

Wildflower Society of Western Australia Newsletter

Australian Native Plants Society (Australia), W. A. Region



February 2017 Vol. 55 No. 1 Price \$4.00

Published quarterly. Registered by Australia Post. Publication No. 639699-00049



**AUSTRALIAN
WILDFLOWER
SEEDS**

*Enjoy Brilliant
NATIVE PLANTS
IN YOUR OWN
WATER WISE GARDEN*

Ask for our seed packets at garden centres, nurseries,
botanic gardens and souvenir shops or visit our website
to see our range and extensive growing advice.

Many Australian native plants require smoke to germinate
their seeds. Our **Wildflower Seed Starter** granules are
impregnated with smoke. Simple instructions on the packet.
Suitable for all our packaged seed. Safe to handle.

Phone: (08) 9470 6996
wildflowersofaustralia.com.au

WILDFLOWER SOCIETY OF WESTERN AUSTRALIA

The newsletter is published quarterly in February, May, August and November by the Wildflower Society of WA (Inc).

Editor Committee convener and layout:
Bronwen Keighery

Mail: PO Box 519 Floreat 6014

E-mail: bjkeighe@it.net.au

Deadline for the May issue is 5 April 2017.

Articles are the copyright of their authors. In most cases permission to reprint articles in not-for-profit publications can be obtained from the author without charge, on request.

The views and opinions expressed in the articles in this Newsletter are those of the authors and do not necessarily reflect those of the Wildflower Society of WA (Inc.).

Advertisements are welcome, new charges will apply from May 2017. Charges per issue (incl. GST) are as follows, with the new prices in brackets:

	B&W	Colour
Full Page	\$90 (\$100)	\$210 (\$230)
Half Page	\$60 (\$70)	\$150 (\$170)
Quarter Page	\$45 (\$50)	\$120 (\$130)

Members receive a 33% (10%) discount.

This Newsletter is available online to all members.

Contents

From the President	3
Miss Kathleen (Kath) Napier	4
Education	6
Conservation	6
On Eucalypts and two books 7	
Society 2017 AGM Notice of Motions	8
Call Nominations Society Awards 2017	9
A Banksia Study Group?	10
Anne Bellman Volunteer Award	10
Branch Contacts and Meeting Details	12
Armadale Branch	13
Eastern Hills Branch	15
Murdoch Branch	17
Northern Suburbs Branch	18
Perth Branch	19
South West Capes Branch	19
Western Australian Carrot Relatives	20
Book review - Standing on shoulders	28
Woodland (shade) plants	34
Native plants don't need phosphate!	35
Rare Flora Search and Rescue Project	36
Forget-me-not not forgotten any more	37
An Open Garden with a difference.	38
Events	40
Buzz Pollinated Flowers of WA	41

Some Apiaceae Genera

Photos: Bronwen Keighery

Front cover: *Trachymene cyanopetala* in a granite moss sward community at Elachbutting Rock. A wide spread species of the wheabelt.

Inside Front cover: Left the rare *Brachyscias verecundus* near Mt Chudalup (flowers); top right *Homalosciadium homalocarpum* (flowers and fruit) Duncraig; and *Daucus glochidiatus* (fruit). *Daucus* and *Homalosciadium* are widespread in WA.

Back cover: *Playtysace cirrosa* plant and tubers, *Hydrocotyle lemnoides*; middle *Playtysace reflexa* plant and tubers, insert flowers; and below SW buzz pollinated flowers.

Society Management

President	Geoff Corrick	9332 3652
Vice-President/webpage	Nina McLaren	9448 5419
Hon. Gen. Secretary	Kerry Smith	9385 9119
Treasurer	Jenny Garroun	0419 707 755
Committee	Christine Allen	0468 676 933
	Bronwen Keighery	9381 4062
	Kelli McCreery	9371 9491
	Peter Ray	9298 8145
	Kim Sarti	9470 2297
	Sybil Speak	9444 1495
	Mathew Woods	9277 2363
Merchandise & Events	Sybil Speak	9444 1495
Newsletter Convenor	Bronwen Keighery	9310 2936
Website Editor	Nina McLaren	9448 5419
Publications Officer	Marion Blackwell	9383 1141
Office	Julie Willers	(Office) 9383 7979
Facebook	Jana Sturis	0418 951 630

Office: Perry House, 167 Perry Lakes Drive, (PO Box 519) Floreat 6014

Hours: 10.00 am – 2.30 pm Tuesday and Thursday

Phone: (08) 9383 7979 (24-hour) **E-mail:** wildflowers@ozemail.com.au

Honor Venning Library at Perry House is open on the first Saturday of the month (except January) from 1 – 3 pm

Website: <http://www.wildflowersocietywa.org.au/>

Membership subscriptions as from 28 September 2016

Category	Newsletter	
	web only	paper
Individual	\$55	\$70
Family	\$100	\$115
Overseas	\$55	\$70
Concession*	\$35	\$50
Junior	\$10	\$25
Affiliated Group	\$55	\$70

* Fulltime students, and those in receipt of a means-tested Australian Commonwealth Government pension.

To receive Australian Plants add \$15 to your fee. Australian Plants can only be sent as a paper copy.

Membership subscriptions now fall due on the anniversary of your membership.

Those members wishing to renew by Visa, Mastercard, save yourself postage by using our email membership form on the Society website OR Direct payment to WSWA Bankwest BSB 306-058 a/c 4197355

WITH a reference with deposit: YOUR NAME + TYPE OF PAYMENT (in this case: m'ship).

Please advise the WSWA Office separately if you have changed your details (e.g. address).

From the President

Plants, partnerships and people are the themes for this quarter's presidential musings.

Orange colours always provide a striking contrast to the generally grey-green background of our native forests and heathlands. At this time of the year the aptly named Christmas Tree (*Nuytsia floribunda*) is a good example. The ones seen around the southern suburbs of Perth tend to be quite orange to my eyes. It is an interesting plant because of its semi-parasitic nature. Its aggressive system for attaching its roots to neighbouring hosts is a good example of the partnerships that are an essential part of the natural world.

Further on the topic of nature's partnerships, I have included a lucky picture (photo page 21) of a native bee flying in to feed on a flowering *Xanthorrhoea*, and probably to effect pollination. This was taken in Meelup Regional Park just west of the last houses in Old Dunsborough in mid-November. The walk through the coastal heath here is highly recommended. Lots still to see in flower in November, and places for a swim along the way, if you pick a hot day.

More is being added every day to knowledge about the partnerships that make the natural world function. Animals and insects provide pollination services in return for food. Fungi and bacteria provide nutrients for plants and for animals too in their digestive systems. Amongst human beings it is unfortunate that many people seem to not yet understand that we depend on natural systems for our clean air, fresh water and productive soils. Our partnerships with the natural world need to be effective for our survival.

Partnerships between people, the circles they move in and the organisations they belong to are important too. Avon Branch in their notes in last year's May Newsletter highlighted a long list of organisations with which partnerships are being fostered. Other Branches and ourselves as individuals could probably write similar lists, with Friends groups, educational institutions and local government as examples of partners.

From the initiative of our Society's Conservation Subcommittee we are part of what is now called Partnership for the Outback (formerly Outback Alliance - mentioned in recent newsletters). We still have hopes that changes to the Land Administration Act to allow other uses for some of the leasehold land in the State's rangelands will happen after the State election.

Our Society has also given its support to the campaign "Create Ranger Parks", in partnership with many other groups interested in caring for our country by retaining people on the land. Look it up on the internet. There is a petition to sign if you would like to lend your personal support

Our Society, through a partnership with Kwongan Kids, is also planning to refresh our education activities amongst primary school-aged children in particular.

Where aims coincide partnerships can be great for giving encouragement to the participants of each group, and gives both parties confidence that they are not facing conservation challenges alone. As we pause and ponder what the New Year might bring I encourage you all to nurture partnerships, big and small, particularly those that allow our natural world to blossom.

Geoff Corrick



Miss Kathleen (Kath) Napier

9th March 1919 to 11th February 2016

Long-time member of the WA Wildflower Society, Kathleen Dorothy Napier, passed away on 11th February aged nearly 97. Kath became a member of the Society in July 1972 and was a regular attendee at meetings and on excursions. She was elected to the Regional Committee in 1988 and became Newsletter Editor from 1989 to 1994.

Kath was a quiet achiever who excelled academically and gave much of her experience and wisdom to her vocation as an educator as well as supporting a large range of societies and organisations. Quite a private person, she actively participated in academic and volunteer activities, the members of which were invariably unaware of her deep involvement in other groups. Academically, a trained teacher, Kath specialised in adult literacy.

In 1999 she received national accolades for her seminal role in forming the Volunteer Tutor Project in 1977; the project was to later become the “Read Write Now Program”. In 2003, after fifty years of endeavour, Kath was awarded the federal Minister of Education’s award for her “outstanding contribution to improving literacy and numeracy”. Up to that time it was estimated that an astounding 25,000 adults had benefitted by one-to-one tuition from Kath, sometimes in her private home. She also strongly supported around 1,500 adult literacy tutors. In the late 1970’s and early 80’s Kath reached many more students by arranging and presenting a live, weekly radio program for the print handicapped. Selected friends were fortunate enough to be asked by Kath to help with her Saturday weekly program on 6NR, the WA Institute of Technology (WAIT) public access radio station that began broadcasting in 1976. Kath even mastered the operation of the studio control console.

Apart from her contribution to the Wildflower Society, Kath was one of a number of very productive volunteers at the WA Herbarium. Her leadership skills and ability to master new tasks and new technology, resulted in her becoming manager of the Digital Image capture team, formed from staff and volunteers in 1995 for selecting and editing the first suite of plant images that supplement FloraBase. Her love of wildflowers and garden history commenced early in life, and led to active membership of the Guildford Society, and Heritage Roses of Australia.

Kath was born in Mount Lawley in March 1919. Her mother Dorothea had achieved academic accolades in her early school years at Collie and Subiaco, passing the University of Adelaide “Junior” examinations in seven subjects, including English, Maths, and Botany. Dorothea, whose parents bought “Carinyah” in Helena Street Guildford in

1909, sat for and passed music exams, and gained entry to Perth Modern School around 1911. Kath's father John Howard Hastings Napier, the son of New Zealand parents from Dunedin, was an Engineer who served in the First World War, and was wounded and lost his left leg at Gallipoli. John and Dorothea married in Guildford on Anzac Day 1918, and moved to 29 Second Avenue Mount Lawley where they remained for many years.

At an early primary school age Kath exhibited high level writing skills. She wrote many highly descriptive letters to the Perth Daily News "Auntie Nell" columns, and later to the Sunday Times children's pages. The published letters indicate that Kath had a loving, close family, who particularly enjoyed outdoor activities together. Her letters described her family outings to events like the 1927 welcome to Perth for the Duke and Duchess of York, beach walks at Cottesloe, picnics at Crawley Bay, cinema visits, and visits to see the wildflowers in the Perth Hills. She won accolades and prizes for submitting the best letter to the newspapers, and she also entered poems and won a number of quizzes and riddles.

Kath was an intelligent, widely read person who excelled in her studies not only at primary school in Mount Lawley but also later at University of WA. Following her mother by studying pianoforte, and in gaining entry to Perth Modern School, she matriculated in English, French, German and maths subjects in 1936. Then Kath was able to move on to the University of WA where she studied European languages as part of her Bachelor of Arts degree, followed by teacher training. After teaching in WA, Kath moved to Sydney and then to London where she lived for a number of years as an educator. She purchased a residence, 16 Cheyne Court, Flood St, Chelsea SE3 in London, and made many friends in the UK, sometimes by letting out accommodation to Australians and New Zealanders working in London.

Returning to WA from London at the end of 1964, on the death of her mother, Kath returned to the UK for a few more years, coming home to live in Perth once again in the 70's when her father became infirm; she lived with him at the Avenue in Nedlands until he passed away in 1987. That year she moved to a self-contained unit, part of her mother's family home at 35 Helena Street Guildford. When the owner, her maternal Uncle Max West died in 1975 he left Kath half of the house and eventually Kath bought the rest of the large house and lived there until she moved to a smaller apartment in Guildford in 2009. Before her death she moved to Mandurah to be close to her much-loved sister in law Vera. Kath passed away peacefully on the 11th of February 2016 after a long and very productive life. She didn't really receive the recognition for her contribution to society that she should have.

Neville and Denise Marchant

From the Newsletter Committee

From feedback the changes in fonts were well received and people are happy with the text over the whole page and did not feel their was a need for two columns with the size of the Newsletter.

Layout for this issue: Bronwen Keighery. **Proof reading:** Jim Barrow, Alex George, Jolanda Keeble, Marta Rossignoli.

Education

The Educational subcommittee held its inaugural meeting on Wednesday on the 11th of January at the Cockburn Wetlands Centre. Our basic aim is to get kids and young people into the bush: to get them interested, knowledgeable and active in the conservation of our amazing wildflower heritage.

After much excited discussion, we have decided to start by holding a trial Expo at the end of April for members and their guests. The purpose of this is to showcase our ideas and proposed activities and to gain feedback from the participants. We would very much appreciate your support and encourage you to attend with your young people. There will be more information on the format of the Expo later.

If you are interested in the Expo or would like to join our subcommittee please contact Jennifer Dudley on jendu@iinet.net.au.

Amanda Spooner

Conservation

The last three months have been extremely busy with both the preparation of submissions on projects before the Environmental Protection Authority (EPA) and also appealing EPA Reports. A detailed submission was sent to the EPA on a Mineral Resources' plan to mine the Helena and Aurora Range. This substantive submission benefitted from the many people who provided additional information on the proposal. We have been advised there were more than 1400 submissions and possibly 200 of these being very detailed. It is amazing that several people in the mining industry put in submissions opposing the project. This is not so surprising if you have visited the range and experienced its natural wonders. Hence there is a great deal of opposition to the destruction of this special area. The final assessment report from the EPA is expected by early April.

Our opposition to the granting of mining tenements in the Helena and Aurora Range Conservation Park continues and the Environmental Defenders Office (EDO) is assisting the Society, Helena and Aurora Advocates and the Wilderness Society in appearing in the Mining Wardens Court.

As mentioned several appeals were made on projects, in the Great Victoria Desert (mineral sand mining), Goldfields (uranium mining), Rangelands (iron ore), Yilgarn (iron ore) and the Wheatbelt (road widening). We were only successful in getting a couple of very small concessions to do with weed management. The Office of the Appeals Convenor reporting to the Minister for Environment likes to state it administers a merits based process. Our experience is the exact opposite as even when critically endangered woodlands or critically endangered flora is involved, as well as special landforms the mining industry and Main Roads are given free rein to implement their proposals to the detriment of the environment. I would suggest people have to seriously think about this with an election coming up.

The EPA had a meeting with environmental groups in mid-November and concern was expressed to the EPA on the following matters: Clearing and approvals under the Environmental Protection Act, outcomes likely from the Perth-Peel Strategic Assessment,

the Offset Process and implementation, One -Stop-Shop Approvals, Deferral to other regulators, Water Availability and Environmental Flows, and Assessment of Greenhouse Gas Emissions at a State level. There is not space to go into details but I would be happy to answer any questions on this or any other matters. The Chairman of the EPA has said he would seriously look at the concerns raised.

You may have noted the EPA has a new website from December 13th 2016 and it is easier to navigate and to access Guidelines and Procedures.

Brian Moyle, Chair

On Eucalypts and two books by Dean Nicolle

Smaller Eucalypts & Taller Eucalypts for Planting in Australia

Eucalyptus is an important genus of the world's plants. It is significant that Australia is the only continent in the world whose vegetation is dominated by a single genus of plants, namely *Eucalyptus*. In addition, this particular genus is almost unique to our continent (with just a few species occurring on islands to its north, including New Guinea). Some species grow almost to the tops of our tallest snow-capped mountains, others down to the surrounding seas, and others again, from the edges of rain forest to the depths of our deserts. They are THE outstanding living feature in most natural Australian landscapes and the key element that impart identity to an Australian scene.

Yet the majority of us don't know the names (i.e. the botanical identity) of more than a few. The prime reason being that *Eucalyptus* is a large, diverse and complex genus, with widely scattered species, some growing in as yet seldom visited locations and undoubtedly with a number as yet to be discovered. It has been difficult for botanists to comprehend the whole assembly; and quite a number of species have until recently not had their botanical names determined. Into the bargain, even when named, it hasn't been easy for an average person to work out what name applies to 'their particular plant of interest'. And it is a fact that when an object doesn't have an identity, it is almost impossible to advance your interest and knowledge pertaining to it, apart from what you observe at the time. Even if you are initially strongly motivated, and desperately wanting to further your quest, there is sadly no meaningful mechanism for storing/recalling information so that it relates to an unnamed object, i.e. until it has a name, there is nothing to attach information to. This situation has been an impediment from the beginning of the landscape development of our settlements in this continent. It is a pivotal factor that has detracted from the use, as well as the recognition, acknowledgement and understanding of the value and importance of this unique and inestimable natural asset, 'our Gum Trees'.

It is thus not surprising, that as a consequence, up until now, eucalypts have sat in both the amateur's and the professional botanist's 'too hard basket', with only the occasional 'tackling by taxonomists of a few species,' or 'of a segment of this genus'. We have thus had to wait for a very long time for this large group of our Australian plants to be recently taxonomically unravelled as a whole, and for many of the individual species to be named. Eucalypts (our widespread, 'national tree') have suffered a great disadvantage as the result of this situation. To a large degree they have been neglected, underestimated

and often even ignored; as without a name, it is impossible to assemble, transmit or retain pertinent retrievable information related to a particular species or even to individual trees.

Dean Nicolle has now completely changed this situation for us. It is a joy and a revelation, to at last have to hand, such a lucid and pertinent pair of books on the “Gum Trees” that we grow and also on others that we would want to grow now that we have more information about them, and can find out what their names are. Due to his diligent research, and now with the publication of this beautifully illustrated pair of companion volumes, he has provided us all with a readily accessible means of identifying the gum trees we grow. A facility that we, as members of the Australian public, have needed and been seeking, ever since we first began to take notice of the trees that are growing around us. With the assistance of these manuals we will now, at long last, be enabled to determine their correct botanical names, and to record and consult data about them.

His information for each species is written in simple English, lucid and to the point. The plant’s botanical name is followed by its common name, (if it has one). Then the origin of these names and what they mean or refer to. Next comes a clear, concise description, covering pertinent points and distinctive features. Then successively: INatural distribution & habitat; Cultivation & uses; and Management, followed by notes on Similar species (these are most helpful in making a diagnosis). This text is accompanied by clear, informative photographs that illustrate the pertinent features that immediately help to identify the plant of interest; a chart of the plant’s (cultivation) Preferences and a map of its natural distribution.

The major additional benefit from this publication is the fact that once a plant has a botanical name, information about that plant such as special attributes, capabilities and potential under a variety of conditions, will accumulate. This species information will be of help in future choices made for planting in specific situations.

This is a treatise that was well worth waiting for and will prove to be the tool to familiarise us all with a most interesting selection of our nationally dominant genus of plants.

So, all you Wildflower People, the field is now open to find out what you’d like to grow that fits your particular situation. Go to it. Dean Nicolle has opened the door for us to embrace and begin to understand what is probably our most significant living National Asset.

Marion Blackwell, convener of the Society Publications Committee

Society 2017 Annual General Meeting Notice of Motions to be Presented

The Notice Convening the 2017 Annual General Meeting (AGM) will be included in the May 2017 edition of the Society’s Newsletter. Please note that any motions to be dealt with at the AGM need to be included with the Notice Convening the AGM and should, therefore, be forwarded to the Honorary General Secretary, Wildflower Society of WA (Inc.), PO Box 519, Floreat 6014 or wildflowers@ozemail.com.au to arrive no later than March 23, 2017.

Kerry Smith, Honorary General Secretary

Call for Nominations for Society Awards 2017

There are three categories of Awards presented at the Society's AGM, which will be held on Saturday on the 24th of June 2017 and hosted by the Merredin Branch in Merredin, WA. The closing date for nominations is Tuesday on the 2nd of May 2017. Please mark your nominations CONFIDENTIAL and forward them to the Honorary General Secretary, Wildflower Society of WA (Inc.), PO Box 519, Floreat, WA 6014. Members should consider resubmitting a previous nomination if it was unsuccessful.

Wildflower Society Award

The criterion for this award is that the person or group should have advanced the aims of the Society. The recipient does not necessarily have to be a member of the Society but most are. Nominations should be no more than two pages long. A nomination may be made by an individual or by a Branch Committee. A subcommittee of the Management Committee is established specifically for this award after the deadline for nominations. None of this subcommittee's members can be nominators or potential recipients.

Honorary Life Membership

This award is not restricted to one member per year nor is it necessarily made annually. A member nominated for this award should have rendered special or meritorious service to the Society and must be nominated by a member of the Society. The nomination is approved by the Management Committee. Honorary Life Members do not pay the annual fee but are entitled to the benefits and privileges of an Individual Member. Nominations should not be more than one page in length.

Meritorious Award

Nominations for this award are made by Branches and are for services to the Society at a Branch level. The nomination is approved by the Management Committee. There is no restriction on the number of Meritorious Awards given each year, and Branches may nominate more than one member.

Kerry Smith, Honorary General Secretary

Eastern Hills Branch members of 30 years or more were presented with a glass goblet.



A Banksia Study Group?

Former Banksia Study Group and prospective members, you are invited to consider membership of our group which is being reactivated after being in recess since 2013.

Many interesting developments have afforded copious material for many interesting newsletters. These include: grafting; new species with DNA taxonomy; many new colour and dwarfing forms of a number of species; PHD projects utilising *Banksia*; and new gardens/collections. Your input is encouraged with pictures, successes and failures to add to the wonderful databank of material already recorded.

Sincere thanks go to past leader, Dr Cas Liber for his invaluable contribution, informative newsletters and great plant profiles.

To join the ANPSA (Australian Native Plants Society, Australia) Banksia Study Group simply visit <http://anpsa.org.au>.

Anne Bellman receives a WA Volunteer Service Award

Over the last 30 years Anne has been an active, competent and enthusiastic participant in over 50 systematic site-based surveys of bushland in conservation reserves, proposed reserves, Crown land and other conservation land. This has been with the Wildflower Society of WA Bushland Survey project where all participants are registered as Department of Parks and Wildlife Volunteers. Following the field surveys she has processed, identified and selected specimens to be lodged in the Western Australian Herbarium. She has been integral in the establishment of Regional Herbaria at Jurien, Geraldton, Rockingham and several centres in the Wheatbelt.

For the last 10 years she has coordinated and trained other volunteers in the Survey Project both in the field and at the Reference Herbarium. As a regular volunteer at the WA Herbarium she has been mounting flora specimens (initially with sticky tape and now with dental floss) for over 25 years (mounting 830 in the last 6 years).

Anne is also active locally and spends a day a week with the Friends of Pagononi Swamp and has previously worked at the Children's Forest in Baldvis and at the Naragebup Environment Centre (location of the Rockingham Reference Herbarium).

Anne has a delightful nature, sound common sense and a good sense of humour. She has consistently attended surveys and the Wednesday herbarium session. Her diligence, flexibility and reliability have contributed to the professional nature of the Survey Project. She warmly welcomes and trains new members. Her devotion to the conservation and promotion of the unique WA flora is an inspiration to many.

Modified from the Award Nomination





Above: Anne and Allan Bellman out on a plant survey in Salmon Gum country. Anne is working on the quadrat data sheets, filing in the information on each individual species collected. Each specimen receives a number. Allan is writing a label for each specimen. Each label has the species number (as allocated by Anne), date and quadrat name.

Photo Jeff Langley.

Left: Anne Bellman measuring the girth of a Salmon Gum near Widgiemooltha.

Photo Judith Harvey

Branch Contacts and Meeting Details

Albany Albany Regional Herbarium

3rd Tuesday 7.30 pm (Entry of corner Moore and Hymus Streets)

President: Lynda Strahan 0438 127 534

Secretary: Wendy Minchin 9845 1220 (albanyherb@dpaw.wa.gov.au)

PO Box 937, Albany, WA 6331

Armadale Field Study Centre Armadale Settlers' Common Triton Rd

2nd Thursday 7.15pm for 7.30pm,

President: Sue Radford 0438 134 278 (suepr22@yahoo.com)

Secretary: Steve Aldersea 9399 3649 (stevealdersea@hotmail.com)

PO Box 859, Armadale WA 6992

Avon

President: Eric Ayling (ayfo@wn.com.au)

Secretary: Cheryl Warburton (ethel@westnet.com.au)

PO Box 60, York WA 6302

Darling Range Old Guide Hall (Paxwold), 5 Sanderson Rd, Lesmurdie

President: Lynda Tomlinson 9291 8753 (lktom555@gmail.com)

Secretary: Rosemary Johnston (rmjohnston3@bigpond.com)

Eastern Hills Octagonal Hall, 52 McGlew Rd, Glen Forrest

4th Friday 7.30pm for 8pm

President: Lee Roberts (lee.roberts205@gmail.com)

Secretary: Sandy Stone (sandyroger.stone@gmail.com)

Kulin Herbarium, Resource Centre, Johnston St, Kulin

1st Tuesday 12 noon

President: Sandra Murray 9880 1268 (dragonfire7177@gmail.com)

Secretary: Sandra Murray

PO Box 56, Kulin WA 6365

Merredin

Vice-president: Mal Harper 9041 1421 (mhharper@comswest.net.au)

Secretary/Treasurer: Tracy Scott

PO Box 95 Nungarin WA 6490

Murdoch Branch Cockburn Wetlands Education Centre, Hope Rd, Bibra Lake 6163

1st Thursday 7.30pm for 7.45pm

President: Christine Allen (christineallen85@gmail.com)

Secretary: vacant

Northern Suburbs Henderson Centre, Groat St, North Beach

4th Tuesday 7.30pm

President: Richard Curry 9447 2983 (randccurry@gmail.com)

Secretary: Christine Curry 9447 2983 (randccurry@gmail.com)

PO Box 25, Greenwood WA 6024

Perth Subiaco Community Centre, Bagot Rd, Subiaco (just east of Rokeby Rd)

2nd Tuesday 7.30pm for 8pm

President: Greg Keighery 93814062

Secretary: Nina McLaren 9448 5419 (wildflowers.perth@ozemail.com.au)

PO Box 34, Melville WA 6956

South West Capes President: Margaret Moir e-mail: moir@internode.on.net

Secretary: Richard Clark e-mail: rmc@swisp.net.au

Armadale Branch

Soon after our very successful Nature's Beauty Revealed as part of the 'Spring Into Armadale' Festival, we were called on to help with the Spring Fair of the local church in Roleystone. Many of our long-term members have been or are regular attendees, including our beautiful Helen Start, whose funeral we had so recently attended. We put together some large colourful displays and made some lovely friends, including a very talented photographer who is keen to help with the illustrations for our proposed flora pamphlets.

Mid-October we were in full swing for our display at the Kelmscott Agricultural Show, just 3 years younger than the Perth Royal Show. A lovely event where we have been welcomed in the show's flower pavilion and have helped with large displays for the main hall as well. Happily, Zin Zin from the church came to help me with the large arrangements this year.

This year saw the inaugural Rob Harington Award for a floral arrangement, fittingly won by an entry from Australian Native Nursery (photo page 21). Rob did much to encourage the Nursery in its early stages. With a much greater participation in the usual Australian Native flower categories, we were a bright and bold presence in the Flower Pavilion. People were amazed by the large numbers of named specimens that we put out, just from our local gardens.

Our four prizes for art of WA flowers, from Early Primary to Adult ages, had several entries except for the year 10 to 12 category. We will think of a better way to appeal to them, with more publicity this year. The adult section had a better participation rate and the entries were of good quality. Even the *Leucospermum* flower was good, if invalid! The judges chose an impressionist painting that appeared to reflect the colours in our hills woodlands, if you closed your eyes a little. Some members asked if you could really call them WA flowers, but we are open to all forms of expression so will continue the prize. We had much interest and I feel we are reaching out to the greater public in our area.

Due to the wonderful long spring, we popped in many extra walks, delighting in all the wonders of our area that we live in. We started a plan to look at the hills' reserves more, as we feel that we have much less knowledge of the hills' flora. Our talks on geology this year were helping with the underlying geodiversity which our hills flora reflects. There can be huge differences in just a few hundred metres and the flora can be so different from ridge-top to ridge-top. We are delighted to have a young and enthusiastic new member from Churchman's Brook Estate, so together with long term resident and past President, Helen Wildsmith, some more exploring of that area is on offer.

Our participation on the committees of the Bushcare and Environmental Working

Group, Bungendore Park and Armadale Settlers' Common is ongoing and our contribution to seed collecting continues, this year with more focus on previously untried species. We have been inspired by the Lechenaultias (and revegetation in Fletcher Park) so these blue beauties are top of our hit list. The range of colours, with and without a white central star is amazing. Other members are key members of Friends of Forrestdale, Brixton Street Wetlands, Anstey-Keane Damplands and many other reserves in the Shire.



Our last main event was the Great Nuytsia Hunt (photo above) and due to the cool season, many were only just starting to flower. This year we focused on reserves, some yielding counts of over 300, some with none. Everyone seemed to enjoy it and we had a great Branch lunch after at the Elizabethan Pub.

Our garden at Settlers' Common continues to develop, with some losses, but pleasing all the same. We are delighted that the City of Armadale has agreed to make the Field Study Centre at Settlers' Common a dedicated Environmental Centre for all the local groups to use. We have been given smart cabinets for our Branch library which we can now use more effectively and make available to the other groups.

It was great to have the Society Management Committee meeting in October at the Field Study Centre and we had a very pleasant meal afterwards at a local restaurant. I feel a great deal more in touch with the Society as a whole, not just our patch.

It was also a delight to be part of the initiation of the South West Capes Branch and we have made a contribution to their ongoing wellbeing. More branches to play with! We love our good relationship with Murdoch Branch and our developing knowledge of Albany Branch, Eastern Hills Branch and Northern Suburbs Branch with their wonderful propagation team. We continue to work closely with Australian Native Nursery to help us grow our local provenance flora.

I love the resurrection of the 'Open Garden Scheme' and we will continue this year. I feel a great satisfaction that more and more the landscaping is with local native plants, including the new Business Parks. There is business in the bush and can be bush

in business. This will help the continuity of habitat/food supply as the area continues to develop really quickly. The City of Armadale is starting a plan to give free local plants to residents, so we will see how that goes.

With the Biodiversity Bill, the Perth Peel Green Growth Plan, the Federal election and our new local Federal seat of Burt, there have been many extra meetings and letters to local politicians. We have good support from our new MP in Burt, Matt Keogh and hope to develop this relationship more in future. My aim has been to attend many different group meetings in the area and cross-reference with groups like Outdoors Australia, mental health groups, the local artists and I continue my contacts with the local business community. I hope to show that we are intelligent, good, normal people who care about the rest of creation and are prepared to work hard and long to care for the environment. We are not 'alternative, greeny, tree-hugging losers without a grip on reality', a sad interpretation and misrepresentation, but a key, mainstream part of the community. The 56 years that the Branch has been operating in the area as of this year, have been instrumental in conserving the beautiful surrounds that Armadale prides itself on and we are very proud of what has been achieved. We are working on developing more tourist potential for the area and a great deal more awareness of the wonderful, unique flora that we have.

As we get organised for hosting State Conference in 2018, and our 60th Birthday in 2021, we have made progress on our local flora booklets and on updating the Branch History.

I will step down as President at our AGM in March and I know that the Branch will continue to roll on full bore, as everyone just gets on and does their bit brilliantly well. I should like to thank everyone in the Branch for all the fun we have had together in the past year.

Wishing you all a terrific and floriferous 2017. **Sue Radford, President.**

Eastern Hills Branch

Last year (2016) was our 40th Anniversary of becoming a branch of the Society. To observe and celebrate this important occasion two special events were organised. The first was a special address, delivered in April by Professor Kingsley Dixon – formerly, for over 30 years, the Director of Science at Kings Park and Botanic Gardens, now part of the Curtin University academia. The address was of the wonderful and oft times curious diversity of our flora and why this is so. The Shire of Mundaring gave us permission to use their facilities for this well-attended event, which was much appreciated. The second occasion was a tasty luncheon, thoroughly organised by our multi-skilled treasurer, Robert Atkins. The happy and momentous occasion, which several people from the central committee and other branches attended, was sponsored and funded through a Mundaring Shire grant, with some of their councillors and staff joining in the celebrations. Peter Day, a member at the inaugural meeting 40 years ago, gave an interesting overview of our history which included brief overviews of people who had contributed much to our branch over the years. A special presentation of certificates and engraved glass goblets were made to members who had attained their 30 years membership (photo, page 9).

Our annual Plant Sale, held on the Saturday before Mothers' Day, was once again a very successful event, with the Northern Suburbs nursery members 'making the trek up

into the hills to give valuable and much appreciated knowledge of their plants and sales assistance. A new layout was trialled and seemed to work successfully with the huge crowd that arrived to be informed and buy, despite the rainy conditions that persisted for much of the day. To ensure a smooth running of the this annual event, Lee Roberts is implementing a ‘ buddies system’, so that the methods and information surrounding this event are passed on from a key person of each activity needed to ensure the smooth running of this event. Plant sales have extended into the Mundaring Rotary Markets where our growers and members are promoting in part the philosophy of the Society – Enjoy-Know-Grow-Conserve.

Another activity that brings the diversity and beauty of our wildflowers to the fore was that of opening members’ native plants gardens for the interest of other members and possibly the general public. In response to an idea from Society members who attended the ANPS(A) Canberra Conference, Janet and Robert Atkins held an open garden afternoon at their home in Mundaring (see Newsletter 54 (4): 20–21, Nov. 2016). This is vastly different to that of Eddy and Donna Wajon’s lovely garden, being a hills and mainly a shade-loving plants situation. More diversity and interest. It was also very well attended, despite the inclement weather (our wettest winter for many years) with keen Armadale members being personally shown around the extensive gardens, complete with bird boxes and the family chooks, by Janet. The afternoon teas were delicious and viewing the plants, many of which were tucked in beneath higher growing shrubs, provided one with many surprises as one wandered the several paths within their garden.

An enthusiastic group (including a family group with toddler and a couple of keen Russian lady photographers), set off over the long weekend in September, to explore and enjoy the diversity of flora and geography that is the Tutanning Nature Reserve, located near Pingelly. The Marshall brothers, who are keen to promote the spectacular show of flora that presents itself each year in the reserve, guided our group. Judith Harvey, with Newdegate colleague Anne Rick also helped guide the group. The input of these folk added immensely to the keenness and appreciation of the reserve by our members and was the ‘icing’ on a varied floristic cake. Our outing, capably organised by Christina Lyall, (with extra advice from Fran Kininmonth who had visited the reserve in 2015), made such an impact on the local community that the event made headlines and lead article of the Pingelly Times. We would encourage each branch to put this into their list of ‘Must Visit’ places, it’s really as beautiful and diverse as described.

We have had our AGM and welcomed a new member, Pam Rutherford, to our energetic committee.

Guest speakers for the coming year continue to be arranged and welcomed by attentive groups of members each month. Our other group activities – propagation and seed cleaning continue, with new participants very welcome to join in. Our photography group has gone into recess with the retirement of Andre Lebel, who has given several years of providing appropriate and diverse information of things Photographic to group. Another co-ordinator is sort so we can continue this activity. Andy’s contribution added a well-received dimension to our branch’s activities and we sincerely thank him for his endeavours.

Best wishes for a fun year to Enjoy Know Grow and Conserve our delightful native plants.

Rob Atkins

Murdoch Branch

The lead-up to Christmas and into the New Year has been a busy and quite stressful time for many members (and non-members) from the Murdoch Branch closely involved in the Roe 8 campaign. Even after recent two court hearings, the clearing continues, but it is heartening to see the thousands of community members who have been visiting the site in an attempt stop the devastation. I encourage all Society members to spread the word about the Roe 8 campaign and call their local politicians to put a stop to this madness!

Our December AGM saw a significant change in the Murdoch Branch Committee, with Pawel Waryszak leaving the Presidency position as his partner and Murdoch committee member Dr. Christina Birnbaum received a post-doc position in New Orleans, so both will be leaving Perth in February. Both Pawel and Christina have been vibrant and very dedicated members and will be missed! As a result, I have taken up the President role and the Secretary role is still vacant. Please let us know if you are interested in this role.

The Murdoch Committee also completed a survey of its regular members to help guide activities and talks for 2017. We got some great feedback and are happy to share this survey with other Branches. We are excited about our first few speakers of the year, on the 2nd of February local artist Vanessa Liebenberg with “Art, textiles and WA flora” and then on the 2nd of March UWA PhD student Dawn Dickinson will be discussing “Urban Green Spaces.” Sign up to our monthly newsletter Marri Leaf here: <http://eepurl.com/b3qNoH>.

We are also planning a social media workshop for all Branches, particularly Committee members, to come along and get help with using Facebook effectively to promote and communicate Branch events. Murdoch Branch has been transformed with the use of social media, with new people attending our meetings nearly every month! Watch this space for more details.

Christine Allen

Newsletter Committee: As you have just read Pawel and Christina are leaving WA for New Orleans, Louisiana. They have both ‘bonded so well with Oz’ (Pawel’s words) that we cannot let them leave without some words. Pawel has made significant submissions to the Newsletter. Here is a brief background to each from Murdoch’s website and other net sources to mark their hopefully temporary departure. We wish them well and thank them for their work in the Society.

Pawel Waryszak and Christina Birnbaum



Pawel loves exploring the natural world. He has always enjoyed learning about the plants that grow around him – by the time he was a teenager, he had already spent a big chunk of his pocket money on flora guides of the Lublin region of Poland where he was born. Pawel did an Environmental Science Masters degree at the School of Environmental Science at the University of Life Sciences in Lublin, Poland. He was involved in a project looking at the recreation impact assessment on the local water reservoir - The Zemborzycki Reservoir. The Zemborzycki Reservoir

is located in central-eastern Poland, within the administrative boundaries of Lublin city. This is a dam reservoir, built on the Bystrzyca River. His European origins allow Pawel to communicate in 5 languages: English (full professional proficiency); Polish (native or bilingual proficiency); Estonian (limited working proficiency); Russian (limited working proficiency); and German (limited working proficiency).

In 2012 he came to Perth where he commenced his PhD project at Murdoch University. Pawel's PhD project looks at the role of the topsoil seed bank transfer in Banksia woodland restoration. He has now completed his dissertation (see photo with thesis, above). Pawel is very grateful to Dr Phil Ladd for introducing him to the folks at the Society who share his passion for wildflowers.



Christina is a plant ecologist interested in a wide range of topics related to plants, including their biology and interactions with below-ground micro-organisms in native and novel environments. Christina hales from Estonia and did a BSc and MSc in environmental sciences, Estonian University of Life Sciences from 2002 -2005; and in 2006 was an ERASMUS exchange student, Lublin Agricultural University, Poland. Her European origins allow Christina to communicate in 5 languages: English (full professional proficiency); Estonian (native or bilingual proficiency); Russian (native or bilingual proficiency); German (elementary proficiency); and Polish (elementary proficiency).

Christina came to Australia for a PhD project from 2008 - 2013 at Macquarie University, New South Wales. From 2014 to the present she has been a Postdoctoral Research Fellow, Murdoch University. In 2017 she begins a further postdoctoral project in New Orleans, USA.

Northern Suburbs Branch

Northern Suburbs rounded off the year with our Annual General Meeting (AGM) and no changes to our committee executive. Brian Moyle was the AGM guest speaker and he gave a very interesting talk on Flora of the Gibson Desert, based on his travels in that region. The talk began with a short history of the Gibson Desert area, from early exploration, including the loss of Alfred Gibson during the ill-fated 1873-74 Ernest Giles expedition, through to the construction work of Len Beadell and his team in the 1950s and '60s, when such famous names as the Gunbarrel Highway were pushed through for the Woomera Rocket Range project. Brian also gave a comprehensive look at the geology and flora of the region, illustrating the ten major vegetation types and myriad species of flora in what is a well-vegetated desert region.

At our October meeting, Jolanda Keeble gave an equally interesting presentation on her flora survey work at Hi Vallee Farm, Don and Joy Williams' property in the greater Lesueur area of the northern wheatbelt. Over the past couple of years, Jolanda has undertaken an extensive flora survey on Hi Vallee Farm and she has published a very colourful and comprehensive field guide based on her survey work. This was a very

popular purchase among the audience on the night! Jolanda gave us a range of statistics on the flora of the farm, then spoke a bit about some of the Declared Rare Flora found there, accompanied by many beautiful photos. There are five main environmental areas on Hi Vallee Farm, ranging from the high valley at 258m, lateritic outcrops, the laterite mesa known as Mike's Hill, areas of deep sand and a creekline. All have different vegetation and we were fascinated by the range and variety of flora.

2017 promises to be another busy and exciting year for the branch. The annual plant sales at our nursery at Landsdale Farm School are scheduled for Saturday 22 April and Saturday 4 November and there will be a range of other "off-campus" sale days as well. And, of course, the nursery is open every Thursday and Saturday until 3pm, so come along and pick up a few West Australian plants for your garden.

Christine Curry

Perth Branch

In October three members (Alex George, Mary Gray and Brian Moyle) led us on a guided virtual tour of their native gardens, two lovely mature gardens and one newly established with sheets of everlastings. They really did well this year with the long mild and wet winter.

The November meeting was addressed by Ben Miller, Science Director at the Botanic Gardens and Parks Authority, on Fire in Kings Park and other urban remnants. This was also our AGM at which we lost our treasurer Ross Cockerell and Marta Rossignoli, although all other members of the committee re-joined including me as our new president. Our 2017 committee is Lin Barrow, Jim Barrow, Mark Brundrett, Jolanda Keeble, Bronwen Keighery, Nina McLaren, Brian Moyle and Lyn Roberts. We are still to replace our treasurer, if you can help please contact me.

A very convivial end of year party was held with Northern Suburbs at Perry House in December despite some very unseasonal rains and Greg and Brian trying to operate the BBQ cooking at half speed.

A reminder to all that the Honor Venning Library is open on the first Saturday of each month from 1 to 3pm at Perry House in Bold Park (as well as Tues and Thurs normal office hours). All Wildflower Society members are welcome to come and browse and borrow from our collection of books on plants.

Don't forget our email notices for each meeting. Nina McLaren puts these together and adds other interesting Society information. If you would like to get this email each month and you are not on the list, let Perth Branch know your email address (contact Nina or Bronwen).

Greg Keighery, President

South West Capes Branch

Although our new branch has not developed to the stage of having a regular monthly meeting, we have managed a monthly activity since we began our activities in June last year. We seem to be developing a pattern of meetings in the Duggan Pavilion in Cowaramup (about 'half-way house' for our branch region which stretches from Capel to

Augusta), bush walks, and garden visits. We have decided to limit bush walks and garden visits to Society members, but our hall meetings are open to members and visitors.

We ended the year with an October bush walk in Augusta (around and about Flat Rock) led by Jenny Kikeros and Jan Gathe. As with previous walks, several of us attempted a list, and lots of photos were taken. In November, we visited Graham and Shirley Fisher's garden in Dunsborough. Prior to the garden visit, we had a committee meeting planning for 2017 and created two subcommittees, Conservation and Garden Cultivation.

Our 2017 year begins with a talk by committee member Shirley Fisher on Garden Design in February, a walk in the Rapids Conservation Park in March, an AGM meeting in April, and a talk by Phil James on Eremophilas in May.

Richard Clark

Western Australian Carrot Relatives

The Carrot family (Apiaceae or Umbelliferae*) is one of the oldest recognised natural groupings of plants, and the first flowering plant family recognised by botanists in the late 16th century. With over 3,700 species distributed in 434 genera, the family is one of the larger plant families and is particularly diverse in the Northern Hemisphere. However, it is not a group that immediately springs to mind when considering the floral displays and wealth of species found in Western Australia (photos cover, page 21 and centrefold).

Members such as carrots and parsnips are important worldwide food plants. Parsnips were a key winter food in Europe, until displaced by potatoes from the Americas. A number are culinary herbs or spices of very long usage – Caraway, Coriander, Cumin, Fennel and Parsley, and one, Hemlock is a famous poison. Our native carrots have also had a long history of human usage: *Platysace* tubers were an important food source for Aboriginal people (photos back cover); *Centella asiatica* (Guta Kola) is a widely used herbal medicine for wound healing and rheumatism; and *Apium prostratum* (a close relative of celery) was used as a scurvy cure by sailors as it is high in Vitamin C. One of the most widely grown WA natives in the world is the Rottneest Lace Flower (*Trachymene coerulea*, photos centrefold). First cultivated in England in 1828, it is now usually sold as seed for bedding annuals or cut flowers as 'Didiscus' (an old name for Trachymene), 'Blue Lace' or 'Madonna' and has blue, white and pink cultivars.

All species have small simple flowers (most photos). As in most members of the family and many species in WA it is the umbrella-shaped inflorescence that is conspicuous. In some genera the inflorescence has large bracts: conspicuous petal-like bracts in *Xanthosia*, *Actinotus* (photos centrefold) and *Chlaenosciadium*; and in spiky green bracts in *Eryngium* (photos centrefold). Many species in the group flower in late spring and summer when few other plants are flowering but days are warm and pollinators active. Flowers are typically blue or white, with readily accessible nectar and are visited and pollinated by a wide range of bees, wasps, flies and beetles (photo centrefold). Some of the very small annuals with very inconspicuous flowers (cover and inside front cover) are largely self-pollinating.

Members of the family are largely herbs (non-woody plants, see most photos). Unlike the slower growing shrubs with specialised nutrient grabbing roots of the Myrtaceae,



Left: a native bee flying in to feed on a flowering *Xanthorrhoea*. Photo Geoff Corrick

Below left: Roger Harington with the Rob Harington Award celebratory vase. Photo Kim Sarti

Below right:

top - Peter Coyle (RGVA) and Anne Rick (Society) tagging. Photo Judith Harvey

below - *Myosotis australis* plant and insert closer view flowers. Photo Peter Coyle





Top (from
pinnatifida
peltigera
Actinotus
summer
Garden



Top left to right): Three *Eryngium* forms: *E. pinnatifidum* subsp. *pinnatifidum* (Dun Craig); *E. pinnatifidum* Capes Form (Moses Rock), *E. muirii* ms (from Claypan north of Lake Muir); *Pentapeltis* sp. in the Jarrah forest; and *Trachymene dendrothrix* flowers and seeds (Kimberley). **Middle:** *Trachymene leucocephalus*; *Xanthosia huegelii*; *X. roundifolia* (with Syrphid pollinator); Karri forest after fire with insert *Trachymene grandis* flower and seed. **Below left** *Trachymene caerulea* carpet on Island without summer fire, inset flowers.



Above *Actinotus leucocephalus* massed along a creekline in the Wandoo Conservation Park with no evidence of a summer fire. **Below** *Platysace juncea* on granite along Albany Highway. Summer photos by Bronwen Keighery



Proteaceae and the Fabaceae the carrots have found ways to grow, flower and seed in a few months and so deal with our extremely nutrient-poor soils, low and erratic rainfall. Of the more than 110 native species of Apiaceae in WA, 57 are annuals. There are 16 weeds, mostly in localised or minor populations. The aquatic, *Hydrocotyle ranunculoides* has caused major problems in the artificial wetland behind Kent Street Weir on the Canning River.

The majority of species are found in the Southwest. There are six endemic genera in the Southwest – *Brachyscias* (photo inside front cover), *Chlaenosciadium*, *Homalosciadium* (photo inside front cover), *Pentapeltis* (photo centrefold), *Schoenolaena* and *Neosciadium*. These groups are not diverse, most with a single species, and a few with two. *Brachyscias* is a very rare species. There are five large genera (photos centrefold and back and inside back covers): *Hydrocotyle* (30), *Trachymene* (22), *Platysace* (19), *Xanthosia* (14) and *Actinotus* (10). The later four genera are across Australia but most diverse in WA. *Trachymene* is the most widespread with eight species in the Desert and Kimberley (photo centrefold) and 11 in the Southwest. Generally the life form, leaves and inflorescence structure distinguishes the genera and species, but in the most diverse groups (*Hydrocotyle* and *Trachymene*) seed shape and surface patterning/appendages must be used. In these cases seeding material must be collected for identification (see photos centrefold and cover).

So how has a group of plants that rely on rapid growth adapted and diversified with our low and erratic rainfall and very nutrient poor soils? One strategy is to grow after fires (photo centrefold), when nutrients are released and competition with shrubs for water and light is also minimised. Some have become wetland specialists (where water is not limiting during growth), others have become mini herbs or shrubs to occupy micro-habitats or have evolved methods to store water and nutrients or have a combination of these characteristics.

Wetland specialists

Growing in wetlands, often in shallow water and avoiding the summer drought has been how the tuberous perennials, *Schoenolaena* and *Eryngium* flourish. *Eryngium* (commonly called Sea Rockets) is a well-known cosmopolitan genus. The Southwest Claypan communities support a variety of species, many yet to be named (photos centrefold). A comparable diversity of species and forms is also found in the claypans of Mediterranean areas of California. In California they are called ‘Vernal Pools’, that is pools forming from rainwater in spring. *Schoenolaena* grows as the Claypans dry, and flowers in summer generally after its soft tubular leaves have died.

Hydrocotyle lemnoides (photo back cover), our only true aquatic carrot, is an annual of Claypans: germinating with the flooding of Claypans in winter; and when they are full producing small reddish flowers that are fly pollinated (flies skid across the water); and then seeding and dying before they dry. Speichert & Speichert (2004, page 198) have this species as a water plant being grown in North America, but the plant they list appears to be a perennial.

Small is beautiful

Many of our Carrots, members of the genera *Daucus*, *Apium*, *Hydrocotyle*, *Homalosciadium*, *Neosciadium* and *Trachymene* have reduced their size to be able to



**EREMOPHILA
NATIVE NURSERY
ORANGE VALLEY
NURSERY**

Open by appointment only

Phone 08 9293 2569

Mob 0429 325 693

Email: phil@eremophila.com.au



**WILDFLOWER
TOURS
LESUEUR AREA**

Joy and Don Williams
will be conducting
wildflower tours in the

Lesueur, Alexander Morrison, Coomallo,
Badgingarra, Eneabba and 'Hi-Vallee'
areas again this wildflower season.

All size groups; 1 to several days.

Explore with knowledgeable
local guides. All interest groups –
wildflowers, birdwatchers, nature lovers,
photographers and bushwalkers –
catered for.

Accommodation and transport can be
arranged. Camping available.

Further information and bookings:

Ring Joy or Don on 08 9652 3035

Mob 0427 230 345 OR write to

'Hi-Vallee', Badgingarra WA 6521

E-mail: hivallee@westnet.com.au

complete their life cycles with a minimum of rain or nutrient's often in very small favourable microhabitats. These include granite moss swards (*Brachyscias*, *Hydrocotyle*, *Homalosciadium* and *Trachymene*) and freshwater seeps around salt lakes (*Apium*, *Neosciadium* and *Hydrocotyle*). Many are also abundant in small depressions the first year after fires. Most of these have hooks, specialised structures or hairs to aid dispersal of their fruits.

Fire adapted annuals

Currently when the rains come to the semi-arid regions WA is world renowned for the displays of Everlastings of the Daisy family found in loamy soils generally under Acacias. However, in the past, when the Southwest was continuous bush there were occasional very large landscape scale summer fires. In the following spring and summer the bushland became a carpet of blue and/or white blossoms of Lace Flowers and/or Flannel Flowers (photo page 24). Greg remembers such an event in 1975 between Newdegate and Cape Arid when he observed an almost continuous sea of white from *Trachymene* and *Actinotus* blossom after a single very large fire. Such displays can still be seen in the forest after summer fires in the Karri (photo centrefold), with large displays of *Trachymene grandis* or around Perth with vistas of Blue Lace Flowers (*T. coerulea*) after the recent large-scale fire in Yalgorup. Many of these species show very strong dormancy of their seeds, only germinating after fire. Interestingly some populations of both *Trachymene* and *Actinotus* have produced seed without this dormancy. Such populations are found on Rottnest and

Garden Island (photo centrefold) or in the Perth Hills on granites (photo page 24) and give mass displays each year, if conditions are favourable.

Several members of this group are declared rare in WA, including *Brachyscias verrucundus* (photo inside front cover) which is a post-fire annual. This species may be more common than thought, being found in large localised populations around granite rocks after the 2015 Pemberton and Northcliffe fires. Two other Wheatbelt post-fire species, *Chlaenosciadium gardneri* and *Actinotus superbus*, have been recommended as threatened flora because they are now rarely encountered. There are other rare species including an endemic subspecies of *Apium prostratum* from the Porongurup Range and the highly localised *Actinotus whicherianus* from the Whicher Scarp.

Shrubby 'Herbs'

There are shrubby members of *Actinotus*, *Xanthosia* and *Platysace*. Some widespread species, especially in *Xanthosia*, have become very 'mini' shrubs, which are also favoured by fires, growing and flowering within a year after the fire, but also persisting for several years longer. Others from *Pentapeltis* and *Platysace* have rhizomes or tubers for nutrient and water storage, enabling them to flower in summer and survive fires. A number of *Platysace* species: *P. cirrosa* (Kahna or Native Potato), *P. effusa*, *P. maxwellii* (Coanna) and *P. deflexa* (Youlk) produce large edible tubers that were significant foods for Noongar peoples and have considerable potential as a crop (Woodall et al, 2010). Two *Xanthosia* species (*X. rotundifolia* and *X. tomentosa*) are relatively large low shrubs that resprout after fires and have large showy inflorescences and deserve to be more widely cultivated.

The Carrot relatives in WA are a widespread and diverse group that should be better known and grown, especially in WA. Some are particularly beautiful plants: *Actinotus superbus*, *A. leucocephalus*, *A. whicherianus*, *Trachymene coerulea*, *Trachymene grandis*, the Wheatbelt form of *Xanthosia atkinsoniana*, *Xanthosia rotundifolia* and *X. tomentosa*.

Greg and Bronwen Keighery

References

Speichert, G & Speichert, S. (2004). Encyclopedia of Water Garden Plants. Timber Press, Oregon.

Woodall, GS, Moule, ML, Eckersley, P, Boxshall, B & Puglisi, B. (2010). New Root Vegetables for the Native Food Industry. Rural Industries Development Corporation Publication 09/161.

*Historically two families which have flowers in umbels (in an umbrella-like inflorescence see photos centrefold) have been recognised - Apiaceae and Araliaceae (mainly tropical and Southern Hemisphere). Apiaceae have dry fruit (*Trachymene* photos front cover and centrefold) and Araliaceae fleshy fruit (such as Ivy). Recently molecular information suggests that 5 groups could be recognised, segregating *Centella* into a separate family and finding that the Hydrocotyloideae subfamily of the Apiaceae is allied to the Araliaceae. The WA Herbarium follows this grouping with *Hydrocotyle* and *Trachymene* being placed in the Araliaceae. However, most treatments do not follow this taxonomy, some include Araliaceae in Apiaceae. Here *Hydrocotyle* and *Trachymene* are retained in the Apiaceae.

Book review - Standing on shoulders

Reproduced with amendments from Australasian Systematic Botany Society Newsletter 167: 51–56 (June 2016)

Georgiana Molloy: The Mind that Shines

By Bernice Barry, Picador Pan Macmillan Australia, Sydney (2016), pp. [xi], 336, 32 unnumbered pp of colour plates, softcover, ISBN 978-1-74354-914-8, \$39.99. Also available as an ebook.

Because this is the third biography of Georgiana Molloy I have included comparison with the two earlier ones: *Portrait with Background: A Life of Georgiana Molloy* by Alexandra Hasluck, Oxford University Press, Melbourne (1955, casebound, reprinted several times in softcover), pp. xii, 284, 8 unnumbered pp of plates; *An All Consuming Passion: Origins, Modernity and the Australian Life of Georgiana Molloy* by William Lines, Allen & Unwin, St Leonards (1994), pp. xi, 398, 16 unnumbered pp of plates, casebound, ISBN 1863735534, originally \$39.95.

The new book is already a second edition. The text is hardly changed from the first, self-published edition (Redgate Consultants, Witchcliffe, W.A., 2015, pp. [ix], 373, 32 unnumbered pp of colour plates, softcover, ISBN 978-0-9942064-0-4, \$34.95). A different font with closer lines has brought the page number down but with no loss of readability. A number of plates have been omitted (mainly less strictly relevant to Georgiana's story) and new ones added (especially plant specimens dried and fresh). Some captions have been extended. The design has been amended, with some plates larger and some smaller, generally an improvement. The original maps of Britain, Europe and Western Australia have been replaced with large-scale ones of Dunbartonshire and the Augusta district. In the endnotes the numbers are larger and easier to read (but still small in the text), while the index is in a more user-friendly type size. The index is also now in its rightful place at the end of the book (well, almost, being followed by the acknowledgments). There is a new blurb on the back cover. For the keen book collector these changes mean that you should have both editions!

First, I have to declare an interest in this book. You could say I had a hand in it, two hands in fact, since they appear in a photograph on p. 134, one pointing at one of Georgiana's specimens at Kew in 2005.

Bernice Barry has produced an admirable new book about Georgiana Molloy, quite a challenge given that there are already two good accounts of this early settler and plant collector. She has unearthed new facts, reinterpreted documents and widened the reader's understanding with illustrations old and new. Just a few examples are mentioned here.

Why such interest in one who, in the overall history of plant collecting in Australia, is a relatively minor figure (she made possibly 400 collections)? One reason may be that, through her diaries and correspondence, records of others such as her husband, other early settlers and her descendants, not to mention the accolades given by contemporary horticulturalists in Britain, we have a far more detailed picture of her life, set in the social, religious, political and economic mores of the times, than for most other settlers. Her plant collecting has attracted more interest among non-botanists than probably any other

early collector. Each of the books follows the same broad outline, from the early years of Georgiana Kennedy and John Molloy (JM) to their marriage, migration and settlement at Augusta, the move to the Vasse and re-establishment there, Georgiana's death and the later years of JM and the children.

Like Georgiana, Bernice Barry came from Britain to start a new home on a bush block in the far south-west, albeit 170 years later, and learnt to love Australian plants. From a career in the development of school curricula, she turned to a long-standing interest in writing and history. Becoming interested in this pious woman, a settler facing the trials of establishing a home in the bush (and heavy forest at that) who became a successful botanical collector, her investigations began to resolve some discrepancies in earlier accounts and became an 'all-consuming pursuit' of the truth about Georgiana's life. Not content to accept the previous accounts, especially of Georgiana's early life, Barry followed up all the known sources and found new ones, in the process filling gaps and correcting errors. She sought to uncover more details of the lives of Georgiana and her husband, and clearly she is one who doesn't give up on a challenge. It led to her decision to pass on the results of her quest with 'what I had learned about exploring the past'. An enlivening feature of her book is the interweaving of accounts of her research with the narrative—the thrills of discovery or enlightenment, the disappointments, serendipity, many instances of assistance from those consulted and responsible for archival material, both public and private. In Britain she visited places where Georgiana lived and attended school. She found details that explained her developing awareness and attitudes that led to her leaving home and going to Scotland, where she lived with the Dunlop family until her marriage. In Australia she lives on the doorstep for seeing and being drawn into the environment where the Molloyes settled. Her account is lit up with images of places, manuscripts and letters that take us along on her journey.

Georgiana's interest in gardening and botany was well founded before leaving Britain. She had already pressed specimens as a pastime, and enjoyed gardening at Roseneath, Scotland. From various sources she acquired seeds and plants and took with her a hortus siccus, as they were then known, containing specimens collected since 1821. She obtained more seeds and bulbs at the Cape. Establishing her garden gave her a much-needed diversion and inspiration (especially religious) after the birth and death of her first child just days after arrival, followed by a miscarriage. The early years were a struggle to clear the forest and establish a farm, in a small community that generally was anything but religious and with many trials and tribulations. Eighteen months later, with her healthy second child thriving, and her garden blooming but with English flowers, Georgiana still found the 'bush' disturbing. From then on, however, she began to venture out and notice the forms, colours and scents of Australian flowers.

In December 1836 her life changed with the arrival of a letter from English horticulturalist James Mangles, sending seeds and a request to collect seeds of Australian plants accompanied by pressed specimens to be mounted in a hortus siccus that he also sent. For Georgiana, he was well-connected—he was a cousin of Governor Stirling's wife Ellen. Starved of the companionship of people of similar intellectual and social standing, Georgiana unburdened herself, her trials and her joys, to Mangles, who proved a generous, compassionate correspondent. The prospect of exploring the bush with a defined

goal offered her both respite from the everyday tasks of the home and the opportunity to do something meaningful beyond the domestic. After her son was drowned in a well, it also offered solace. She came to feel that she was an individual of intellectual worth and potential not limited by her daily life. Her daughters were old enough to accompany her and, indeed, became useful ‘assistants’. She made a duplicate set of specimens for reference when she received the names and, of course, raised some species in her own garden, making her one of the earliest growers of native plants in this country.

By the time of their departure from Augusta for the Vasse, Georgiana, in keeping with her religious views, felt that she was leaving paradise, but as a place of joy, not one of impending catastrophe. As Lines expressed it, she now felt that ‘the world, the wilderness, had its own beauty and purpose’. She was disappointed in the landscape at the Vasse but soon came to recognise its potential for botanical exploration.

Each book describes the life of Georgiana and her husband John Molloy and gives details of other members of their families, as well as those with whom they were associated during their lives in Britain and in Western Australia. Generally the events and dates coincide, the chief discrepancies being in the early life of John Molloy. During his lifetime he was guarded about his origin, leading to rumours such as that he was descended illegitimately from royalty. Barry went much further in her research and uncovered the facts, sometimes as a result of revisiting documents with new enlightenment. JM proved to have a relatively humble background (an Irish father who came to London and was a shoemaker, his mother a London girl). He was born on 5 September 1786, probably in St Giles where he was baptised but he sometimes gave it as Harrow where the family lived. The story that he was educated at Harrow School arose from a mis-interpretation of ‘Molloy Jn’ in the school’s records as Molloy, John, when in fact it referred to ‘Molloy Junior’ from another Molloy family (and different in age). In fact Georgiana’s JM signed on as a volunteer with the Royal Navy in 1801, serving until 1805. He then bought a commission in the Oxford Militia, then in 1807 bought a commission in the 95th Regiment of Foot of the regular army. He served in the Peninsular Campaign, fought and was wounded at Waterloo. He remained in the army until deciding to emigrate to the Swan River when he decided also that he should have a wife. He had met Georgiana Kennedy at Crosby in 1821, and it would seem that there was an attraction from the start. Barry realised that a draft letter signed with a nickname that had lain in the Molloy papers was a declaration of love but it was another year before she resolved the problem of the nickname that linked it definitely to John Molloy.

As she extended her research Barry came to realise that she was ‘treading in someone else’s footsteps’, someone long ago, and eventually realised that it was Georgiana’s granddaughter, Georgie Hale, who had been researching Georgiana and made copies of letters that were lost until found in the roof of a house and sent to the Augusta Historical Society in 1985. Likewise a sewing box, now held by the National Trust of Western Australia at Wonnerup, proved to be that owned by Georgiana from about the age of 20, still containing many items that had been important in her life such as two of her visiting cards, one in the name of Kennedy, one Molloy.

Barry found that the date of the visit by Georgiana’s sister Mary was several months earlier than given by Hasluck and Lines and in fact coincided with that of Ludwig Preiss.

She realised that a plan of their house and garden drawn by JM and long taken to be that at Fairlawn on the Vasse River was, in fact the garden at Augusta, and other details of their life there then fell into place.

Hasluck

Extracts of Georgiana's letters were published in the Journal of the Historical Society of Western Australia in 1929 (with the spelling 'Georgina' which Hasluck was able to correct). These attracted the interest of historian Alexandra Hasluck. She was one of the first to become aware of, and draw attention to, the 'mass of material (all hand-written) contained in the files of the Colonial Secretary's Office, Perth, and now in the Archives Branch of the Perth Public Library, which relates to the early history of the south-western corner of Australia'. She followed this up with members of Georgiana's descendants, both in Australia and in Britain, and other people and sources such as the Royal Horticultural Society in London (at a time when contact was by phone or mail). Her aims were to do justice to Georgiana as a pioneer botanist and to describe the ordinary life of settlers in the first decade or so of the colony. It could be said that her book is a very successful pioneering account of those years.

Lines

Lines' primary interest was placing Georgiana more deeply in the religious, social and political setting of the time. He also set the Australian scene with accounts of its geological and biological evolution, its settlement by Aborigines, and their beliefs and way of life. Then follows the political, social and economic scene in Britain into which Georgiana was born, and the events that led to her marriage and migration. Besides the material in Perth he consulted the Cumbria Record Office where Kennedy papers are held and in Scotland visited Keppoch House and Rosneath (sic) Church, then thought to have been where Georgiana and John were married.

His is also a more searching discussion of the Nyungar people, their perception of the new settlers and vice versa, and the interaction between them. He has a degree in economics, the purpose of which, he wrote in *False Economy* (see notice in ASBS Newsletter 95: 15, 1998), 'is not to acquire a set of ready-made answers to economic questions, but to learn how to avoid being deceived by economists'. I should think he enjoyed reading N.N. Taleb's book *The Black Swan: The Impact of the Highly Improbable* (2007) which 'explores our blindness with respect to randomness, particularly the large deviations', and hence why economists and social scientists are so bad at their jobs.

I have to admit to ignorance of the meaning of 'Modernity' in the subtitle for his book.

The Trio

This trio is a good example of research building on what has gone before. Each author has done a great deal of research within the parameters of what could be accessed reasonably at the time. Each added to what had gone before, correcting facts and unearthing new ones.

Each in their way succeeded admirably. I can recommend reading the three books. With their different styles and perspectives there is no loss of interest in reading of

the same events, and each broadens the perspective. Barry, for example, adds to the understanding of Georgiana's devoutness with the observation that she was 'also a widely informed, independent thinker and understood that there were many ways to know God.' During her time in Scotland, far from being 'almost a retreat' as interpreted by Lines, she embraced the communities and their society. At the same time she enjoyed the poetry of Burns, hardly the most chaste of poets, and took a book of his poetry to Australia (the subtitle to Barry's book is from his *On Cessnock Banks*). She observed both the people and the natural environment. Barry visited these areas to get a better feel for the places where Georgiana spent some happy years. One visit to Scotland even coincided with the sale of Keppoch House which she was able to visit, roam through its rooms, and solve the question of where Georgiana and John's marriage took place. Behind the house was still the 'secret' flower garden where Georgiana had gardened, where she had gathered her wedding flowers. Photographs help our understanding, also. On this side of the world she photographed places of special meaning to Georgiana, such as the granite slope on the Blackwood where she collected, Castle Rock and Bay where Georgiana dreamed of having a home. There are photos of some of Georgiana's specimens, some of the living plants.

As the novelist Joseph Conrad wrote, his task as a writer was 'to make you see', and first-hand experience in places helps to achieve this end. And, as a recent review of a book on the writer Alan Moorehead by Les Carlyon said, 'history reads better if one walked the ground in the hope of communing with ghosts'. My understanding of people I've studied, such as William Dampier, has been greatly enriched by visiting the places where he landed and imagining him being there.

Hasluck and Barry, our two women authors, generally refer to Georgiana by her first name, occasionally (after her marriage) as Mrs Molloy. This brings us into closer intimacy with her, compared with Lines' style in which she is usually 'Molloy'. All three usually refer to John as Captain Molloy, but sometimes Lines uses just the family name for him, too, fortunately careful to avoid ambiguity.

In Perth Barry realised the connection between the bells of St Martin in the Fields in London that would have rung out on the day when JM was baptised there in 1786, the same bells that now peal from the Bell Tower on the foreshore at the spot where the Molloyes set foot in Perth in 1830.

A document that she studied in the Kennedy papers in Cumbria was a long letter of April 1831, describing the voyage out and the first year at Augusta, from Georgiana to her friend Mrs Frances Birkett in Carlisle, though it was thought by Lines to have been to her own family. In fact, the letter had been forwarded to Georgiana's mother whose correspondence survived, while Mrs Birkett's did not. As Barry wrote, 'Sometimes history extends a kindness, a gift from the past to the future.'

Regarding the collection of specimens that Georgiana sent to Mangles, it may be noted that many were brought to her—by her husband and her older children, by other settlers such as Charlotte Heppingstone, and by Aborigines. Even soldiers walking between the Vasse and Augusta brought her specimens. They could be thought of as silent collectors, although JM is acknowledged on the lectotype of *Adenanthos barbiger*, as 'Mrs Capt. Molloy 1839'. But Georgiana was responsible for drying and labelling

them all. She also received some from Ludwig Preiss when he visited in December 1839, but she thought them so ‘rough and ungainly’ that she could not mount them with hers, keeping them separate (did any of these end up in herbaria and, if so, were they attributed to Georgiana or Preiss?). She picked up a few Nyungar names, such as *danja* for *Xylomelum occidentale*, gathered for her by JM on a walk to Augusta and placed under a rock to dry out, to be collected on the return walk. James Drummond also visited her, in June 1842. He it was who collected the specimens of ‘the finest species of *Boronia*’ and named it after Georgiana.

Georgiana’s collections, together with those of Drummond and other collectors, formed the basis of John Lindley’s Swan River Appendix in which some 283 new species were described. She was delighted to receive a copy of this from Mangles in June 1840 and to note her name sometimes cited as collector (for most, Lindley gave no collector at all with the descriptions). She was acknowledged in other horticultural publications.

No herbarium has a full set of Georgiana’s collections. Mangles forwarded them to Lindley and to Joseph Paxton. Both were delighted with the array of species and the care with which they had been gathered and packed. The best set is at Cambridge (CGE), thanks to Lindley’s part in naming them, with some at Kew (K), Berlin (B) and Montpellier (MPU). For reason(s) unknown, the numbers given by Georgiana were not recorded on the sheets. The fate of her own set is unknown. Perhaps it was discarded when JM auctioned most of his belongings in 1849, before setting off to visit England. Her seeds Mangles sent to 15 horticulturalists around Britain.

From a botanical perspective it would be good to have names for plants mentioned particularly by Georgiana in her letters, such as a ‘small, neat, white blossom on a furze looking bush’, but this will require yet further research. As time progressed she learnt many names and could use them in her letters but some references are just to their numbers.

Georgiana is commemorated in just one plant name, Drummond’s *Boronia molloyae*, and that almost didn’t happen (P.G. Wilson, *Nuytsia* 12: 140, 1998). A proteaceous genus *Molloya* was published by Meisner in 1855 (as a replacement for *Fitchia* and based on a species that Georgiana never saw) but it proved to be synonymous with *Strangea*.

There remained a small mystery: what were the ‘little blue flowers’ that Georgiana placed on her first-born’s body as they buried it on that early June day in 1830? It was too early in the season for the many blue-flowered plants of mid-winter to spring such as *Hardenbergia*, *Hovea*, blue orchids and *Dampiera*. The most likely is *Billardiera fusiformis* which may still be seen in remnant bush in Augusta, flowering in winter. Another possibility is *Lobelia anceps* that grows on the shore at the mouth of the inlet and may also be seen in flower at this season.

It’s pleasing to read the acknowledgements of these books, in particular to those who are too often taken for granted but who are essential to research: librarians and archivists. Hasluck acknowledged the then-Archives Branch of the Perth Public Library, while Lines wrote of the ‘eminently civilised Battye Library of Perth’, and of the ‘Donors, curators, staff, and volunteers who ... make documents accessible and useful’. The archivists at the Cumbria Record Office, Carlisle, epitomised ‘the very best Anglo-Saxon traditions of openness, access, and cooperation’. Barry acknowledged the (now) Cumbria Archive

Centre for ‘years of five-star customer service’.

On practical editorial matters, I like having the endnotes numbered in a single sequence, rather than a new one for each chapter (though the numbers in the text, in a small, fine font, are hard to read). It can be annoying to turn to these and then realise that you haven’t noted the chapter number or title.

Only a few plates are repeated in each book, so in this respect they complement each other. In each book the plates are grouped on unnumbered pages. In Hasluck and Lines they are numbered, which assists citation, but in Barry they are not so you have to say ‘between pages *** and ***’. For ease of citation it would be good to have the pages of plates (or at least the individual plates) numbered. Barry also has illustrations within the text that are easily cited.

Both Hasluck and Lines have comprehensive indexes but Barry has one only to people plus the numbers of a handful of the 630 endnotes.

Errors are very few and not misleading except that on p. 116 the date of Stirling’s arrival at the Swan River is given as August (instead of June) 1829.

In case anyone comes across it I should mention a fourth book, *Georgiana: Woman of Flowers* by Libby Hathorn, Hachette Livre Australia Pty Ltd, Sydney (2008), pp (vi), 298. It’s a historical novel, aimed especially at young adults. While much of the story is drawn from Georgiana’s life and those of her husband and fellow colonists, there are fictional threads woven through it. The names of a few characters have been changed, quite acceptable in a work of fiction, but I don’t know if it’s ‘literary licence’ or in error that some facts are incorrect, such as that the voyage out sailed from Plymouth instead of Portsmouth (mentioned several times including the back cover blurb, but at one point in the text Portsmouth slipped in). From a botanical aspect some erroneous additions seem unnecessary, such as placing mangroves in Flinders Bay, red-flowering gum and scented boronia in the forest there, and the two vignettes of flora that head alternate chapters showing two other flowers that Georgiana never saw—one possibly an *Angophora* from N.S.W. (also on the cover), the other *Banksia coccinea*.

Alex George, Kardinya

Woodland (shade) plants

I have been asked which plants are doing well in my woodland, i.e. which succeed in shade. My woodland is dominated by Marri (local native here), a large Karri (see Newsletter 50 (4): 12–13, Nov. 2012), an old WA Peppermint (*Agonis flexuosa*) and an old paperbark (*Melaleuca raphiophylla*). About a quarter of the day’s sunlight reaches the ground. I’ve developed the understorey slowly with natives since 2006 but mostly since 2011 (photos inside back cover). So far the following have thrived and flowered, and some have set seed. There would certainly be more that I haven’t tried (and now don’t have room for). As always, I caution that what does well in one situation may not in another. To a large extent we are still at the ‘trial and error’ stage of growing our native plants. The successful plants are: *Adenanthos cygnorum*; *Austrostipa flavescens* (now self-sowing); *Banksia grandis*; *Boronia crenulata*; *Bossiaea eriocarpa*; *Calothamnus rupestris*; *Casuarina fraseriana* (slow but very healthy); *Daviesia physodes*; *Diplolaena angustifolia*

(see Newsletter 53 (1): 15–16, Feb. 2015); *Dryandra praemorsa* var. *praemorsa*; *Gastrolobium celsianum*; *Gastrolobium praemorsum*; *Grevillea crithmifolia*; *Hakea prostrata* (local form); *Hakea undulata*; *Hardenbergia comptoniana* (see Newsletter 52 (4): 1, 15–16, Nov. 2014); *Hibbertia cuneiformis* (now self-sowing); *Hibbertia grossulariaefolia*; *Jacksonia furcellata*; *Kunzea glabrescens*; *Melaleuca lateriflora*; *Ricinocarpus undulatus?* (dwarf form); *Scaevola crassifolia*; *Spyridium globulosum*; *Templetonia retusa* (now self-sowing); *Thysanotus sparteus*; and *Xanthorrhoea gracilis* (not yet flowered).

The following have performed well but I consider short-lived (less than 10 years): *Acacia lasiocarpa* *Rhodanthe chlorocephala* subsp. *rosea* (does well as a self-sowing, spring-flowering annual); *Chorizema cordatum* (now self-sowing); *Grevillea pimelioides*; *Kennedia prostrata* (now self-sowing); *Pimelea ferruginea*; and *Thomasia purpurea*.

I have set out further species but they are less than three years old so as yet I can't comment on their performance. There is also a Firewheel Tree (*Stenocarpus sinuatus*), planted c. 30 years ago, and an older tree of *Macadamia integrifolia*, the latter's fruit a favourite with Carnaby's Cockatoos, for which reason I planted another five years ago although it will be some years before it fruits.

Alex George, Kardinya

Native plants don't need phosphate!

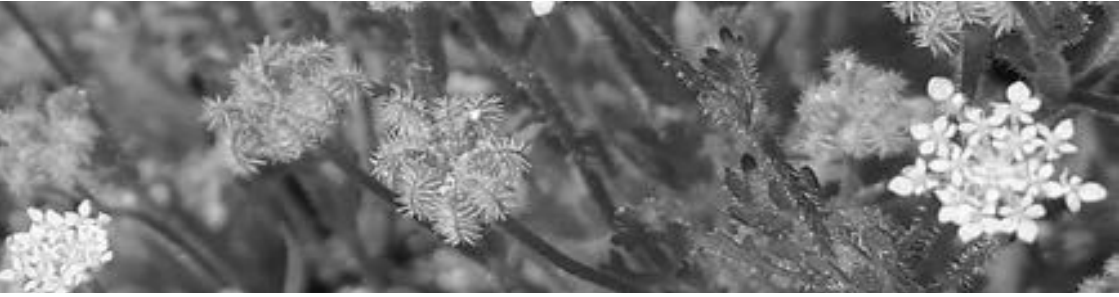
How often have you heard that? If it were true, it would mean that all native plants were the same (and that all soils are the same). That is plainly silly. Just look around: you will find eucalypts on the higher-fertility dunes closer to the coast (Tuart, Jarrah, Marri) but you won't find many in the Banksia woodland growing on the oldest dunes. Such differences in the ability to obtain and use phosphate can provide a challenge for the home gardener.

In autumn 2015, I bought a nice *Eucalyptus torquata*. I thought it would fill up a vacant spot with a 5 m tall *Eucalyptus erythrocorys* on one side, and a couple of thriving Grevilleas on the other. I had no reason to suspect that soil fertility would limit its growth. But it just would not grow; about a year and a half later it was no bigger than when it was bought and seemed to be declining steadily. Eventually I took a good look at it. And when I did, it was obviously very phosphate deficient. Why had I not seen that earlier? The symptoms were classical even including purple colours in the leaves (photo inside backcover). When a plant is so phosphate deficient that it shows such symptoms, then it is phosphate deficient indeed. There was nothing for it but to apply a handful of fertiliser, keeping it very close to the base of the tree. It only took a week or so for the plant to respond producing lots of green shoots. I wonder how often the doctrine that you do not apply phosphate to native plants has limited the growth of some species.

But you have to discriminate. Just a few metres on the other side of the thriving *Grevillea*, I had planted a Black Kangaroo Paw. It grew quite well at first and even flowered in spring. Then, in early summer, it really started to grow – but turned rather chlorotic (photo inside backcover). That is a sign of phosphorus toxicity in kangaroo paws. The treatment is to apply iron chelate and this seems to be working.

Kermit was right: it is not easy being green.

Jim Barrow



Above: The most common *Trachymene* in the Perth area, *T. pilosa*. The plants are hairy and the fruit are covered in barbs. Note in the flower head the outer flowers have one big petal. Photo B Keighery

Rare Flora Search and Rescue Project

This new and exciting project, a collaboration between The Wildflower Society, WWF-Australia and the Department of Parks and Wildlife (DPaW), is looking for community volunteers to help with the search for our rare and poorly known flora. These species, listed as Priority 1 and 2 by DPaW, are those that are under threat and known from only a few records, but are not protected, as they are in need of further survey to ascertain their conservation status. The project will focus on 50 species of Priority 1 and 2 flora known from the Lesueur Sandplains, Esperance and eastern Wheatbelt areas. We aim to inform, train, support and equip community volunteers to enable them to continue to search for these rare and poorly known species independently, in the future.

We are now seeking Expressions of Interest from community groups or individuals interested in becoming part of this project. Small teams will be formed to cover the range of skills required. Roles include; a registered user of the collection tool, volunteers with some basic botanical knowledge (to understand plant descriptions), GPS operators, licenced plant collectors, drivers and searchers.

Registration as a DPaW Volunteer is required to ensure appropriate health and safety training, insurance cover and eligibility for volunteer rewards. There will be training, organised group excursions and opportunities for skilled individuals and small groups to survey independently. A smart phone app, developed specifically for this project, will enable the collection and collation of information from volunteers in the field. Fact sheets will be issued for each target species with information about existing and potential locations, plant descriptions, habitat, other indicator species and key differences between similar common and priority species. Permission to search on private property will also be sought.

This project is funded by State NRM through the Community Capability Grants Program.

If you are interested in being involved in this exciting project, please contact Judith Harvey at Judith.Harvey@dpaw.wa.gov.au or on 9219 9050 or 0409 290 610. Alternatively, contact Shenaye Hummerston at SHummerston@wwf.org.au or on 0455 066 897.

Judith Harvey



Above: *Banksia idiogenes* a Priority 1 species found in the Lake Grace Area.

;Photo Margaret Pieroni

Forget-me-not not forgotten any more

Rediscovery of Myosotis australis on Rottnest Island

Myosotis australis, a native annual commonly known as the Southern Forget-me-not, is in the Boraginaceae family along with the culinary herb Borage and Paterson's Curse. It has only been collected previously from nine locations in Western Australia including the islands of Rottnest, Garden, Bald and Woody Island (collected from the latter by Elizabeth Rippey) as well as near Albany, and Bridgetown.

The collection(s) from Rottnest dates back to 1956 when it was collected by Dr Glen Storr. There are 2 specimens in the WA Herbarium; one from UWA with no collection number but stating 'Barker Swamp 30 August' and one from shallow sand over limestone labelled 'Rottnest collection number no 178 dated 28th August'. The specimens look very similar.

In July 2016 the Perth Herbarium received a request from Heidi Meudt at the Te Papa Museum in Wellington NZ for some leaf material from the Western Australian *Myosotis* to contribute to her investigation of the systematics (genetic relationships) of southern hemisphere *Myosotis*.

In August, September and October 2016 Judith Harvey, Elizabeth Rippey and Jon

Dodd searched for *M. australis* around Barker Swamp, the largest of three fresh water swamps remaining on the Rottnest five others had been mined for marl to be used as road base. There were signs of heavy quokka grazing, numerous weeds and no sign of the *Myosotis*. Was it locally extinct?

On October 7th, during a joint floristic survey by members of the Rottnest Voluntary Guides Association (RVGA) and Wildflower Society of WA, Richard Fox (RVGA) spotted a *Myosotis* plant near the western end of Porpoise Bay; this led to a population of about 30 plants being discovered near Watson's Glade 3km south east of Barker Swamp; 60 years after the previous collection (photos inside back cover).

These were growing amongst low heath of *Acanthocarpus preissii*, *Guichenotia ledifolia*, *Rhagodia baccata* and scattered shrubs of *Acacia littorea*.

Leaves were collected from 15 individuals, stored in big teabag-like bags and sent to NZ along with a voucher. Duplicate vouchers will be lodged in the Perth Herbarium.

Another survey was carried out in Spring 2016 on Garden Island by Adrienne Markey and Kate Brown, but only a few juvenile plants were found. A seedling collected by Adrienne was grown to maturity to provide Heidi with genetic material from Garden Island.

So now having found *Myosotis* in a very different habitat from where it was first collected on Rottnest, Voluntary Guides and Wildflower Society Members will be on the lookout for new populations of this delicate native herb in the coming Spring; August to October (when the first collection was made).

Judith Harvey



An Open Garden with a difference.

It is a bit of a drive for some down the freeway, for others it might be just down the road. Nancy Scade of the Australian Native Nursery <http://www.australiannativenursery.com.au/>, 141 King Road, Oakford, WA 6121, has advised that she would be more than happy to do a guided tour of the production area as well as the surrounding gardens for our first members' only visit to an Open Garden for 2017. This will be on Saturday afternoon March 18, 2017 from 1 pm till around 4.30 pm. Many thanks Nancy (and her willing helpers) for your hospitality and sharing your garden adventure with us. And..... the retail area will be open with over 500 species in tubes available – an updated list will be on the web page prior to the event. Credit card facilities are available.

As we need to have an idea of numbers, please rsvp to the Society Office: email wildflowers@ozemail.com.au or phone 9383 7979 by Tuesday 14 March 2017.

If you would like to offer your garden in the future for this initiative, then please let the Office know. We are aiming for a geographical spread of visits.

Kerry Smith



Coates Wildlife Tours

Pilbara Reef & Ranges Expedition

15 Day Camping tour – Departs 4th April 2017

Experience Ningaloo Reef, Abrolhos Islands & Karijini National Park. Join us as we explore the wildlife of the Western Australian coast including the Abrolhos Islands, Shark Bay and the Ningaloo Reef before travelling inland to experience the spectacular Karijini National Park.

Lake Eyre Basin and Flinders Ranges Expedition

15 Day Camping Tour – Departs Adelaide 21st May 2017

This tour covers some of South Australia's most historic outback locations in the Lake Eyre Basin and the spectacular Flinders Ranges. Both regions offer vastly different examples of our great country and offer an opportunity for a wide range of arid zone flora & fauna sightings.

Alice Springs to Kununurra Expedition

14 Day Camping Tour – Departs Alice Springs 21st May 2017

This trip is packed with highlights including a Lake Argyle cruise, the Keep River National Park, Duncan Highway, Wolf Creek Crater, Lake Stretch, the Tanami Road, New Haven Sanctuary and the West MacDonnell Ranges.

Kimberley Discovery

15 Day Camping / Accom Tour – Departs Broome 29th June 2017

Enjoy a wonderful outback experience as we discover the Kimberley's wildlife, spectacular outback scenery, and many wonderfully refreshing waterholes as we explore Purnululu N.P, the many gorges of the Gibb River Rd, Home Valley and Mornington Stations.

Kimberley Wonders

12 Day Camping Tour – Departs 22nd July 2017

A different twist on the Kimberley, we include the best of the Gibb River Road but add a visit to the Mitchell Plateau. On the plateau experience the spectacular Mitchell and Mertons Falls plus great examples ancient rock art along with the regions wonderful flora and fauna.

Carnarvon Range and Lake Ballard Expedition

14 Day Camping Tour – Departs Perth 19th August 2017

The Carnarvon Range is part of a determined native title area and is currently closed to the general public. We are fortunate that the traditional owners have granted us access. There are over 400 vascular plants and 80 plus species of birdlife that have been identified in the ranges.

Contact us for our full 2017 tour program: Free Call: 1800 676 016 Web: www.coateswildlifetours.com.au • Email: coates@iinet.net.au

Events

2 Feb	Vanessa Liebenberg: Art, Textiles and WA flora	Murdoch
9 Feb	Kim Sarti and Sue Radford: Photographs and activities of 2016	Armadale
12 February	Meeting	Darling Range
14 Feb	Peter-Jon Waddell: Pastoral Sustainability	Perth
24 Feb	Greg Keighery: A Biodiversity Hotspot Gingin-Chittering Region	EHills
26 Feb	Shirley Fisher: Garden Design	South West Capes
28 Feb	Wayne Merritt: Flora & Birds of Costa Rica	Nthn Suburbs
2 March	Dawn Dickinson: Urban Green Spaces	Murdoch
9 March	AGM & Kevin Collins: Banksia Garden and National Collections	Armadale
14 March	Byron Lamont: Honeyeaters, Cockatoos, Nutritious Seeds and the Evolution of Woody Fruited Hakeas	Perth
24 March	Mike Lyons: Flora of selected Kimberley Islands	EHills
28 March	Jessica Bruce & Michael Just: Ericaceae & <i>Reedia spathacea</i>	Nthn Suburbs
2 April	AGM and General Meeting	South West Capes
11 April	Greg Keighery: All About Native Carrots (Apiaceae)	Perth
13 April	Margarte Brocx: Geoheritage	Armadale
25 April	Members' Photo Night: Where Have You Been?	Nthn Suburbs
28 April	Kirsten Tullis: Fungi Facts	EHills
6 May	Phil James: Eremophilas	South West Capes
9 May	Mark Brundrett: Biodiversity: It's all in the Dirt	Perth
11 May	Jolanda Keeble: High Vallee	Armadale
23 May	Mike Lohr: Future Weeds of WA	Nthn Suburbs
8 June	Cathy Car: Leaf Litter Critters	Armadale
27 June	Keith Oliver: Kangaroo Paws	Nthn Suburbs

Special Events/Dates

4 Feb	Honor Venning Library open 1 to 3pm Perry House and the 1st Saturday in each month till December	
8 Feb	Book Launch: 30 Years of Urban Environmental Volunteering in WA: Friends of Brixton Street Wetlands, Kenwick by Subas Dhakal at Lotteries House 6pm for 6.30pm	Urban Bushland Council
11 Feb	Society Management Committee meeting with/at Murdoch Branch 10am-12pm	Murdoch
7 March	AGM and talk by Ron Johnstone at Lotteries House 6pm for 6.30pm	Urban Bushland Council
23 March	Motions for 2017 Society AGM closing date	Office
26 March	Walk: Rapids Conservation Park	South West Capes
22 April	Plant Sale at Landsdale Farm School, Evandale Rd, Darch	Nthn Suburbs
2 May	Society Awards 2017 closing date for nominations	Office
24 June	Society AGM, State Council	Merredin

Buzz Pollinated Flowers of Western Australia

Buzz Pollination, that is vibrational pollination of normally apically dehiscent anthers with dry pollen by bees, is present in about 75 families and over 20,100 species of flowering plants (Buchmann, 1983). This comprises approximately 6-8% of the 225,000 species of flowering plants worldwide. In most cases this pollination syndrome involves female bees grasping the anthers, hunching over the terminal pores and shivering their flight muscles, causing the vibrations to be transferred to the anthers and shaking out the dry pollen onto the hairs on the bee's body (Buchmann, 1983) (photo back cover). This shivering causing an audible buzz, hence the name of this syndrome.

Buzz pollinated flowers lack nectar and are only visited by female bees that are collecting pollen for 'puddings' used to feed their larvae. Buzz flowers generally have their bright yellow anthers clumped in a cone with each anther on a long flexible filament. Often the flowers are strongly contrasting in colour between the anthers and petals, but lack notable scent or nectar, usually the petals are blue and the anthers bright yellow leading to another common name for the syndrome of *Solanum* Flowers (Anderson, F.J. and Symon, D. 1988). In WA these flowers are strictly diurnal (only lasting the single day), generally open early in the morning and close early afternoon.

Currently over 511 species of flowering plants that are morphologically adapted to be buzz pollinated are found in Western Australia (see Table 1, page 43, photos back cover). The largest number of these species, 393 in total, are found in the winter rainfall areas of the Southwest (SW), with 169 species in the arid and 87 in the tropical north. Interestingly Western Australia with about 4% of its known flowering plants buzz pollinated is comparatively low by world standards, despite having a rich native bee fauna of over 1,000 species (Houston, 2000).

While the reasons for this are unknown, it is not for lack of native flowers closely adapted to bee pollination. There are highly specialised secondary pollen presentation systems utilised by bees in the species-diverse families Goodeniaceae, Campanulaceae and Mrytaceae (*Verticordia*). Most members of the large families Fabaceae and Asteraceae have flowers adapted for bee pollination too. There are also highly specialised bee flowers in the: Proteaceae - *Conospermum* (Houston, T.F. 1989), *Persoonia* (Bernhardt, P. & Weston, P.H., 1996) and *Synaphea*; and Scrophulariaceae - *Eremophila*.

There are also many nectarless flowers that have non-poricidal anthers where observations have shown that they are buzzed by female bees, e.g. in Buchmann (1985). Observations in Western Australia show that the large genus *Hibbertia* currently with 119 species, has only one species (*H. conspicua*) that has the morphology of a typical buzzed flower (Keighery, 1991), but most species have nectarless flowers with numerous anthers. Houston (1992) notes that *Hibbertia* flowers are often buzzed by females of the bee genus *Lestis*. The addition of this large group as specialised pollen flowers (see studies by Bernhardt, 1985 & 1986) utilised by bees would substantially raise the percentage of buzz flowers, if not strictly speaking standard buzzed flowers.

Members of the genera of Hypoxidaceae (*Hypoxis* and *Curculigo*), *Billardiera* of the Pittosporaceae (three species previously placed in the genus *Sollya* – *S. fusiformis*, *S. heterophylla* and *S. drummondii*, all SW and all with blue flowers and yellow anthers) and *Cleome* also are visited and often buzzed by pollen collecting bees.

A new species of *Caesia*, *Caesia alfordii* ms, has flowers that are becoming the typical morphology of a buzzed flower but still have anthers dehiscing via slits.

There are also an amazing group of Orchids, *Elythranthera*, *Epiblema* and *Thelymitra* (Bernhart, P. and Burns-Balogh, P. 1986) where members have false anthers that mimic a buzzed flower but have no rewards for the bee; this is a case of deception and mimesis.

So perhaps the reason for the apparently lower amount of buzz pollination is that there is a very wide range of highly specialised pollination systems in our rich and diverse flora.

Greg Keighery

Further Reading

Anderson, F.J. and Symon, D. (1988). Insect foragers on *Solanum* flowers in Australia. *Annals Missouri Botanical Garden* 75: 842-852.

Bernhardt, P. (1984). The pollination biology of *Hibbertia stricta* (Dilleniaceae). *Plant Systematics and Evolution* 147: 266-277.

Bernhardt, P. (1986). Bee-pollination of *Hibbertia fasciculata* (Dilleniaceae). *Plant Systematics and Evolution*. 152: 231-241.

Bernhart, P. (1995). The floral ecology of *Dianella caerulea* var. *assera* (Phormiaceae). *Cunninghamia* 4: 1-17.

Bernhart, P. and Burns-Balogh, P. (1986). Floral Mimesis in *Thelymitra nuda* (Orchidaceae). *Plant Systematics and Evolution* 151:187-202.

Bernhardt, P. & Weston, P.H., (1996). The pollination ecology of *Persoonia* (Proteaceae) in Eastern Australia. *Teloepa* 6: 775-803 Buchmann SL (1983). Buzz pollination in angiosperms. In: CE Jones & RJ Little (Eds) *Handbook of experimental pollination biology*. Van Nostrand Reinhold, New York, pp. 73–114.

Buchmann, S.L. (1985). Bees use vibration to aid pollen collection from non-poricidal flowers. *Journal Kansas Entomological Society* 58: 517-525.

Houston, T.F. (1989). Leioproctus bees associated with Western Australian smoke bushes (*Conospermum* spp.) and their adaptations for foraging and concealment (Hymenoptera: Colletidae: Paracolletini). *Records Western Australian Museum* 14: 275-292.

Houston, T.F. (1991). Ecology and behaviour of the bee *Amegilla (Asarapoda) dawsonii* (Rayment) with notes on a related species (Hymenoptera: Anthophoridae). *Records Western Australian Museum* 15: 591-609.

Houston, T.F. (1992). Biological observations on the Australian green carpenter bees, genus *Lestis* (Hymenoptera: Anthophoridae: Xylocoprini). *Records Western Australian Museum* 15: 785-798.

Houston, T.F. (2000). Native Bees on Wildflowers in Western Australia. Special Publication No. 2, Western Australian Insect Study Group.

Houston, T.F. and Ladd, P.G. (2002). Buzz Pollination in Epacridaceae. *Australian Journal of Botany* 50: 83-91.

Houston, T.F. and Ladd, P.G. (2003). Getting a buzz out of life. *Landscape* 19(1) 27-31.

Keighery, G.J. (1991). Pollination of *Hibbertia conspicua* (Dilleniaceae). *W. Aust. Nat.* 18 : 163-165.

Table 1: Genera and Species that are Buzz Pollinated in Western Australia

Key: No. of species in genus; Distribution of species: N: Northern; E: Desert; and SW: Winter rainfall Mediterranean areas.

MONOCOTYLEDONS**ASPARAGACEAE**

Arnocrinum (3, N: 0, D: 0, SW: 3)

Arthropodium (Including

Dichopogon (8, N: 0, D: 4, SW: 8)

Hensmannia (3, N: 0, D: 0, SW: 3)

Johnsonia (5, N: 0, D: 0, SW: 5)

Sowerbaea (3, N: 1, D: 0, SW: 2)

Stawellia (2, N: 0, D: 0, SW: 2)

Thysanotus (Including Murchisonia)

(55, N: 2, D: 18, SW: 47)

COMMELINACEAE

Cartonema (6, N: 5, D: 1, SW: 5)

DASYPOGONACEAE

Calectasia (13, N: 0, D: 0, SW: 13)

HAEMODORACEAE

Phlebocarya (3, N: 0, D: 0, SW: 3)

HEMEROCALLIDACEAE

Agrostocrinum (3, N: 0, D: 0, SW: 3)

Dianella (4, N: 1, D: 2, SW: 3)

Stypandra (2, N: 0, D: 1, SW: 2)

IRIDACEAE

Orthrosanthos (3, N: 0, D: 0, SW: 3)

Patersonia (20, N: 0, D: 1, SW: 20)

XYRIDACEAE

Xyris (17, N: 6, D: 0, SW: 11)

DICOTYLEDONS**BIXACEAE**

Cochlospermum (1, N: 1, D: 0, SW: 0)

BORAGINACEAE

Halgania (21, N: 2, D: 18, SW: 15)

Trichodesma (3, N: 1, D: 3, SW: 1)

DILLENACEAE

Hibbertia conspicua (1, N: 0, D: 1, SW: 1)

ELAEOCARPACEAE

Tremandra (2, N: 0, D: 0, SW: 2)

Tetratheca (38, N: 0, D: 9, SW: 32)

Platytheca (4, N: 0, D: 0, SW: 4)

ERICACEAE

Coleanthera (3, N: 0, D: 0, SW: 3)

Conostephium (14, N: 0, D: 0,

SW: 14)

FABACEAE

Chamaecrista (6, N: 6, D: 0, SW: 0)

Labichea (11, N: 0, D: 9, SW: 7)

Petalostylis (2, N: 0, D: 2, SW: 1)

Senna (50, N: 23, D: 44, SW: 22)

LAMIACEAE

Cyanostegia (4, N: 1, D: 0, SW: 3)

Brachysola (1, N: 0, D: 0, SW: 1)

LYTHRACEAE

Lagerstroemia (1, N: 1, D: 0,

SW: 0)

MALVACEAE

Guichenotia (17, N: 0, D: 0,

SW: 17)

Keraudrinia (11, N: 4, D: 10,

SW: 6)

Lasiopetalum (47, N: 0, D: 0,

SW: 47)

Lysiosepalum (5, N: 0, D: 0, SW: 5)

Thomasia (41, N: 0, D: 0, SW: 41)

MELASTOMACEAE

Melastoma (1, N: 1, D: 0, SW: 0)

Osbeckia (1, N: 1, D: 0, SW: 0)

PITTOSPORACEAE

Cheiranthra (2, N: 0, D: 0, SW: 2)

Byblis (6, N: 4, D: 3, SW: 2)

SOLANACEAE

Solanum (62, N: 28, D: 43, SW: 15)



Quaalup Homestead 1858 Wilderness Retreat

Your perfect place to stay in the Fitzgerald River National Park

With over 1800 plant species, including some rare or endemic species like the Qualup Bell and *Hakea victoria*, abundant birdlife, famous Point Ann beach with its Southern Right Whale Nursery and the beautiful scenery of heathland and mountain ranges, this National Park is really worth a visit.

On our 40 acres of native bushland surrounded by the National Park we offer:

- cosy s/c ensuite accommodation (2 pers units, 2 bedroom chalet, 3 bedroom cabin)
- nature camping area (for caravans or tents)
- botanically signposted nature walk with stunning views
- kayak/canoe hire to explore the beautiful Gairdner River
- heritage listed Homestead from 1858, open for visitors as Guest Lounge and Cafe

The Retreat runs its own environmentally friendly solar power system.

Bookings and more information: Ph: 08 9837 4124

Website: www.whalesandwildflowers.com.au

Below: Some Rob Harington Award arrangements; and **below opposite** Roger Harington with the Rob Harington Award winning arrangement. Photos Kim Sarti





Above top - too little phosphate;
middle - just right and **bottom** - too
much phosphate. Photos J Barrow

Right: above early garden; **below**
garden 2016. Photos Alex George





BUZZ POLLINATED FLOWERS

Flowers are symmetrical with the stamens grouped or close. Pollen is held in the anther and squeezed out by the insect vibrating [buzzing] the anther or anthers (black circle). The petals and stamens have a contrasting colours.

Monocot flowers



Dicot flowers



- a) female parts style/stigma bent away from the stamens in the monocots ,
- b) male grouped stamens, ringed in other flowers.
- c) pollen grains on the petal, dropped by buzz pollinator.

