



December 2016

ANN Special

Alice Springs Field Naturalists Club Newsletter



Star of Bethlehem, *Calectasia narragara* is a woody perennial which has a rhizomatous root and forms clumps. With a Christmas name like that, I couldn't resist putting it on the December newsletter cover. One of the stunning flowers enjoyed by ANN get-together participants in WA.

Photo: Rosalie Breen

Next meeting will be held Wed 8 Feb 2017 at 7:00 PM at Higher Education Building at Charles Darwin University.
The next newsletter will be published in February 2017.
Please ensure photos and articles get to Barb by 28 January 2017. bjfedders@gmail.com

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The Australian Naturalists Network get together in October 2016 was hosted by Western Australian Naturalists' Club.

ANN experience of Western Australia

by Jocelyn Davies

The Western Australian Naturalists' Club hosted ANN 2016 with aplomb. ANN stands for Australian Naturalists Network,² which has a get together every two years. ANN16 was held from 1st to 10th October together with a great offering of pre-and post-tours. Just over 80 people attended ANN16 and another 25 or more local people were involved as guides and evening speakers. It was a great credit to the organisers that the itineraries for each day's field trip went so smoothly. As far as I know, no one missed a bus and no one missed out on lunch, and the special food requirements and requests of various people were all met happily.

The ANN symbol, an Echidna, is a good choice because, like many naturalists, Echidnas are somewhat cryptic as well as quirky. Also like naturalists they are found all over Australia in diverse habitats. Interstate ANN16 participants came from Tasmania (where the previous ANN was held), Victoria, and Queensland including a big contingent from Chinchilla where the ANN10 was held. From Alice Springs Rhonda Tomlinson, Rosalie Breen, Charlie Carter, Deb Clarke and I participated. Leoni Read, who is now living in Tasmania, was also given honorary Alice affiliation by the rest of us. It was notable that four of the five current Alice residents who participated in ANN16 live in the same street – one could be forgiven for concluding ours is a very small town.

South West WA is a botanical province with high endemism and a great proliferation of plant species. The meeting was well timed for spring flowering and this spring was cool with plenty of rain. This helped to ensure that the floral displays were superlative. Each day of the gathering had field trips in which we were introduced to a great cross section of the local floral diversity, as well as to reading the landforms and understanding the deep geological time span of the region. Most participants stayed at the Woodman Point Recreation Camp, which once quarantined passengers off ships who arrived in Fremantle with notified communicable diseases. We were comfortably accommodated two to a room with shared bathrooms, although elephants heard tromping the corridors at night were sometimes a little disturbing.

Perth sprawls along the coast – lots of its new suburbs have chased sea breezes and sea views. Our first day was in coastal vegetation remnants in northern Perth in the satellite city of Joondalup. Coastcare groups, chaired by Dr Marjorie Apthorpe and the ANN16 Treasurer Don Poynton, are working tirelessly to conserve and manage a narrow coastal strip that includes Banksia woodlands recently recognised as an endangered ecological community; Melaleuca heathlands; and good habitat for



Banksia grandis, which is a tree growing up to 10m high, in coastal woodland adjoining Perth's northern beach suburbs

Fairy-wrens and Quendas (just one of the local mammal names we learnt: the Southern Brown Bandicoot, (*Isodon obesulus*). Judging by the number of walkers and joggers on the footpaths that the local council has built through the coastal reserve, this thin green line of bushland is much appreciated by many. When people in the multi-million dollar 'mcmansions' that are closest to the coast are suspected of chopping trees down to improve their view, council erects billboard-sized signs in front of their houses asking anyone with information on tree vandalism to report it. I liked that. Nevertheless, more and more and more of the small coastal bushland areas—whether or not they contain threatened ecological communities—are disappearing under new suburbs on the one hand, coastal erosion on the other, and multiple weed species in-between. Not to mention *Phytophthora dieback*.

Phytophthora cinnamomi is a colourless microbe, a fungus that lives in soil and in plant tissues and also can move around in water. A serious plant pathogen worldwide, it almost certainly was introduced to WA shortly after colonisation. It kills trees and shrubs. Plants in the family Proteacea (including all those endemic WA Banksias) and Jarrah (*Eucalyptus marginata*) are among the most susceptible but over 40% of native plant species in South West WA are considered to be at risk. *Phytophthora* is a very serious problem in WA's most humid climates (>800mm pa), in parts of the South West. Its impact in these regions is exacerbated when plants are drought-stressed. It is also a serious problem in moist micro habitats of drier regions, such as in run-on areas around the base of the granite rocks that emerge along the Darling escarpment and in the southern wheat belt. No cure exists although

²<https://australiannaturalistsnetwork.wordpress.com/>

injections of phosphite, a salt of phosphoric acid, have been found to protect individual plants. This is ironic given that phosphorus toxicity characterises some of the more susceptible plants, which are adapted to growing in very low P soils. However phosphite injections are obviously not a broad-scale solution and WA is doing a lot to educate people and to manage the spread of dieback³.

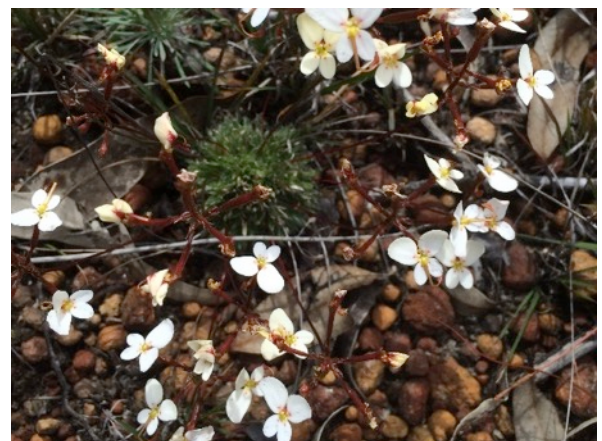
In many of the bushland areas we visited, our vigilant guides and bus drivers set up boot cleaning stations. Still, we wondered how effective this is, especially since many visitors to these places would not take the same precautions. In any case, the organism is spreading autonomously, even uphill at a meter a year via root to root contact between infected plants, and faster downhill due to water flows⁴. How much will forests and understories change as this dieback spreads and special plants are lost?



This unhealthy Banksia, on a hillside in the Ellis Brook valley, looked to be suffering Phytophthora dieback. It was close to a boot cleaning station and I wondered if the pestilence had already spread past that biosecurity measure

On the second ANN day we travelled over the Darling escarpment to Wongamine Nature Reserve, 200 hectares of woodland growing in the lateritised soils formed in the deeply weathered granites of the Yilgarn Craton. More than 200 species of native plants grow in the reserve, which is a bush remnant surrounded by rolling hills that are pretty much cleared of native vegetation, growing Wheat and Canola. The understory, below Wandoo and Powder Wandoo (*Eucalyptus wandoo* and *E. ascendens*) and seven other Eucalypts, had a huge diversity of plants all in full flower showing off pinks, yellows and oranges. Proteaceae species growing there included five Grevilleas, seven Hakeas and ten Banksias while there were five Hibbertia species (Guinea Flowers) and nine Gastrolobium species (Peas/Poison peas). The ground cover was also a treat with myriad kinds of Orchids, loads of different Drosera and Trigger Plants (*Stylidium* spp). Apparently, 150 species of Trigger Plant occur in southern WA. No wonder there seemed to be no end to their diverse and elegant forms and colours.

(Two Trigger Plants pictured here in Wongamine Nature Reserve)



³ For example, see <https://www.dwg.org.au/>

⁴ Department of Conservation and Land Management. 2003: *Phytophthora cinnamomi* and disease caused by it. Vol 1: Management Guidelines. https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/disease-risk-areas/Phytophthora_cinnamomi_and_disease_caused_by_it_Vol_1_Management_Guidelines_.pdf



Toodyay naturalist and farmer Brian Foley with an orphaned juvenile Woylie (Bettongia ogilbyi) that he has been hand-rearing

One other highlight of this day was the morning and afternoon tea catered by the CWA in the nearby old, community-spirited town of Toodyay. Needless to say the treats were abundant and very tasty. While enjoying CWA cakes, we were visited by an orphaned Woylie (Brush-tailed Bettong, *Bettongia ogilbyi*) and a Black-gloved Wallaby (*Macropus irma*) who were both being raised by Toodyay naturalists and farmers Brian and Chris Foley.

Another mammal highlight of the day almost slipped through unremarked, except by Alice people. When Leoni Read found some scat that contained termite remains, she asked one local guide if they might be numbat (*Myrmecobius fasciatus*).

"I wish", he said, "but they are Echidna".

A little later, Leoni showed Charlie Carter the scat. Charlie was adamant they were not the very distinctive-shaped scat that Echidna make. I heard the story later that night and then showed Leoni and Charlie a photo of Numbat scat I had collected some weeks earlier in Boyagin Rock Nature Reserve, about 150 km east of Perth, which includes a reintroduced population of Numbats. Leoni and Charlie agreed that the scat that she had found really did look like it was from a Numbat. Perhaps the persistence or re-colonisation of Boyagin by Numbats is not as far-fetched as it might seem given that the Woylie that Brian and Chris Foley were hand-rearing was an orphan from a population that had persisted in the



Scat left by foraging numbats, Boyagin Rock Nature Reserve (but note that the left-most scat is less definitely Numbat than the others). The Numbat is WA's fauna emblem and was the emblem for ANN16. Numbat, or Walpiti in Yankunyatjatjara and Pitjantjatjara, used to also occur in central Australia.

area, against all odds. Also the Wandoo/Powder Wandoo open forest in Wongamine NR is prime Numbat habitat!

Tuesday was our trip to Rottnest Island. The voyage took about half an hour on a high-speed passenger ferry from Fremantle, with the distant company of some Humpback Whales. We split into two groups to either bus around the island or walk, swapping activities in the afternoon.



Quokka, Rottnest Island. Cuteness factor: extreme.

My highlights while walking in a small group with Mike and Mandy Bamford and looking out for birds included a very close up study of a Western Gerygone, and the sight of a pair of Shelducks with a grand total of 18 half-grown young. Mike suggested that the Shelduck pair might have collected some of this brood from other Shelduck nests, though we wondered why they would do this. To boost their prestige with the other Shelducks? Or as insurance in case some of the young are predated?

Walking around also gave us a chance to observe the island's Quokkas (*Setonix brachyurus*) up close. Quokkas also persist in one or two places on the mainland but are hard to see, whereas on the island they are not at all shy. Early Europeans described the island as densely wooded Cypress Pine (*Callitris preissii*), Teatree (*Melaleuca lanceolata*) and Tuart (*Eucalyptus gomphocephala*), but much of the island is now a low heathland, maintained by Quokka grazing. Quokkas have to be fenced out where tree revegetation is in progress. A hurried bus trip around the island's 25km perimeter road enabled us to also see its NZ Fur Seal colony, rocks where Australian Sea-lions haul out, and pair of Osprey on the nest they have used for many years which is a cone of interlocked sticks more than a metre high on a windswept rocky promontory.



Getting up close with a rescued Red-tailed Black Cockatoo at Kanyana Wildlife Rehabilitation Centre. These big gum nuts, from Marri trees (*Corymbia calophylla*), are food for several parrot species each of which leaves a different pattern of chew marks.

Wednesday was a 'rest day' with local walks in the morning close to Woodman Point, and a visit to Kanyana Wildlife Rehabilitation Centre in the afternoon/evening. This busy not for profit centre was established by volunteers and continues to depend of volunteers and donations for its work in treating hundreds of orphaned and injured animals each year. One of their ancillary functions is education for which they keep a small number of animals that are not fit for return to wild living. For us, as for hundreds of school kids each year, it was a chance to see some special species, including Red-tailed Black Cockatoo, Echidna and Tawny Frogmouth, up very close. Kanyana also manages two breeding programs for endangered species, Bilbies and Woylies, as part of implementation of national recovery plans. Animals bred here are used in the restocking of those WA conservation reserves, where introduced predators are being controlled, efforts that are extensive and apparently well-resourced on both government-managed and privately-managed nature reserves in WA.



In the following days we visited several bushland reserves close to Perth. Some were on the old podsolised Bassendean sand dunes and in the perched wetlands of these and younger more coastward dune systems. Others were in the granites and lateritic soils of the Darling scarp and its foothills. One highlight for me was in the Ellis Brook Valley: a great show by a Square-tailed Kite being harassed by a Goshawk. The valley also lived up to its reputation as a fantastic place for wildflowers. Another highlight was learning when a Xanthorrhoea is not a Xanthorrhoea – the answer is when it's a Kingia! The leaves and trunk of *Kingia australis* look very much like *Xanthorrhoea* species, which are extremely common in the bushland around Perth. But the Kingia is not closely related, being in the endemic Australian (predominantly Western Australian) family *Dasyopogonaceae*.

Kingia australis, whose leaves and trunk resemble *Xanthorrhoea* spp but which is not closely related and has very different, 'drumstick-shaped' flowers.

In the field we learned from people who were both naturalists and specialised research scientists. In one Banksia woodland remnant, surrounded by suburbs and a prospective industrial development, we learnt from plant physiologist Dr Hans Lambers about mechanisms that enable Banksias to prosper in extremely nutrient poor soils. Adaptations include channelling all the available phosphorus into building the structure of new shoots and leaves. Activation of chlorophyll production and photosynthesis is delayed in those new tissues, hence they show red colour. The next day, in WA's oldest protected area, John Forrest National Park, geologist Mike Freeman gave a great explanation of the development of the lateritic profile of the Darling Scarp during millions of years of weathering of the Yilgarn Craton granites. He then guided walkers in how to interpret the parks' geological features en-route to one of the two waterfalls we visited that morning. Mike lived and worked in Alice Springs for a decade and some might remember him.



From left: Two of the three species of Feather Flower (Verticordia spp, in Myrtaceae) that grow in the Ellis Brook valley. The flowers of V. huegellii start out white and turn pink after fertilization; Chorizema ilicifolium (Holly Flame-pea) in John Forrest National Park; Lechenaultia biloba in Wongamine Nature Reserve

Field trips on this ANN were complemented by fabulous evening talks by experts in their field. Kingsley Dixon, former director of Kings Park Botanical Gardens, opened the get together with a photographic exploration of the drivers of WA's extraordinary biodiversity. Later in the week, David Knowles presented amazing photo-montages of invertebrates and some living samples; and Ron Johnstone introduced us to the world of WA's three species of Black Cockatoos, their adaptations and serious challenges for their future prosperity including competition for nest sites from other parrots and feral bees.

The week wound-up with visits to some Perth icons including Kings Park, where much of the spectacle of diverse WA endemics in rampant flower is conveniently arranged in families. Another visit was to the Shipwreck Gallery of the WA Museum in Fremantle. Its display of salvaged boat timber and relics from the Dutch East India Company ship *Batavia*, which ran aground on the Houtman Abrolhos Islands in 1629, book-ended the experiences that Rhondda, Charlie, Deb and I had had when we visited the Abrolhos Islands on an ANN16 field trip in the last week of September. The story of the massacre of more than a hundred *Batavia* passengers by some of the ship's crew—mutineers—on an island in the Abrolhos archipelago is well known to Western Australians. Most of the rest of us only knew the story dimly, if at all, which served to remind us that WA is different to more eastern parts of Australia historically, socially and culturally, as well as biologically.

A continuing committee was elected during the week to take ANN forward to the next get together, in Victoria in two years time. Jeff Campbell was elected as Chair. Since none of us present from Alice nominated for the committee, there remains an opportunity for others from Alice, or Darwin or elsewhere in the NT, to do so. Most of the work of organising the ANN falls to the host state/local groups with the national committee providing oversight and continuity. In other words, the role of NT representative is not likely to be onerous.

For all its great experiences and good organisation, I felt there was a missing element at ANN16, which was encouragement and opportunity for those present to think collectively about the future of ANN. There is no doubt that it is an aging network, which means it has a short future unless younger people join in. There are plenty of younger people involved with the natural environment but they are less involved with naturalist groups and more with conservation action, environmental advocacy, bushwalking, bird watching and in para-professional roles. ANN16 was a missed opportunity for participants to share their thoughts about whether and how the network could be broadened, strengthened and rejuvenated.

WHERE TO NEST ...

OR WHERE NOT TO NEST?

By Rhondda Tomlinson

Being birds, you would think it would be easy to find a suitable nesting place in such a remote area as the Abrolhos Islands off Geraldton, Western Australia.

However, Wooded Island as you can see, is a bit crowded.



East Wallabi Island seemed a good possibility but the signs for visitors to read said that this nest (which is just a bump on the land horizon) is more than 40 years old and has been maintained and even re-built by several different pairs of Osprey. At present it is home to a monogamous pair of breeding Ospreys who use the nest to sleep, breed and raise their young. The nest is an integral part of their life cycle.

This does not solve our problem.

Moving on to West Wallabi Island, we found an abandoned nest. However, this would require so much work to bring it back to a serviceable condition. Besides those tourists and their cameras would be so inconvenient.



Pigeon Island may provide the solution, a friend said, as they had just moved into the area.

Success at last, even though you might not agree.

The local fishermen have come to an arrangement so that we do not build where it is inconvenient for them. They have erected poles with sort of baskets on top. We are free to use these for nesting and to observe our surroundings from.

We are sure our new home is going to be an ideal spot to raise our family.



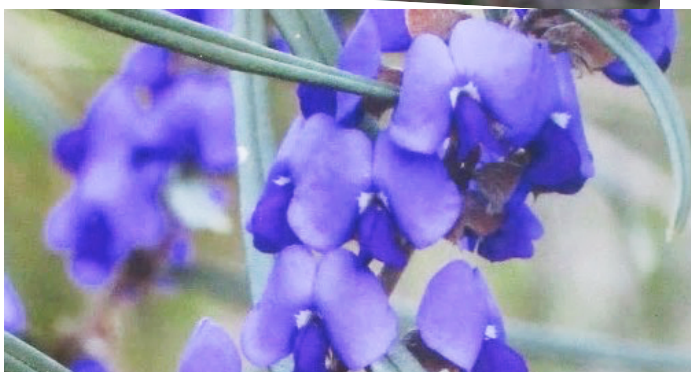
BLUE by Rosalie Breen

Blue is my favourite colour. At the ANN get together in WA, while travelling by bus on excursions looking out the window, we passed clouds of intense blue on the ground among the shrubland and woodland. It made a lasting and delightful impression on me. These clouds were bushes of blue *Lechenaultia biloba*, plentiful and in many different habitats. So different to see so much blue in the bush. In central Australia, we have *Lechenaultia divaricata*, a low straggly wiry looking bush with no leaves and yellow and white flowers. WA's is a prostrate herbaceous plant, the green leaves complementing the blue of the many five petalled flowers. Each of these corolla lobes are divided into two joined lobes. Quite distinctive.



So that started a mission to take note of more blue. The most obvious were the humans many of whom were wearing blue jackets, a badge of Perth ANN and easy to spot. Seriously though, there are many species of *Dampiera* which are blue and also belong to the *Goodeniaceae* family. (CA's Goodenias are almost always yellow).

From the top: Blue *Lechenaultia biloba*: a wander in the Wongamine ; Blue Squill, *Chamaescilla corymbosa*; *Dampiera sp.* and a Common Hovea, *Hovea trisperma*.



NB. The correct spelling of the generic name, *Lechenaultia*, is open to some argument. It was named after Leschenaultia de la Tour, a botanist who visited Australia in 1802-3. However, when Robert Brown, an early botanist first published the name he spelt it *Lechenaultia*, omitting the 's'. The spelling without the 's' is considered valid by Australian taxonomists. However, The 's' is often included in the common name.

Alice Springs has the Orange Spade Flower. WA trying to go one better, has blue *Hybanthus calycinus*, called appropriately Wild Violet. We have a stunning pink *Calytrix*, WA has one that is smothered in blue flowers with five petals and prominent yellow stamens turning red with age, (probably *Calytrix fraseri*). Other new ones were the Hoveas, a number of species of shrubs with clusters of blue or purple pea flowers. Tantalizing and very photogenic was Blue Squill, *Chamaescilla corymbosa*. It is a lily of sorts with a multiple of three petals. Perhaps the prettiest flower was Blue Tinsel Lily, *Calectasia narragara*, blue with a splash of red and yellow anthers. (see photo on front cover) The name comes from Greek *calos* meaning beautiful, and *ectasia*, meaning stretching out, referring to the star-shaped petals. Narragara is a composite Nyoongar (the local aboriginal inhabitants) name for a star, chosen for its common name "Star of Bethlehem". The species *C. cyanea* is rare and endemic to around Albany. Of course many of the hundreds of orchids are blue too. Not quite blue but mauve *Melaleuca radula*, Graceful Honey Myrtle surely can be included too. In Kings Park gardens I met the brilliant blue daisy, *Brachyscombe iberidifolia*, popular for home gardens, called Swan River daisy. So many and varied flowers to see and discover, I was a bit overwhelmed.

Blue colour in nature is not common. Less than 10% of the 280,000 species of flowering plants are blue. The pigments in flowers are mostly carotenoids or flavonoids. Blue colour is shown when the red anthocyanin pigment has been modified by the plant and the reflected light from this gives us blue. Anthocyanins are strong antioxidants and plants high in these are recommended for healthy eating. Blue in flower language was used to convey special or secret messages to someone. The colour stands for desire or love. It symbolized hope and beauty or peace and tranquillity. So my love of blue helps me relax and slow down. Peace to you too!

Photos from the top: Wild Violet, *Hybanthus calycinus*; a blue Fringe Myrtle, *Calytrix* sp.; Graceful Honey Myrtle, *Melaleuca radula*; Blue Lady Orchid, *Thelymitra crinite* and Swan River Daisy, *Brachyscombe iberidifolia*





The Abrolhos Island trip by Deb Clarke and Charlie Carter

(Pre ANN get-together tour)

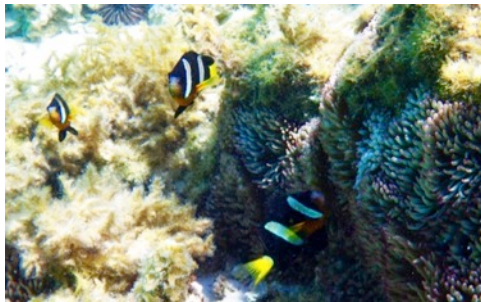
After two and a half weeks on the road via Kintore, Kunawarritji, Marble Bar, Karijini, Ningaloo, Shark Bay and Kalbarri we arrived at Geraldton for our ANN Abrolhos trip. Along the way we experienced the most stunning wildflower display, from Glen Helen to Marble Bar was Ptilotus Land, including *Ptilotus rotundifolia* (left)

At Geraldton, the first thing we found was that most things are shut on Sundays, but the 'waterfront precinct' was abuzz with people, and we spent a few hours in the Shipwreck museum.



The most famous of the wrecks is the Batavia, run aground on a reef in the Abrolhos in 1629 and the museum has lots of relics and information about it.

We boarded our boat late afternoon spent the night on board, and headed off to the islands the next day. Our cabin was top deck, comfortable and en suite. (left) Our skipper and owner, Jay had been a cray fisherman, and knows the islands, the people and the history. The crew were friendly and helpful and the tucker good and plentiful. Jay's laidback style almost concealed his quiet efficiency, and we covered a lot of ground (and sea) over the 4 days.



Uninhabited islands in the Pelsaert group were a trove of birdlife, and we had a bird expert with 40 years of research experience for the first day. Landing on the islands was accomplished in glass-bottom boats so we could enjoy the corals and fish on the way. (left)

Next day the Easter group included Rat and Little Rat islands packed with cray fisherman's shacks. (left) Some of the fisher folk can't stand tourism, but one of Jay's friends gave us a rundown on the life and the industry. Jay is actively trying to get the two groups to cooperate, and to get some crayfish available for visitors at a reasonable price. Currently they all get flown to Asia @ \$90 / kilo.



The cooks made a delicious Pavlova 'birthday cake' for Deb's birthday, and made it a nice party.

Sailing on to the Wallabi group we saw whales and dolphins right beside the boat (bottom photos), and on Beacon the remains of the Batavia survivors occupation and the gruesome history.



On the beaches were Sea Lions, very quiet and up close, and we had a chance to snorkel over the coral and fish. Masses more birds, and Tammar Wallabies, as well as various reptiles also inhabit these islands. The islands are all low-lying, and surrounded by reefs giving a palette of beautiful colours in the water and on the land.

The last night was spent back at the wharf in Geraldton, with breakfast on shore the next morning. We picked up our car, and set off for Freo, with the rest of the group going to the museum and then the bus trip south to the ANN.



From the top: *Ptilotus rotundifolius*; our boat; fish and coral; cray fishermen's huts; activity near Big Rat Island; Dolphin and Whales.



Baby Sea Lion



Batavia plaque



Abrolhos Eremophila



Daisies among the coral



Group walking on the beach



Lesser Noddy on nest



Nesting Cormorants



Pacific Gull nest



Pacific Gull



The sky full of birds



Jocelyn beside a fishermen's marker



Tammar Wallaby



Baby Sea Lion suckling



Storm from Big Rat Island



Incredible colours of the water and land



Other Odd Thoughts about ANN Perth by Rosalie Breen

First I'd like to add my congratulations to the steering committee and their many helpers for a well chosen and organized gathering. Our excursions were to a broad slice of the country, centred around Perth. Much appreciated was the comprehensive booklet, which contained as well as our program plant and bird lists for the different places we visited, with a brief overview of each environment, and an explanation of why the South West is a "biodiversity hotspot". Our cloth bag had a wonderful picture of a numbat designed by Mike Bamford. Thanks to all.

Apart from blue flowers another favourite of mine, were Feather Flowers. Their genus *Verticordia* means "turner of hearts". It is well deserving of its name, providing a stunning display. The bushes were thick with delicate feathery flower petals sure to impress everyone with their glory. Yellows were everywhere in the heath lands of Ellis Brook Valley. There are also crimson and combinations of white and pinks. These after pollination change to red colours. My favourite was the white and burgundy *Verticordia huegelii*, Variegated feather flower (left). Also plantwise, I was amazed at the number and variety of Trigger Plants and the carnivorous plants, *Drosera* species.



Banksias are iconic in WA because there so many different shapes, sizes and colours. Most produce their flowers and cones high in the tree or bush, making it convenient for



pollination by birds (and possums) seeking nectar. But many have their flowers at ground level. Strange? No! These are pollinated by small marsupials, such as bandicoots, and rodents. But a worry is that many of these smaller animals are endangered. Who will take on the pollinator job?



Radio Hill in Fremantle, an easy place to visit and with expansive views, had a great display of many different species of orchids in a self-guided Wildflower Walk, with many signs indicating the names of flowering plants too. The WA floral emblem, the red and green Kangaroo Paw, *Anigozanthos manglessii* was present in its vivid velvet colours. The orange Cats Paw, *Anigozanthos humilis* was numerous too, since it tends to appear after soil disturbance, or fire as in this case.

Every nature reserve we visited seems to have an active Friends group who helped care for the place. These provided our many and enthusiastic, knowledgeable guides. We were so lucky to have local experts so willing to share their love of the bush. Invasive weeds are a major problem for the volunteers. Most noticeable weeds were the Pink Gladiolus and the (I thought) attractive Blowfly Grass. Many were the same as appear here in central Australia.

As we know bird beaks are adapted to the food they need to collect. A major food source for cockatoos and parrots in the Southwest is the Marri tree, a bloodwood, *Corymbia calophylla*. Interestingly, Marri is from the Nyoongar word for blood. This and Jarrah and Karri are the well-known forest trees. The birds chew the big nuts, called honkey nuts, to obtain the seeds, and can be identified by the pattern of chew marks on the nuts, dependent on the shape of the lower jaw of their beak (mandible).

Below: Hirono Kami, our guide for the visit to Lightning Swamp showing a chart of chewed Marri nuts; Nuts chewed by the Forest Red-tailed Black Cockatoo.

