown, the tilted layers of pink, white and cream rock were exposed, especially on Mt Lyell, the large mountain that formed the backdrop to the town. For many years tourists came to see the bare rock slopes, as their buses wound down into Queenstown on the Lyell Highway, cut precariously into the spurs of the mountain.





Recovering

In 1922, a new smelting technique was introduced that did not require wood nor did it release sulphur into the air. The hills could start to recover. Not so the rivers. Over the years, the mining company had dumped an estimated 100 million tonnes of crushed rock and tailings into the Queen River, which washed into the King River then into Macquarie Harbour. These crushings and tailings still contained copper along with other heavy metals and sulphides. Banks of the crushed rock can be seen along the King River from the ABT Wilderness Railway. The delta of transported tailings at the mouth of the King River is the size of a city suburb. The sulphides in the tailings react with water and oxygen to form sulphuric acid. This acid leaches metals including copper, iron, manganese and zinc out of the crushed rock. The metals and the acid have killed all life in the rivers and they will continue to leach out for hundreds of years.

After 1922 residents of Queenstown could at last have successful gardens. They found that rhododendrons liked the cool climate. So much so that some, especially the invasive *Rhododendron ponticum*, started to spread into the recovering tea tree scrub. Along the ABT Wilderness Railway, the spot where a maintenance man's cottage stood is marked by an expanding grove of fuchsia. Other garden escapees include *Leycesteria formosa* notably around Lynchford. Birds (or people) brought in *Rubus fruticosus* complex, blackberries.

Today, from Queenstown one can see green creeping up the valleys of Mt Lyell. The pioneering tree *Acacia dealbata*, silver wattle, is a major contributor to the advancing green. In a good spring its bright yellow flowers would add a new colour to the mountain. However, mixed with the wattle is one of Tasmania's worst weeds, *Ulex uropaeus*, gorse, along with introduced *Pinus* spp. Sedges and rushes, along with other pioneer plants such as *Gaultheria hispida*, snowberry, are also advancing.

Many miners lived on the eastern side of the Range in Linda and Gormanston. The effects of tree felling and acid clouds can be seen in this bare valley. Marble gravestones in the Linda cemetery were dissolved by the acids. After the areas near the smelters were stripped of timber, a railway heading south to Kelly Basin on the upper reaches of Macquarie Harbour was used to supply fuel. Two long-gone towns, Crotty and Darwin, were established along the railway. Indigenous vegetation has reclaimed these sites,

The creation of the Darwin Crater devastated the area but the rainforest has recolonised with the same mix of species as the rest of the West

Coast Range. However, the rainforest and scrub that reclaims the devastated land around Queenstown and Mt Lyell will have a new mix of plants into the future.



Mount Lyell recovery: 1964 (top) and 2017 (above).





The Central Plateau of Tasmania a land of lakes and wonder

Dick Burns OAM

Tasmania is custodian of over half the snow country of Australia with the largest single extent of montane and alpine habitat being the Central Plateau. The Plateau area is studded with sparkling lakes and abounding beauty, is a wanderer's delight, with treasures of both rare and picturesque plants.

Unique in Australia, the Central Plateau itself is a rare phenomenon on earth. It was elevated to its current height some 70 million years ago as the rupturing of Australia from Antarctica squeezed and fractured Tasmania. The Plateau is bounded on the west by a precipitous rim with Travellers Range as the south west corner up to Western Bluff and on the north by the cliff line of the Great Western Tiers, then down east to Table Mountain, its south east corner. The 600 m contour marks a convenient southern boundary. The Central Plateau is at its highest in its north west, around 1340 m, with peaks rising to 1420 m, and lowest towards the south east.

The major surface rock is 180 million year old dolerite. This formed from molten magma that intruded into older rocks early in the breakup of Australia and Antarctica. Dolerite is common in Tasmania but only found in a few other places worldwide. The mudstones and sandstones



Looking east to the Central Plateau from the Walls of Jerusalem.

into which the dolerite intruded outcrop occasionally. Flows of lava, starting some 40 million years ago, cooled into basalt

There are some 4000 lakes on the Plateau. Most were carved as ice sheets some hundreds of metres thick scoured the landscape into its current gentle undulations. This occurred during the most recent ice age that started some 2 million years ago. So the geology and landforms of the Central Plateau are rare, some even unique. The dolerite and the basalt provide substrates that support unusual plant communities.

An abundance of water, the high altitude and the topography make the Plateau attractive to not only biologists, bushwalkers and photographers, but also over time to fishers, graziers, timber-getters and power engineers from Tasmania's electricity generator and supplier, formerly the Hydro-Electric Commission (HEC). The impact of bushwalkers on popular areas such as the Walls of Jerusalem and fishers on the lakes west and north of Lake Augusta is monitored and controlled. Grazing has ceased. Many of the timber holdings of the timber company Gunns Ltd are now managed as conservation areas. Most of the Central Plateau is now part of the Tasmanian Wilderness World Heritage Area (WHA) and other sites important for their conservation values are owned by Tasmanian Land Conservancy.

However, human practices, some of which are outlined below, have affected the area either long-term or permanently. Severe fires swept through parts of the WHA in late 2015, and it is a concern that climate change will increase the frequency of such events.

Plant communities of the Central Plateau

A. On the slopes: altitude 720 – 820 m

Open dry sclerophyll forests are dominated by one or a pair from *Eucalyptus delegatensis* ssp. *tasmaniensis*, *E. pauciflora* ssp. *pauciflora*, *E. dalrympleana* ssp. *dalrympleana*, and *E. rodwayi*. The understorey will vary but *Bedfordia salicina*, *Olearia viscosa*, *Lomatia tinctoria* and *Leptecophylla juniperina* ssp. *parvifolia* are common.

Valleys not subject to frost tend to have wet sclerophyll eucalypt forest or closed rainforest dominated by *Nothofagus cunninghamii* and *Atherosperma moschatum*. The *Eucalyptus pauciflora* forests are particularly striking with the large graceful buttressed trees and their pink and white stripes.

Eucalypt forests are affected by fires and their frequency. But at the other extreme, these forests are destroyed by 'killing frosts' every fifty years or so. Lower temperatures make air heavier, so trees on the





Leptecophylla juniperina subsp. *parvifolia* in the morning frost.

lower slopes are more affected by such chilling events. In frost-prone hollows forest is replaced by grasses, sedges, etc.

Grasslands are often dominated by *Poa billardieri*. Sedgeland develops on more acid soils, dominated by *Lepidosperma filiforme* or *Gymnoschoenus sphaerocephalus*, the latter form commonly called button grass plains. Above the lower plains on less acid soils, epacrid heathland grows, with species such as *Sprengelia incarnata*, *Richea acerosa* and *Epacris gunnii*.

B. The lower Plateau surface: altitude 915 – 1,065 m

The characteristic vegetation of this surface is woodland dominated by *Eucalyptus delegatensis* ssp. *tasmaniensis*, *E. pauciflora* ssp. *pauciflora*, *E. dalrympleana* ssp. *dalrympleana*, and *E. gunnii* replacing *E. rodwayi*. *Eucalyptus delegatensis* and *E. dalrympleana* tend to form forest on sheltered eastern slopes. The understorey is thin, containing combinations of *Olearia persoonioides*, *O. viscosa*, *Lomatia tinctoria* and *Leptecophylla juniperina* ssp. *parvifolia*. This surface was particularly affected by grazing and burning practices. Tall tussock grassland dominated by *Poa billardieri* or *P. gunnii* on wetter pockets along with inter-tussock herbs such as *Microseris scapigera*, *Xerochrysum subundulatum*, *Coronidium* species and *Podolepis jaceoides* have been replaced by unpalatable shrubs of Asteraceae and Epacridaceae.

Stony soils on ridges and slopes carry shrubland dominated by *Hakea lissosperma*, *Olearia* spp. and the *Leptecophylla*. Exposed or windy

sites with shallow soils develop their own communities, including prostrate *Grevillea australis*, *Montitega dealbata*, *Cryptandra alpina* and *Pimelea pygmaea*. Wet areas develop herbfields or bolster moors with the cushion plants *Abrotanella forsterioides* and *Pterigopappus lawrencei* or banks of *Astelia alpina* var. *alpina*. Another component of the herbfields is *Coprosma moorei*.



Coprosma moorei

C. The upper Plateau surface: altitude 1,190 – 1,340 m

Over the western section of this surface, soils are mostly thin high moor peats over bedrock; to the east they become yellow-brown alpine humus soils with boulders of dolerite. The tree line is difficult to define in Tasmania; woodland or forest may develop above alpine communities. Patches of eucalypt woodland, montane rainforest and coniferous forest occur in sheltered sites or areas of higher precipitation and weaker frosts.

Eucalypts are commonly *Eucalyptus gunnii*, *E. coccifera* and *E. subcrenulata*. *Nothofagus cunninghamii* becomes stunted and is joined by the deciduous *N. gunnii* on the southern Plateau. The tree conifer is *Athrotaxis cupressoides* and it may form low closed forests with other conifers *Diselma archeri* and *Pherosphaera hookeriana* (syn. *Microstrobos niphophilus*). Rocky sites provide the environment for trailing shrubs such as *Podocarpus lawrencei*, *Leptospermum rupestre* and *Muehlenbeckia axillaris*.





Bolsters formed by the species mentioned above are a major controlling influence of wetland communities at high altitudes in Tasmania. The bolster plants dam water flows, changing growing conditions. As well, other species such as *Plantago gunnii*, *Sprengelia* spp., *Coprosma* spp., *Gaultheria tasmanica* and *Pentachondra pumila* grow in the cushion plants themselves. Eventually alpine heathland succeeds, with species including *Richea acerosa*, *Boronia citriodora* ssp. *citriodora*, *Baeckea gunnianus* and *Epacris serpyllifolia*. Tall closed shrubland may succeed, dominated by *Richea scoparia*, *Orites revoluta* and *O. acicularis*.

D. The peaks: altitude: 1,340 – 1,460 m

In the north western corner of the Plateau, outcrops of dolerite stood above the ice sheets. These nunataks show glacial, such as cirques, or post-glacial features, most strikingly the block streams. Soils are shallow peats or accumulations within boulder fields.

Eucalypt woodland develops on sheltered slopes with *Eucalyptus coccifera* and/or *E. subcrenulata* over dwarf *Nothofagus cunninghamii* or shrubs such as *Olearia pinifolia*. Conifers occur as copses of *Athrotaxis cupressoides* or closed heath of *Diselma archeri* and *Pherosphaera hookeriana* mixed with *Olearia pinifolia* and *Archeria comberi*.

Other heathlands contain *Coprosma nitida*, *Richea scoparia*, *Orites revoluta*, *O. acicularis* and *Planocarpa petiolaris*. There are species adapted to most of the extreme environments such as *Podocarpus lawrencei* among and over dolerite boulders.

Rich lichen florae cover the boulders and rock faces, setting up conditions for later colonisations.



Archeria comberi

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ANPSA 2018 Conference – Hobart

Grass Roots to Mountain Tops

The Australian Native Plants Society (Australia) Inc. (ANPSA) National Biennial Conference, in conjunction with the ANPSA Biennial Meeting and Seminar, is being held in Hobart, Tasmania in January 2018.



Dates: Seminar and Biennial Meeting Sunday 14 and Conference Monday 15 to Friday 19 January 2018.

Highlights: are pre and post Conference tours on King Island, Bruny Island, alpine and rainforest areas of the Tasmanian mainland and Hobart & Environs including National Parks and World Heritage areas.

An excellent program of speakers, A J Swaby Address, Conference dinner, Reception at Government House, Royal Tasmanian Botanical Gardens 200th year, excursions to local plant communities and member's gardens, Study Group focus and of course, socialising with old and new friends.

Key dates: 20 August closes for King Island Tour; 30 September early-bird registration closes; 15 December standard registration closes.

REGISTRATION is open. Follow the links on the ANPSA website Home page anpsa.org.au to the Biennial Conference website.

Photo: Hobart Waterfront – Business Events Tasmania.

Some of the special sites of the Plateau

Travellers Range

This sub-alpine region, carved by glaciers, marks the south west edge of the Central Plateau. It has the magnificent outlook of the jagged peaks above the south end of the Overland Track. It is magic to walk among tarns that are embraced by dolerite boulders or trees of *Athrotaxis cupressoides* and *Eucalyptus coccifera* or enclosed by the deciduous *Nothofagus gunnii*, turning orange-gold in mid-autumn.



The glaciated Travellers Range, a land of tarns in dolerite and magnificent sub-alpine flora.

Walls of Jerusalem

A plan was drawn up in 2013 by the Tasmanian Parks and Wildlife Service to deal with the visitation to this popular alpine area. It is on the north western edge of the Plateau where the bedrock is dolerite. Walkers come for the imposing glaciated peaks and features, all names coming from the old city of Jerusalem: West Wall, The Temple, Pool of Siloam, Damascus Gate.

Lake Augusta sand hills

There are seven 'hot spots' in Tasmania, where there is a higher-than-normal number of endemic plants. It is believed these centres of locally endemic higher plants developed in response to the cyclic expansion and contraction of range as glaciers formed and retreated in the most recent ice age. The Central Plateau is one of the hot spots,



with several species such as *Eucalyptus archeri*, *Planocarpa nitida*, *Milligania longifolia* and *Pimelea pygmea* found only on the Plateau, and the sand hills on the shore of Lake Augusta is an exciting place to search for them.

The bedrock is dolerite which does not contain quartz so these hills are thought to have derived from glacial till, washed from retreating glaciers. It was deposited in lakes. In prolonged dry periods, the sand was blown up into the present dunes.

Lagoon of Islands

The Lagoon of Islands is at an altitude of about 700 m, in open forest dominated by *Eucalyptus pauciflora* subs *pauciflora*. The islands of the name were floating rafts of vegetation. The rafts were created as rhizomes of the aquatic sedges, *Chorisandra cymbaria* and *Cladium tetraquetrum*, interlocked to form a mat. The mat picked up floating debris and, over time, was colonised by the sedge *Carex appressa*. Seeds of local shrubs arrived to create a shrubbery containing notably *Leptospermum lanigerum* and *Melaleuca virens* (syn. *Callistemon viridiflorus*).

Conservationists and environmentalists did not have a strong voice in the 1960s. So objections were ignored when the HEC flooded Lagoon of Islands in 1964 to provide irrigation water for property owners along the Ouse River. The water level was only raised by some metres, still too high to support island growth. A feeder canal was constructed to supplement the supply but this water was nutrient-rich. The decaying sunken islands added more nutrients, making the irrigation water too rich for farming. The canal was blocked in 2010 and the dam was removed in 2013. It is hoped islands will re-form.

Main references

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Tasmanian Native Collections at the Royal Tasmanian Botanical Gardens: the story so far

Christopher Lang

Chris is Curator of Tasmanian Flora at the Gardens with overall responsibility for the in-ground Tasmanian collections and associated programs. He has been involved with a number of on-and off-site conservation activities throughout his 29 years at the Gardens. Chris counts this aspect of his job as most rewarding.

The Royal Tasmanian Botanical Gardens (RTBG) is fortunate to be located in a state adorned by a rich, diverse flora that includes many unique plant species found nowhere else in the world. We have a self-acknowledged responsibility to demonstrate, through further collection developments, a strong commitment to the display of our wonderful indigenous plant heritage.

A Brief History

The display of Tasmanian native plants at the RTBG began just ten years after the establishment of the Government Gardens in 1818. It was during the tenure of William Davidson, appointed the first Superintendent of the Gardens in 1828, that Lieutenant-Governor Arthur's wish for a botanical garden on the Domain with the addition of local native plants was realised. Within four months of his engagement Davidson organised the collection of over 130 native species from Mt Wellington for display in the Gardens. It is unknown what happened to Davidson's original collection and it wasn't until 1991 that a much stronger commitment to our own flora became manifest through the establishment of the Tasmanian Native Section (TNS), heralding a new era for the display of Tasmanian plants at the RTBG. The Gardens were very fortunate to employ the services of Parks and Wildlife botanist and native plant expert Sib Corbett to design, landscape and collect material for the new section. Sib's enthusiasm, expertise and incredible work ethic demonstrated throughout the construction phase and beyond set the foundation for a successful collection that still includes a considerable number of the original plant specimens.

The Collections Today

Since establishment of the TNS, a number of variously themed Tasmanian flora displays have been established or enhanced (including a natural Grassland remnant and rehabilitated foreshore area) collectively displaying some 500 plant species, around 90 of which are listed as rare and threatened.



Sib Corbett directing proceedings during construction of the Tasmanian Native Section.

These collections demonstrate how Tasmanian plants can be used in the landscape and provide visitors with a valuable identification and education resource. They also play a key conservation role, through helping to raise awareness about plant diversity and threatened species.



Former RTBG botanist Sue Wells and Mark Fountain, now Deputy Director of RTBG, collecting seed for the Tasmanian Native Section.

Most of the specimens included in the collections have been wild sourced on numerous field trips conducted state-wide, with the Tasmanian Seed Conservation Centre providing further access to material in recent years.

There has been much trial and error over the years, with staff gaining valuable experience in the cultivation of a wide range of native Tasmanian plants, some of which have proved difficult to grow in cultivation. The presence of *Phytophthora cinnamomi* (root rot disease) in areas of the TNS and the Tasmanian Ericaceae collections has unfortunately resulted in significant loss of specimens. Thankfully, a combination of strict hygiene protocols and disease suppressing cultural practices have minimised losses in recent years. Experience has taught us much, and the collections are now thriving with an impressive range of species on display.

Tasmanian Native Section

The Tasmanian Native Section comprises a geographically focussed collection of Tasmanian native plants arranged in related habitat groupings. The thematic intent was to create a display that encapsulated the diversity of the state's flora through representation of Tasmania's major vegetation types. Specimens are arranged in habitat groupings ranging from alpine through to coastal flora. There are around 300 species on display including Tasmania's iconic Huon pine (*Lagarostrobos franklinii*). The Collection has been dedicated to the memory of AP May, Superintendent of the Gardens, 1976 to 1992.



Huon pines growing in the Tasmanian Native Collection with recently installed interpretive signage telling the fascinating Huon pine story.

Tasmanian Fernery

The Tasmanian Fernery is a taxonomically focussed display which aims to demonstrate the diversity of the state's fern flora. The collection is housed in a 1964 built structure designed by Walter Tobias (Superintendent 1960–1968).





Extensive refurbishment works during 2002 culminated in the planting of around 200 specimens representing a range of primarily wet forest ferns and fern allies and a number of associated flowering species.

Greater Hobart Collection

The Greater Hobart Garden, located at the north-western end of the Gardens, is a geographically focussed display featuring a range of plant species that occur naturally within an approximate 40 km radius of the Hobart CBD. The display provides a valuable identification resource and aims to demonstrate the diversity and appealing qualities of Greater Hobart's rich flora through the display of larger groupings of a range of plant species.

Grassland Remnant

Encapsulated within the Gardens boundary at the northernmost extremity of the Gardens is a small but significant, moderately degraded grassland remnant containing a significant number of typical native 'grassy vegetation' species including four listed as rare and threatened. Maintenance guidelines ensure that the important natural values of the remnant are maintained and enhanced.

French Explorers Collection

This Collection, located in the eastern region of the Gardens, is a heritage focussed display representing plant species collected by the early French botanists on various expeditions to Tasmania during the late 1700s and early 1800s.



The French Explorers Collection with *Banksia* 'Mini Marg' featured in the foreground

The notes and plant lists of Jacques-Julien Houtou de Labillardière, botanist on the Bruni d'Entrecasteaux expedition, are the main references for species selection.

The current landscape layout, established in 2004, comprises plantings designed to fit around and enhance Stephen Walker's Huon pine sculptural centrepiece.

Tasmanian East Coast Collection

Located at the northernmost point of public access in the Gardens, the Tasmanian East Coast Collection is a geographically focussed display representing species that naturally occur from Flinders Island in the north of the state to Tasman Peninsula in the south including East Coast hinterland regions. Its focus is on plants found in a diverse range of East Coast habitats including dry sclerophyll, dry grasslands, near coast, wet sclerophyll, riparian and sub-alpine vegetation types. The collection includes many species endemic to the region along with a selection of rare and threatened plants.

Foreshore

The Foreshore Collection is a geographically focussed display covering approximately half a hectare of Derwent River foreshore. The aim was 'to establish a visually strong horticultural planting of locally indigenous species in the degraded areas of the site while respecting and enhancing existing remnant vegetation' rather than attempt to rehabilitate or restore the area to a state resembling its original pre-disturbance condition.

The Subantarctic Island Collection

Opened to the public in October 2000, the Subantarctic Island Collection comprises a selection of the flora of the subantarctic region, with the emphasis on the plants of Macquarie Island. The house was designed to replicate the appearance and environmental conditions of Macquarie Island, Tasmania's southernmost territory. Plantings are segregated into various geographic and ecological zones and these differing environments are reinforced visually by a painted mural on the curved inner walls of the building.

Tasmanian Ericaceae Collection

Unfortunately a combination of site suitability issues and the presence of root rot have resulted in the difficult decision to de-access the Tasmanian Ericaceae Collection. The Ericaceae is a significant family in the Tasmanian flora with representatives in all major Tasmanian ecosystems. Tasmanian Ericaceae species will be significantly represented throughout existing and proposed collections.





Future Ambitions

During 2006 the RTBG engaged in a strategic master planning process that culminated in the development of future directions for living collection displays throughout the Gardens. This process was informed by ideas and opinions expressed through a comprehensive visitor and community survey. A desire for the Gardens to expand its Tasmanian native collections and associated programs was strongly evidenced in the survey results. The initial challenge for us was to identify a suitable area for redevelopment in a botanical garden that has a distinctly European feel with highly valued heritage collections occupying much of the grounds. It was decided, following a collections review, that areas of the northern region currently occupied by several displays in poor condition offered the best opportunity for future expansion. Our challenge has been to develop a display strategy that aims, through contemporary design, to develop strongly connected collection elements based on the concept, rather than recreation of habitats. Planning is well underway and determination of the broader areas where vegetation types are to be represented is close to being finalised. Once that process is complete we can move on to the development of a whole of site concept plan. This will ensure that individual Tasmanian native display elements are logically located in the landscape and spatially linked in a way that takes visitors on an interpreted journey of discovery through visually appealing and highly experiential collections. Our exciting Tasmanian Rainforest experience project provides some insight into our thinking regarding the future for Tasmanian native collections at the RTBG.

Tasmania is home to 95% of Australia's cool temperate rainforest. Cool temperate rainforests are staggeringly beautiful places with a fascinating and unique flora ranging from stately dominant tree species, many of which are endemic to Tasmania, to an incredibly diverse representation of non-vascular plants groups including mosses, lichens, and liverworts. Our objective is to create a globally unique Cool Temperate Rainforest Display that encapsulates the essence of a truly iconic Tasmanian vegetation type. This ecologically focussed collection will facilitate understanding of the ecological processes and biodiversity functions of Tasmania's cool temperate rainforest through the telling of stories about the variety and interaction of organisms that inhabit it. It is envisaged that a combination of bold plantings, realistic climate controls, clever interpretive approaches and a dramatically landscaped setting will conspire to create the desired 'sense of place' feel that is reminiscent of the cool temperate rainforest environment.

So, as we move beyond our bicentennial year there is still much work to be done in our endeavour to create a deeper understanding, appreciation and enjoyment of Tasmania's flora within the grounds of the Royal Tasmanian Botanical Gardens.

Seed Hunting in the Subantarctic – Cool!

Lorraine Perrins and Natalie Tapson

Lorraine has worked for a number of botanic gardens since starting in horticulture in 1985, including the Royal Botanic Gardens (RBG) Kew in the UK and the RBG, Sydney. She has worked at the Royal Tasmanian Botanical Gardens since 2005 and is Curator of the Conservation Collections and Subantarctic Flora.

Natalie has used her qualifications in horticulture and botany to follow her passion and work with plants. She has worked as a horticultural botanist at the Royal Tasmanian Botanical Gardens since 1997. Natalie has worked on Macquarie Island three times, in 2009, 2013 and 2017. She recently returned to Hobart after three months based on the Island harvesting seed for the Tasmanian Seed Conservation Centre.

Overview and Recap

Regular readers of the *Australian Plants* journal may remember a previous article written in 2014 regarding the Royal Tasmanian Botanical Gardens' (RTBG's) project to conserve the Macquarie Island Cushion Plant (*Azorella macquariensis*). Many APS members generously provided financial assistance for this project and we thought it fitting to provide an update for this Tasmanian Issue.

To recap, *Azorella macquariensis*, is endemic to Macquarie Island and is considered to be the keystone species of the feldmark (a plant community on the sparse plateau uplands which covers 45% of the Island). Since 2008 when a dieback of the population was noted it has undergone a catastrophic decline, resulting in it being listed as critically endangered by the Federal Government.

Research into the cause of the dieback involving scientists from Universities in South Africa and Canberra, the Australian Antarctic Division (AAD), the Biodiversity Conservation Branch of DPIPW and the Tasmanian Parks and Wildlife Service (TASPWS) indicates that it may be multifactoral and will not be resolved in the short term.

To prevent the total extinction of this remarkable plant it was deemed essential that a viable *ex-situ* collection be maintained on Macquarie Island and since 2010 a potted collection located on Wireless Hill, away from the infected natural population has been monitored and supported by the Australian Antarctic Division and the Tasmanian Parks and Wildlife Service.

The preferred method of maintaining the genetic diversity of a plant species is through banking its seed. The number of seeds required for a good, long term, conservation collection in a seedbank is typically





Azorella dieback on the plateau. Image: N.Tapson

a minimum of 10,000 harvested from more than 50 individuals per population per year. Achieving this for the *Azorella* is a considerable challenge in Macquarie Island's cold and windy climate when only two seeds are produced per flower.

Other issues relating to the health of the wild population, as well as the logistics of being on Macquarie Island when the seed is ripe and having enough time to harvest good quantities of seed, has impacted on our ability to achieve a good harvest to date. The *ex-situ* collection comprises 54 individually potted plants harvested from populations across the Island to capture the genetic diversity of this species and is also being utilised as a 'seed orchard' to harvest seed as well as collecting from the wild population.

Returning South

The RTBG were very fortunate that the Australian Antarctic Division granted a three month placement on Macquarie Island for the 2016/17 summer season and that RTBG Horticultural Botanist Natalie Tapson was willing to return to the Island to conduct the laborious task of harvesting seed. The task of harvesting tiny seeds in the "furious fifties" latitude is very challenging. The temperatures on the island during

summer range between 3 – 8°C, rain and snow are frequent and the wind constant. The average wind speed is 25 km/hr, with approaching fronts generating gusts up to 170 km/hr.

A. macquariensis has small seeds which are usually harvested using a pair of tweezers. Having previously visited "Macca", Nat was aware of the conditions and requirements of working in such a remote location, and has extensive seed collecting experience through her work with RTBG Seedbank Manager James Wood and the Tasmanian Seed Conservation Centre (TSCC).

In order to prevent deterioration before its return to Hobart any seed harvested must be cleaned and dried sufficiently in a cool environment to ensure that it does not develop mould or begin to rot. Not an easy task on an island known affectionately as "The Green Sponge"! To facilitate this, drying trays, 30 kilos of silica gel desiccant and three air-tight containers were shipped to the island to be utilised for this purpose.

The optimum time for harvesting seed of *Azorella* is March/April, and an added advantage of having Natalie based on the island during the summer period is that she has also been able to harvest seed from the other plant species which we currently do not hold in the TSCC, ensuring that we are working towards securing the plant diversity of the entire island's flora.



Natalie collecting *A. macquariensis* seed

Image: N.Tapson

Seed collecting in the Subantarctic is not for the faint-hearted, and the constantly changing weather patterns have made the job very difficult. An extract from an email from Natalie sent from the Island gives some idea of what she was up against -

"Just got back from a couple of days in the field. Weather was mild yesterday and I collected seed from another 47 Colobanthus musciodes plants growing on the rockstacks at Sandy Bay despite a couple of unhappy elephant seals not being very keen to have me edging past them! Weather changed overnight, I had planned to sample some Poa cookii this morning but only managed 20 plants in about half an hour as the wind was blowing straight down the valley and showers of rain kept whipping by. The walk back across the Plateau was interesting, a strong westerly was blowing 30–35 knots at the station when I got back, (which probably meant it was 40 knots on the plateau). I had a decidedly westward lean for some time after I got back, but that's what Macca is all about!"

We will not know the outcome of Natalie's efforts until the seed is returned to Hobart and processed at the TSCC in the coming months. It may be that further seed collections may be required in order to store enough seed for future use, however we can be sure that any collections that are deposited into the Seedbank will be welcome and provide an insurance collection of these species into the future.

The RTBG acknowledges the support for this project by the Australian Antarctic Program.

If you would like to learn more about this project, please go to – gardens.rtbg.tas.gov.au/azorella-macquariensis



Flora of Four Parks in the Hobart region

Bruce Champion

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The flora covered in these Parks articles may be referenced in Tasmania's Natural Flora, 2nd edition, 2012, edited C. Howells, Australian Plants Society Tasmania Inc. Hobart Group

Wellington Park

Mount Wellington is a wonderful asset to the City of Hobart and loved by Hobartians. It has a very wide diversity of plants with over 500 indigenous plant species including over 80 endemics (E). Wellington Park encompasses Mount Wellington and a range of slightly smaller mountains extending westward over an area of some 18,250 ha.

Walking tracks crisscross the city (eastern) side of Mount Wellington and fire trails and more walking tracks traverse the range. In the early days, many people made the Mountain their alternate home and built rustic huts near some of the steams. The Pinnacle Road to the summit was constructed during the 1930s depression, and provides easy access for all vehicles except on a few heavy snow days, and then, after City of Hobart snowploughs have done their work, access is again available.

The diverse natural flora on the Mountain ranges from dry sclerophyll forests though wet sclerophyll and sub-montane plant communities. On the lower slopes, *Cassinia aculeata* and *Goodenia ovata* and many common *Acacias* are present. *A. verticillata* subsp. *verticillata* spans all



Acacia riceana



Aristotelia peduncularis fruit



Westringia angustifolia



sclerophyll areas, but *A. leprosa* var. *graveolens* is in the wetter areas, while *A. riceana* (E) usually frequents stream and river sides.

Tall *Eucalyptus obliqua* and *E. globulus* shade many lower tracks and the understorey is of *Bedfordia salicina* (E), Tasmanian blanketleaf. This species has become dominant since the 1967 bushfires and has, in large areas, formed a dense canopy of foliage, shading out most of the lower understorey. However, many older *Bedfordias* are dying, opening up the canopy and allowing new understorey plants to grow. *Olearia argophylla*, *Pomaderris apetala* subsp. *apetala*, *Leptospermum lanigerum*, *Correa lawrenceana* and *Aristotelia peduncularis* (E) are all species that are found along the tracks and trails in the wetter areas.

One species found along a dry section of the Pipeline Track is *Westringia angustifolia* (E), a rare species that makes an excellent garden plant. Higher up, other wet sclerophyll species may be seen, such as *Prostanthera lasianthos* and *Pittosporum bicolor*. Several other species grow in abundance, including *Cyathodes glauca* (E) with strongly scented white/cream flowers and white/pink/purple, flattened, round, fruit and *Richea dracophylla* (E) with terminal spikes of cream/white, 'rice grain' like flowers.

Up the Pinnacle Road, near the Chalet at 1,000 m, another very rare plant glows bright yellow in mid-summer, *Centropappus brunonis* (E). Another daisy species found around here is *Ozothamnus antennaria* (E), an erect bush with crowded off-white flowers contrasting with bright green leaves that are sticky when young. A couple of pea family species are also found here and elsewhere. *Oxylobium ellipticum* has clusters of aromatic yellow flowers with red centres. *Pultenaea juniperina* also bears yellow pea flowers, and being rhizomatous, tends



Richea dracophylla



Veronica formosa



Centropappus brunonis



Pimelea sericea



Bellendena montana fruit



Euphrasia striata

to grow in thickets. Another species, also possibly rhizomatous, in the Chalet area and beyond is *Veronica formosa* (E).

Further up the Pinnacle Road many more sub-montane species abound, and the area around Thark Ridge is rich in summer flowering species. *Eucalyptus coccifera* (E) is the tallest.

Some smaller plants are *Olearia pinifolia*, *Ozothamnus ledifolius* (E), with crowded heads of cream/white flowers near the end of the stems, and *Pimelea sericea* (E). *Bellendena montana* (E) has tall stems topped with clusters of white to pink flowers followed by flattened, pendulous, papery follicles. Two *Richea* species are present in the sub-montane areas, the very prickly, bushy *R. scoparia* (E) with white to red flower spikes and, *R. sprengelioides* (E) that has terminal clusters of cream/yellow flowers. Some of the prostrate, rock-hugging species growing in this area are *Exocarpos humifusus* (E), a hemiparasitic species, and *Pentachondra involucrata* (E) with hairy white flowers.

Tracks leading beyond the summit carpark provide excellent examples of montane flora, including dense bushes of *Orites acicularis* (E), distinctive with their yellow/green needle foliage and sparse white flowers, *Olearia ledifolia* (E), *Acrothamnus montanus* with clusters of white, tubular, terminal flowers, *Pentachondra pumila* with small clusters of hairy white flowers and red fruit, and *Oxalis magellanica* with delicate white five petal flowers. Three *Euphrasia* species may be seen here, *E. collina* subsp. *diemenica* (E), *E. gibbsiae* subsp. *wellingtonensis* (E) and the beautiful *E. striata* (E).

Tasman National Park

Tasman National Park covers a large amount of the eastern and south eastern coastal areas of the Forestier Peninsula and the eastern, southern and north western tip of Tasman Peninsula in south eastern





Tasmania. Much of the area is populated by 'cloud rainforest' (wet eucalypt) species, more common at higher altitudes than along its coast line. Of course, the Tasman Peninsula is more famous for the convict ruins at Port Arthur and, more recently, the first two sections of the Three Capes Track.

Forestry on the Forestier Peninsula is less active now and much of the interesting flora is not easily accessible without a good 4WD vehicle, especially to areas such as High Yellow Bluff and MacGregor Peak. Here, species such as the beautiful endemic (E) *Olearia archeri* may be found. This rhizomatous species is a fire survivor and makes a fine



Olearia archeri



Cyathodes platystoma fruit



Boronia pilosa subsp. *tasmaniensis*

garden specimen in suitable soil. Other species found in the wet eucalypt forest areas here are *Cyathodes platystoma* (E), *Anopterus glandulosus* (E) and *Richea dracophylla* (E).

While the rugged coast of the Forestier Peninsula is not easily accessible, the Tasman Peninsula, with its geologically fascinating east coast, has vehicular and walking access from Tasman Arch to Fortescue Bay. It also has magnificent boat trips that enable passengers to view, close up, many of the wonderful coastal features. *Eucalyptus tenuiramis* (E) is the dominant tree around Tasman Arch with understorey of *Pultenaea juniperina*, *Acacia genistifolia*, *Calytrix tetragona*, *Hakea teretifolia*, and beautiful *Pentachondra involocrata* (E). The very floriferous *Boronia pilosa* subsp. *tasmanensis* (E), *Epacris lanuginosa* and *Styphelia adscendens* are some of the species that occur around nearby Devils Kitchen.

The Waterfall Bay Track follows the coast from Tasman Arch and Devils Kitchen, past Patersons Arch to Waterfall Bay. West of the track is a *Eucalyptus obliqua* forest with understorey of *Goodenia ovata*,

Hibbertia acicularis, *Pomaderris elliptica* var. *elliptica*, *Sprengelia incarnata* and other species. On the coastal side many other plants occur: *Correa alba*, *Coprosma quadrifida*, *Pimelea drupacea*, *Zieria arborescens* subsp. *arborescens* and *Drymophila cyanocarpa* to name a few.

From Waterfall Bay the Tasman Coastal Trail continues south to Fortescue Bay passing through copses of *Richea dracophylla*, *Allocasuarina verticillata* and many of the afore-mentioned species with *Eucalyptus globulus* and *E. obliqua* forests overhead. Two other walking tracks start or finish at Fortescue Bay, the Cape Haug Track with its thousands of dolerite steps, and the 1980s Cape Pillar Track.

This older section of the Cape Pillar Track is exceedingly floriferous in late spring/early summer with *Bedfordia salicina* (E) resplendent with yellow daisy heads, forming a canopy over *Xerochrysum bracteatum*, *Hibbertia appressa*, *Epacris impressa*, *Monotoca glauca*, *Pultenaea gunnii* subsp. *gunnii* and *Gonocarpus teucroides*. *Pimelea nivea* (E), Bushman bootlace, is also found here. It is so called because pulling a stem off the trunk results in a long, very strong length of bark, suitable for a bootlace.

All along the lower part of this Track, *Billardiera longiflora* adorned with large purple fruit in summer, clammers over the bushes. *Cassytha pubescens* also clammers over tussocks and bushes, using its haustoria to extract nutrient from *Lepidosperma concavum* and any other plant it can wrap itself around. Along the sides of the Track, *Lycopodium deuterodensum* is common among *Dianella tasmanica*, another plant with blue/purple summer fruit. *Drymophila cyanocarpa* and its turquoise fruit is also found here.



Pimelea nivea



Epacris marginata



Pentachondra involocrata





Remarkable Cave, south of Port Arthur, has some interesting plants. Here, the plants of *Acacia verticillata* are excellent examples of leaf gigantism¹, caused by coastal exposure. The foliage is more dense and the leaves larger and thicker due to salt water spray and salinity. This phenomenon may also affect *Epacris marginata* (E) and *Allocasuarina monilifera* that grow along the sandy track from Remarkable Cave to Crescent Bay.

Reference

1. Blackman C.J., Jordan G.J. and Wiltshire R.J.E., 2005, *Leaf gigantism in coastal areas: morphological and physiological variations in four species on the Tasman Peninsula, Tasmania*, Australian Journal of Botany, **53**, 91–100, CSIRO PUBLISHING

Hartz Mountain National Park

Hartz Mountain National Park, encompassing only 7,226 ha, is one of the smallest Tasmanian national parks, and in 1989 was included in the Tasmanian Wilderness World Heritage Area. It has a large diversity of wet sclerophyll, sub-montane and montane species including many endemic Tasmanian species. On the drive up Hartz Road the taller vegetation is mainly *Eucalyptus regnans*, *E. obliqua*, *Acacia melanoxylon* and *Nothofagus cunninghamii* with clumps of *Gahnia grandis*, *Dicksonia antarctica*, *Blechnum wattsi* and other understorey species. Occasional *Prostanthera lasianthos* and the famous *Eucryphia lucida* (E), Leatherwood, brighten the vegetation in summer. Higher up the road, as the trees thin out, the understorey thickens with *Melaleuca squamea* in the wetter areas, joined by *Leptospermum lanigerum*, *Tasmannia lanceolata* with its strong, pepper-flavoured, red maturing to black, berry fruit and *Anopterus glandulosus* (E). Along a wet rock face with a small waterfall, *Prionotes cerinthoides* (E), Climbing heath, may be found flowering. Into the National Park, and just 1 km before the Waratah Lookout and picnic shelter, tall bushes of *Agastachys odorata* (E) glow with cream/white flower spikes in summer and *Comesperma retusum*, Mountain milkwort, catches the eye with pink/purple bunches of flowers on the verge below. *Telopea truncata* (E) may be seen flowering from the cliff top 'Waratah Lookout'. The nearby picnic shelter is a pleasant place for meals in inclement weather, with *Eucalyptus subcrenulata* (E) and *Acacia riceana* (E) providing wind protection. Hartz Road then descends into a dip as it crosses the upper catchment of the Arve River. *Melaleuca squarrosa*, *Leptospermum lanigerum* and *L. nitidum* (E) all thrive here with *Boronia citriodora* subsp. *citriodora* (E). Tiny purple flowers of *Utricularia monanthos* appear in waterways throughout the dip. More sub-montane Proteaceae species including



Agastachys odorata



Eucryphia lucida



Telopea truncata

Cenarrhenes nitida (E), *Hakea lissosperma* and *Orites revolutus* (E) line Hartz Road to its end.

There is a large Visitor Information Shelter here. Two main tracks radiate from the carpark. Hartz Peak Track leads south past Lake Esperance and Ladies Tarn to Hartz Mountain summit at 1,254 m. The western track rises gently then dips down to Lake Osborne.

Hartz Peak Track dips from the Visitor Shelter through *Telopea truncata*, *Leptospermum lanigerum*, *Eucalyptus coccifera* (E), *Bauera rubioides*, *Gahnia grandis* clumps and *Empodisma minus* which clammers through the vegetation. The Track then rises gently past summer-flowering *Eucryphia milliganii* (E) with smaller leaves and flowers than *E. lucida*. The Track also passes *Orites diversifolia* (E), a species with entire, notched tipped and/or serrated leaves.

The Track rises through rock steps and cording to boardwalks across a gently, northerly, sloping plateau where many summer flowering plants crowd. These include *Epacris serpyllifolia*, *Richea scoparia* (E), *R. sprengelioides* (E) and *Olearia ledifolia* (E). In the drainage ditches along the track, *Drosera arcturi* has solitary white flowers among its red sticky hairy leaves. In wet areas, often in water, *Milligania densiflora* (E) is very obvious with its large, crowded, panicles of cream/white tubular flowers that require a cold period for initiation. In the distance small copses of *Richea pandanifolia* (E) are too far away for the flowers to be easily seen among the palm like leaves.

Along the side track near Lake Esperance, excellent specimens of *Donatia nova-zelandiae* (threatened species) feature white, five petalled, star-like flowers in the hard surface of bright green, fleshy, pointed leaves. Nearby, the rare and unique *Eucalyptus vernicosa*, the smallest of all the eucalypts, grows in a couple of copses beside

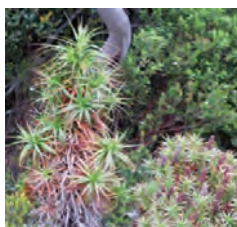




Donatia nova-zelandiae



Tetracarpaea tasmanica



Richea xcurtisiae

the Lake. Hartz Peak Track continues through this beautiful wet, sub-montane heathland then, just past Ladies Tarn, climbs steeply to a higher montane plateau before the rocky climb to the summit of Hartz Mountain.

The Lake Osborne Track from the Visitor Shelter passes through a beautiful grove of *Eucalyptus subcrenulata* and small *Nothofagus cunninghamii*. An interesting fungus, *Cyttaria gunnii*, Myrtle orange, is an edible ascomycete fungus that is a specific parasite of Myrtle beech trees and may be seen on some of the trees in this grove. Two rare *Richea* species or sub-species are found here. *Richea xcurtisiae* (E) the hybrid between *R. pandanifolia* and *R. scoparia* is found in two locations. The rare species, *R. milliganii* (E) is a slight, straggly plant with cream/yellow terminal, nodding clusters of flowers that hang at 45° among the crowded foliage.

Another beautiful species found near Lake Osborne is *Tetracarpaea tasmanica* (E) and nearby the beautiful *Prionotes cerinthoides*, with its pink/red bell flowers in late summer, clambering over other plants along this track, including *Monotoca submutica* var. *submutica* (E). Small plants of *Euphrasia gibbsiae* subsp. *gibbsiae* (E) raise their delicate clusters of prominently striped white flowers above clumps of *Ozothamnus rodwayi* var. *rodwayi* (E) with their terminal clusters of white daisy flowers and distinctive brown bracts.

Mount Field National Park

Mount Field National Park, about an hour's drive northwest of Hobart, is Tasmania's oldest National Park, celebrating its centenary on 29 August 2016. It presents a wide diversity of plant species for enthusiasts. From late in the nineteenth century, Hobartians have visited to picnic, hike and explore this wonderful park that was set aside from Eucalypt forests along what is now the Gordon River Road. Several walking tracks to nearby waterfalls and a tall timber forest are accessed from the Visitor Information Centre.

Lake Dobson Road, commencing at the Visitor Centre, passes through tall forests of *Eucalyptus obliqua*, *E. regnans* and the endemic *E. delegatensis* subsp. *tasmaniensis*, all with understoreys of *Dicksonia antarctica* and smaller ferns. The tall, buttressed, *E. subcrenulata* (E) soars over rainforest species, including *Athrotaxis selaginoides* (E), *Atherosperma moschatum*, *Anopterus glandulosus* (E), tall *Phyllocladus aspleniifolius* (E) and *Anodopetalum biglandulosum* (E). *E. urnigera* (E) forms an avenue as the road continues toward Wombat Moor past Lake Fenton. All trees decrease in size approaching Lake Dobson. Here *Eucalyptus coccifera* (E) dominates to the tree line.

As the road emerges from the tall forest area, it passes into sub-montane woodland and soon arrives at the Subalpine Forest Walk where the deciduous *Nothofagus gunnii* (E), *Fagus*, forms beautiful thickets. More *N. gunnii* may be seen along the famous Tarn Shelf accessed from around the ski fields above Lake Dobson.

At Wombat Moor, there is a large display of sub-montane species easily accessible from the roadside and from the boardwalk on the Lakes Belton and Belcher Track. The small conifer, *Pherosphaera hookeriana*



Boronia citriodora subsp. *citriodora*



Prionotes cerinthoides



Richea pandanifolia subsp. *pandanifolia*





(E), the aromatic *Boronia citriodora* subsp. *citriodora* (E) and *Astelia alpina* var. *alpina* are a few of the species found here. The unique *Abrotanella forsteroides* (E), one of Tasmania's several montane cushion plants, grows in many locations in the higher areas of the Park and here on Wombat Moor with Epacridaceae species *Pentachondra pumila*. Several other cushion plant species are found in the montane areas of the Park: *Pterygopappus lawrencii* (E), *Donatia novae-zelandiae* (T) and *Dracophyllum minimum* (E).

Tasmania has an abundance of Epacridaceae species and there are many at Mount Field. *Cyathodes glauca* (E) bears very aromatic white/cream flowers and cheese shaped drupes of many shades of purple, prickly *Richea scoparia* (E) is wide-spread. In shadier places, small bushes of *Trochocarpa thymifolia* (E) are festooned with tiny pink, pendulous spikes of flowers. *Leptecophylla juniperina* subsp. *juniperina* is found in lower woodland areas and *L. juniperina* subsp. *parvifolia* (E) in the higher areas.

However, the 'pièce de resistance' in the Park is *Richea pandanifolia* subsp. *pandanifolia* (E), Pandani, arguably the world's tallest heath plant. This species is found in abundance along the north-west corner of the Pandani Grove Nature Walk (PGNW) around Lake Dobson. These remarkable plants grow usually with a single slender trunk to 10 m tall, and 1 m long palm like leaves that persist, leaf tips curling as they dry, to form an attractive skirt. Bunches of white/pink, summer flowers, maturing to deep pink, are often inconspicuous amid the upper leaves. Their fused petal caps drop off to reveal the white stamens. A little more to the north, along the PGNW, is a magnificent *Athrotaxis cupressoides* (E) copse.

The rarer *Richea xcurtisiae* (E) is also found along the PGNW and in the sub-montane woodland along Lake Dobson Road. Another superb Epacridaceae species, *Prionotes cerinthoides* (E) with beautiful pink/red tubular, pendulous flowers in summer is found in shadier areas, especially along the lower sections of the Old Pack Track that has been restored from the Lake Nichols Track to Lake Fenton. This Old Pack Track was the only way early 20th century visitors, some complete with formal dress clothes, could access the ski fields, and places like Twilight Tarn, for skating and skiing parties.

The family Asteraceae is well represented in the Park. Two species found on Wombat Moor are *Craspedia macrocephala* (E) and *Leptinella filicula*. At least twelve *Olearia* species are found in the Park: *Olearia argophylla*, *Olearia persoonioides* (E) and *Olearia phlogopappa* subsp.



Olearia pinifolia



Campynema lineare



Richea pandanifolia mature flowers

subrepandra (E) are all found along the Lake Dobson Road in the forest areas, while *O. pinifolia* (E) and *O. stellulata* are both near and/or in the Subalpine Forest Walk, and the former is also along the PGNW.

Species of the Proteaceae family also feature widely in Mount Field National Park. *Banksia marginata* is wide-spread from dry sclerophyll areas to over 1,000 m in sub-montane woodland. A number of endemic species are common throughout the Park: *Hakea epiglottis* subsp. *epiglottis* with its distinctive 'S' shaped woody follicles is generally found in wet heaths and *Lomatia polymorpha* with its variable leaf shapes, is common. Three species of *Orites*, *O. acicularis*, *O. diversifolius*, another species with variable leaf shapes, and *O. revolutus*, perhaps the most widespread *Orites* species, are also throughout the Park. The Tasmanian waratah, *Telopea truncata*, is found in the sub-montane areas and, though commonly red flowering, a yellow flowering form has been found in State Forest nearby.

The Park also has its share of smaller species: *Schizacme archeri* with leathery leaves and *Campynema lineare* (E), a superbly beautiful, little flower with six green tepals, sometimes burgundy tipped, and with anthers, orange golden when coated with pollen and deep pink after the pollen has shed, may be found along the 'floriferous' PGNW.

These have been only a few of the beautiful species to be seen in these four Parks. It will be a pleasure to share more with *Australian Plants* readers in the future.

All photographs in this article are by Bruce Champion



