BUTTERFLY CONSERVATION SA INC.

NEWSLETTER

No. 58: May, 2016

BUILDING A NATIVE BEE HOTEL

Remko Leijs Honorary Research Associate at the South Australian Museum

Did you know that there are thousands of native bee species? And many are yet to be discovered… some might visit your garden!

If you imagine what a bee looks like, you're probably thinking about a European honey bee. As the "European" reference in the common name suggests, these bees did not occur in Australia until they were introduced for honey production almost 200 years ago. Having established themselves away from the beekeepers' hives, European honey bees are now feral in Australia, often building hives in tree hollows. These feral bees are important crop pollinators. But, on the down-side, they out-compete native animals such as birds and mammals for nesting hollows, and occasionally also for pollen and nectar.

There are many other bee species in Australia, that are native to this continent, and many of them could visit your garden. In fact, there are about 1,650 species of native bees known for Australia and 20,000 bee species known worldwide. But we haven't stopped counting yet, and scientists are regularly discovering new species of bees. Among native bee species there is large variation in shape, size, coloration, nesting habits, behaviour and flower preferences. For example, the largest species (a carpenter bee) is just less than 25 mm long, while the smallest species are more than ten times smaller, at about 2 mm long.

Native bees are quite different to honey bees. The European honey bee is highly social, with hives having a queen and several thousand workers. In contrast, most native bees are solitary and nest alone. A single female bee builds a small nest and then does all of the tasks that are necessary to support new offspring.

Native bees use a variety of nesting places. About half of the Australian bee species dig their nests in the ground. Sometimes hundreds of solitary females may communally share a single nest entrance (just like people do in a large apartment building), but build their own nesting tunnels inside. The other half of the species use natural hollows, such as rock crevices, old borer's holes in wood, or even keyholes. They can also excavate their own tunnels in soft timber or pithy stems of plants.

Within a nesting tunnel, a female native bee will construct a "brood cell". She then collects enough pollen to knead it into a pollen ball, deposits an egg on it, and closes the brood cell. She can make several brood cells sequentially in one nesting tunnel. After a few days a bee larva emerges from the egg in the brood cell and starts eating the pollen ball. When all the pollen is eaten the mature larva turns into a pupa. By that time the mother bee has usually died. The bee then hibernates in the brood cell until it is time to emerge in the warmer months. After emerging males and females mate and the whole cycle starts over again.

There is often a shortage of suitable nesting places and building materials, so native bees will readily take up "artificial" housing if you provide it. Such housing

Continued page 2.

IN THIS ISSUE

Blue-banded bees (*Amegilla asserta*), these native bees make a substantial contribution to the pollination of tomatoes and can be seen in Adelaide gardens. Photo courtesy of Remko Leijs

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is commonly called a bee hotel. It is easy to make a bee hotel, by drilling holes in a piece of timber or by providing suitable tubes for native bees to nest in. For example, bamboo sticks can be used. Bamboo should be cut into short lengths, just behind the nodes, so that there is only a hole at one end. Or a bundle of paper straws in a tube can be used. The straws can be bundled in a piece of drainpipe or in an empty drinking bottle.

Why not build a bee hotel and learn more about the many visitors to your garden?

There is a useful information sheet on building bee hotels online. If your click on Remko's original article on 'Discovery Circle' http://www.discoverycircle.org.au/building-a-native-bee-hotel/ You can go directly to different links. You can report sightings of native bees and have them identified through Bowerbird. Or watch a short video about native bee hotels in a garden in New South Wales at the ABC website.

The scientific name for the European honey bee is *Apis mellifera*. There has been some media recently about the decline of these bees worldwide. This is a concern in Australia, which reinforces the importance of other pollinating species (like native bees).

Safety is important if you are observing native bees. Although native bee stings are uncommon, and I have not heard of anyone having an allergic reaction to a native bee sting, it is possible that they could cause an allergic reaction. Therefore, it is important that you are cautious in observing native bees and that you do not touch native bees.

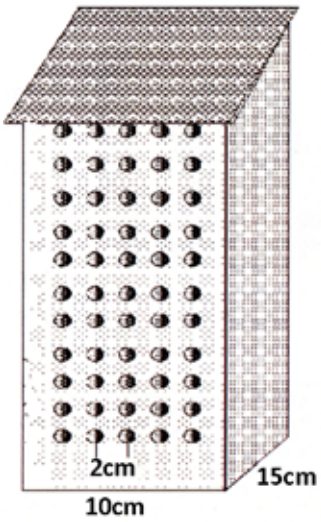
Most importantly, seek medical attention if you have a reaction to the sting of any bee. Native bees are not as likely to sting people as European honey bees, as they have very different social behaviours and physiologies. European honey bees are social animals and aggressively defend their colonies. In contrast, most native bees are solitary and are not aggressive.

In terms of physiology, European honey bees sting with a barb that continues to inject venom once it has been delivered, whereas native bees do not. There are about ten species of native bees that are social, but they are stingless.

BUZZ POLLINATION - PLANTS - *Remko Leijs*

The following plants are pollinated more efficiently by buzz pollination: All *Dodecatheon* (shooting stars). Many members of the Solanaceae family (nightshades), including many species of the genus *Solanum*: (eggplants, potatoes, tomatoes), *Solanum cinereum* (an Australian shrub).

Other genera include: *Hibbertia*, (Guinea flowers) *Dianella* (flax lilies), plus other lillies including fringe, chocolate and bulbine, *Lasiopetalum* (velvet bushes), nearly all Orchids, *Acacia*, *Senna* and *Tetratheca*. Some of these plants however do have extra floral nectaries.



Measurements for a bee block and some bee hotels.Top and below at Eden Hills; third row, at Sophie's Patch Mt.Barker. Photos: Jan Forrest. Above: an elaborate bee hotel Photo: courtesy Remko Leijs.

WHAT YOU CAN DO TO ATTRACT NATIVE BEES TO YOUR GARDEN

Author: Katja Hogendoorn

1. Cut back on the mulch
Gardeners love mulch, and it does have its benefits. However half of our native bees dig nests in the soil, and a layer of mulch will discourage them from taking up residence in your garden. Leave a few suitable areas (see under 4) free of mulch for the bees.

2. **Minimise your use of weed barriers**
Barriers of black plastic or landscape fabric may be an easy solution for keeping the garden weed free. However, bees can't tear through thee barriers to reach the soil surface, so rethink your weeding strategy. If you must use a barrier, try laying down newspapers instead – they will biodegrade over time.

3. Plant a range of native plants that flower from early spring to late autumn.
Native bees prefer native plants, but they won't wait around until your garden is in flower. Bees need pollen and nectar to live, and if they can't find flowers in your garden, they won't settle in. Furrow bees begin foraging as soon as spring arrives, while resin bees and leafcutter bees often become active in summer. Plant a variety of locally native plants that provide flowers from early spring to late autumn, and you will keep native bees happy all year. Yellow and blue are bee colours by eminence. Eucalypts, hakeas, peas and eremophila are very attractive.

4. Plant buzz pollinated plant.
Honeybees cannot use buzz pollinated plants, so by providing them, you provide an edge for native bees. *Senna*, fringe, flax and chocolate lillies, *Hibbertia*, Solanums (including tomatoes) and *Lasiopetalum* are all buzz pollinated. Make sure there are nectar producing plants close by such as *Scaevola*, blue flowering Eremophilas, Christmas Bush, *Boobialla* are all good (adult butterflies feed on nectar producing plants).

5. Leave some areas of your garden free of vegetation.
Many native bees nest in the ground and these bees usually seek out slightly compacted soils. Not too dry, not too wet, with at most light traffic, that is free from vegetation. Yes they are picky! Look for existing nests, and leave or make a few patches of bare soil around so they can burrow, and they won't have far to travel to pollinate your flowers. Remember, ground nesting bees like morning sun and afternoon shade.

6. Plant plants with pithy vines or canes.
Dwarf carpenter bees, which grow to just 8mm, spend their winters nestled inside hollowed out canes or vines. Come spring, the females expand their pithy burrows and lay eggs. When pruning dead branches with pithy centres, leave a stretch of 10cm or more above the node to allow bees to construct a nest.

7. Limit pesticide use.
Chemical pesticides, particularly broad spectrum pesticides, can negatively impact native bee populations. Use pesticides conservatively, or better still, not at all. By doing so, you will also encourage beneficial predators to stick around and feed on your insect pests. For aphids on trees, try using sticky stuff on the trunk to remove the access by ants. This will allow beneficial predators and parasitic wasps to get the problem under control!

8. Leave dead wood for wood nesting bees.
Resin bees often use old beetle bores in dead wood in which to nest.

9. Don't mow your lawn so often.
Many weeds in lawns provide good sources of nectar and pollen. Mowing trims these flowers. Try to let your lawn grow a little longer before you mow.

10. Install some artificial nests for resin, masked and leafcutter bees.
Resin, masked and leafcutter bees make tube-shaped burrows, in which they lay their eggs. These bees don't usually excavate their own burrows, preferring to find existing cavities and build within them. Fill a tin with a bundle of waxed paper drinking straws, mount it to a fence post in a shaded area, as an artificial nest. You can also drill holes in a block of wood, or poke holes in drying clay.

WHAT IS BUZZ POLLINATION?

www.yates.com.au › **Healthy Gardens need Healthy Bees**

Buzz pollination is the term used when insect pollinators have to literally shake the pollen out of a flower. In certain plants the pollen is held within tight tubes. Occasionally wind will create enough disturbance to loosen some of the pollen from these tubes, but the job is done much more efficiently by flying insects that grab the pollen-bearing part of the flower with their mouths (mandibles) and hold on firmly while, at the same time, contracting their flight muscles hundreds of times per second, all without moving their wings. This strong vibration releases the pollen which then lands on the flower's own female parts or is carried away to another flower by the pollinating insects.

Which plants are buzz pollinated?

About 8 percent of the world's flowering plants (more than 20,000 species) must have their pollen released in this manner. The list includes many Australian native plants such as solanum, hibbertia and dianella species. And, importantly for gardeners, common edible plants such as eggplant, tomatoes, potatoes, chillis, blueberries, cranberries and kiwifruit also fall into this category.

Which insects can carry out buzz pollination?
Interestingly, the common honey bee can't buzz pollinate (so, while it's important to encourage honey bees into your garden, they won't help your tomatoes to set fruit). Bumble bees, which are present in New Zealand and Tasmania, are effective buzz pollinators. In Australia tomatoes growing in glasshouses are often pollinated by hand-operated mechanical vibrators, a method which is effective but costly. There has been some pressure from Australian glasshouse tomato growers to allow the introduction of bumble bees into the mainland to pollinate their crops, but so far the authorities have resisted. Certain Australian native bees – such as blue banded bees, carpenter bees and teddy bear bees - are very good buzz pollinators and breeding these in commercial numbers could well be the answer to the glasshouse growers' problems. http://australianmuseum.net.au/movie/Buzz-pollination.

You can encourage native bees by growing native plants and leaving some wild sections in your garden where they can breed and feed (many nest in the ground).

FRIENDS OF PARKS 30th FORUM
14-16 October, 2016

Theme: Urban Biodiversity Rocks!
Venue: The Cove Civic Centre,
1 Ragamuffin Dr, Hallett Cove
Cost will be approximately $125.00 to attend all sessions and enjoy all meals - part sessions may be available.

Program commences from 4.00pm Friday night,
guest speaker Terry Reardon - Bats.
Saturday 15th commences 9.00am
speakers and panel
afternoon guided tours which may include Hallett Cove, Marino, Field River and O'Halloran Hill.
formal diner and awards (Marion Sports Club)
Sunday 16th commences 9.00am
Biodiversity panel
Historic buildings panel
close followed by lunch
1 - 4pm guided tours may include Hallett Cove, Marino, Glenthorne Farm, O'Halloran Hill, Worthing Mine.

If you would like to attend the 30th Friends of Parks Forum at The Cove Civic Centre 14th - 16th October, 2016 please register your interest with Secretary Jan Forrest and registration forms will be forwarded to you when they become available. See last page for Jan's contact details.

WHAT'S FOR SALE?

BOOKS ***"Attracting butterflies to your garden, what to grow and conserve in the Adelaide Region"***
NEW EDITION Published by BCSA 2016 - Our price $25 (**new** members may purchase one book for $20). Postage $10.

DVD ***"Butterfly Garden"*** produced by Tracy Baron and Carolyn Herbert - BCSA members price $15, postage and packaging $10 One book plus one DVD postage $15.

POSTERS ***"Spiders and their allies of the Adelaide Region"*** Published by BCSA 2014. $10 a set of two, plus postage.
The posters ***"Common Moths of the Adelaide Region"*** **are now out of print.**
Single posters: Bats of SE South Australia and The Bilby - Endangered Species are available for $5 each, plus postage.
Poster postage is $12 for up to 6 posters.

SITE SIGNS: Application form to register a butterfly site available on the butterfly gardening website. Cost including postage $50.

PLANT TAGS: See list and form available on website. $2.00 per tag, includes plastic stake.

POLO-SHIRTS with Butterfly Conservation logo. NEW PRICE LIST AVAILABLE Prices between $35 and $40 depending on size and style. A wide range of colours are available.

If you would like to order any of our merchandise, obtain an order form for a site sign, plant tags, polo-shirt or schools poster set, please email: info@butterflygardening.net.au or write to the Secretary C/- SAMuseum, North Terrace, ADELAIDE. 5000.

PAPERED COLLECTION OF BUTTERFLIES AVAILABLE FOR SALE

We have recently become aware of a collection of around 400 papered butterflies collected in the late 1960's in the Himalayan foothills. They are prepared and catalogued and preserved with chloro chresol in sealed containers. Some species are listed as rare. A duplicate set was dontated to the SAMuseum at the time of importation. As well, there are also some PNG birdwing butterflies. If you are interested please make direct contact with george.duffy@bigpond.com.

MELDANDA CAMPSITE BUTTERFLY GARDEN- CAMBRAI

Committee member Gil Hollamby has been chasing up the status of gardens which have bought and erected BCSA 'Butterfly Site' signs. One such garden is that of the Cambrai Area School. The school was bequeathed some land by a local sheep farmer to be developed for the benefit of young people.

Part of it is now a campsite focussing on environmental, aboriginal and outdoor education.

Three gardens have been established.

- Native Bush Garden containing each of the plant vegetation types native to the Murray Plains.
- Bush Tucker Garden planted with a broad range of plants used by indigenous people for food and medicine.
- Butterfly Garden of native plant species which attract and are caterpillar food plants for local butterflies. A garden of fire retardant plants is in the making.

Gil visited this garden in October last year in the middle of our hot dry Spring and gave a talk on butterflies to a group of students from the school involved in the gardens. Sally Gethin-Jones looks after the area with maintenance etc. and Aimee Linke is the Project Officer of Mid Murray Landcare formerly Mid Murray LAP. They have established the garden according to the principles espoused in BCSA book 'Attracting Butterflies to Your Garden'.

The garden is well worth a visit to see how it has been established and how it is being integrated into all aspects of teaching from nature studies through to art classes. www.cambrai.sa.edu.au/melanda.htm.

Last copies of our original Butterfly Gardening book have just been sold and the NEW EDITION is now available. If you have a butterfly site sign or have a butterfly garden and would like to purchase a sign or would like some advice on establishing a butterfly garden please contact the committee c/- Secretary Jan Forrest, as we have some very cluey folk willing to assist you.

Thanks Gil for the photos and information.

Top right Sally Gethin-Jones next to the butterfly watering hole (also home to a red-bellied black snake) note the butterfly site sign; entrance to the butterfly garden; 'the garden'; butterflies of Meldanda sign; mosaic butterfly and special 'butterfly plant' signs which provide information on the genus, species and common name. Photos: Gil Hollamby.

RAISING BUTTERFLIES

Mike Moore

As a Lepidopterist one of the activities that you end engaging in is the raising of butterflies and moths at home.

There are probably three reasons for doing this –

- You can learn more about the habits and life cycle of the insect in question
- You can raise perfect specimens for your collection
- The fact that taking eggs or young caterpillars from the wild is less damaging to the population than taking adults.

What happens is that you end up with a whole host of plants in pots just on the off chance that you will collect an egg or caterpillar.

Most butterflies can be raised in jars and I will be talking more about that in a moment. Skippers however, have a long life cycle and as most of it is spent as a caterpillar, they are more difficult to rear.

RAISING BUTTERFLIES IN JARS
The technique is very simple.

Collect a Screw Top Jar.
I find appropriate coffee jars, vegemite jars and pasta sauce bottles good to use. The latter have the advantage of being square and hence do not roll when placed on their side.
I do not use pressure seal jars. Caterpillars are hydrostatic organisms (full of fluid) and could be affected by the pressure changes in opening and shutting the sealing lid.

Some collectors do not like using plastic containers. I have not had any problems with plastic containers but then again I invariably use glass containers anyway. Some plastics release hormone like chemicals and these may upset the caterpillars' development.

When hatching caterpillars from eggs I usually start with a small jar. Using a small jar has pluses and minuses. On the plus side is that because you only put a small amount of plant material in the jar you can find the tiny caterpillar when it comes time to clean the jar and/ or replace the food. On the minus side however, because you only have a small amount of plant material in the jar it tends to dry out quickly meaning more regular replacement. This regular replacement is critical during the time the egg is developing and no caterpillar is present so that when the egg hatches the hatchling has something good to eat.

I usually lay my jars on their side

The Paper Bed
Cut a piece of paper to lie flat in the jar. I usually use kitchen paper towel but toilet paper will do.
Cut it to fit. (I usually cut it slightly undersize)
If it is too big it provides enticing nooks and crannies for caterpillars to crawl into meaning that at cleaning time they might be damaged by unsuspected rough handling.

The paper is valuable for the following reasons.

- Moist plants can transpire in the jar forming a water film. The paper absorbs much of this meaning the caterpillar is less likely to become trapped in liquid.
- Most of the caterpillar poo (frass) ends up on the paper meaning that it can easily be cleaned off and the paper re-used.
- Any liquid released by the caterpillar or emerged adult can be absorbed by the paper and not be available to trap the insect larva or adult.

When cleaning the jar or replacing the food you can carefully grab the paper with tweezers and pull everything out more easily. When doing this CARE must be taken. Many caterpillars love to hide under the paper meaning that careless handling again could damage them. I always look under the paper from outside of the jar before I remove it to make sure I know where the caterpillars are or are not located.

A Piece of Bark
If the butterfly species lives on or near the bark of tree or shrub I always make sure I put a piece of bark in the jar.

- Many butterflies hide during the day on or under bark and doing this makes them feel more secure.
- Caterpillars when they ecdyse (shed their skin) need a firm base to grasp on to and the bark provides this.

Food
Remember butterflies have very specific food requirements and so you must have the correct food on hand. Some butterflies can be transferred onto other food plants but this is usually the exception rather than the rule.
If at all possible what ever plant species they were collected on I try to maintain them on.

For young caterpillars I try to provide young shoots. Many plants have within them toxins to stop animals predating upon them. Young leaves have less toxins and are probably more palatable for smaller caterpillars.

Provide enough food so that moisture levels in the jar are sufficient to keep all of the plant material moist. Caterpillars cannot eat dry leaves.

Extra Moisture
This can be provided by placing a wet but squeezed wad of absorbent paper or cotton wool in the jar. If I do this and I only do it irregularly I trap the wad in the lid. Remember caterpillars do not handle wetness at all well so you do not want liquid water free in your breeding chamber.

OTHER TECHNIQUES

Replacing The Food.
Ideally this would be done every second or third day.

Cleaning The Jars
Some people clean the jars, ie wash and dry them regularly. I do not usually do this. I find that as long as the frass is cleaned out completely each time you add new food you

do not need to clean the jars. If however the frass starts to go mouldy (usually through too infrequent cleaning) then you will need to clean the jars thoroughly.

Positioning
Ideally the jars should placed in a location where they can be easily and regularly accessed by you. They must not ever be in direct sunlight but placed in a location where the natural rhythms of light and dark are present. Unless you have a dedicated study that you regularly use or such, this is difficult to achieve in a household.

I have taken to placing a tea towel over the jars, keeping them permanently shaded but still able to detect the normal diurnal cycles.

Handling The Caterpillars.
Caterpillars are rather fragile so try to avoid touching, or prodding or poking the caterpillars. If you feel you need to clean them or move them along use a paint brush to very gently brush away what is annoying you or them. That is why you need to be careful locating them before you add new food. If when maintaining the jars the caterpillars are located on the food I cut the leaf or twig or piece of paper bedding off the old plant or bed and place it back in the jar and add new food around it.

When shedding their skin caterpillars will often sit motionless for days. It is imperative that they are not disturbed during this time, so cut off the substrate (leaf, twig or occasionally paper bedding) and place it carefully back in the jar after maintenance. If they are ecdysing on the bark all the better.

How Many Caterpillars?
Firstly the smaller the jar the fewer the caterpillars. The larger the caterpillars the larger the jar! Some Lycaenid (Blues) species can be carnivorous, but in my experience that has related to the amount of fresh food available. Perhaps in a medium sized Vegemite jar two small caterpillars. Pasta sauce three small, two larger?

Keeping the numbers down in the jar also helps if any of them have/get diseased. If a caterpillar becomes diseased it inevitably dies, and will probably take any others in the jar with it. If this happens makes sure you do not transfer the disease to the other caterpillars.

Pupation
It is always a relief when the caterpillars pupate. Although disaster can still strike the task of feeding them and cleaning them is over. Clean out the jar. Make sure you have a paper bed in place. Position the pupae such that it is easy for the adults to emerge. Some species produce hanging pupae (often on the lid) and these need to be placed in a larger space. When the adults emerge they are going to need to have enough room to pump up their wings so pupation might be a good time to change the jar to a larger one. A small aquarium or a hatching chamber?
DO NOT TOUCH THE PUPA.

In the past I have also

- Taken off lid and covered the opening with choule secured by an elastic band. I do this to let the pupa dry off and to aid the drying off of the butterflies wings.
- Tipped the jar upright (Circle of paper in the bottom!) and placed a climbing stick in there too.

Problems
The only problems I have encountered is to do is usually with the nature of the food plant.

Wanderer butterflies use Milkweed as their food plant. This plant has a sticky white sap which seems to exude non-stop from the cut end of the branches. If this is placed in a jar the jar become sticky with the sap, the caterpillars also produce vast amounts of poo and the whole jar becomes a putrid sticky mass in which the caterpillars can become stuck. This is one of those species where it is better to place a cut stem in water make sure to cover the top of the vase or jar with paper, and pierce through it with the plant cutting, otherwise the caterpillars will inevitably fall into the water. Because the butterflies are exposed be very careful with any sprays used around the house. Fly spray also kills caterpillars.

Placing a plant piece in water can prolong its longevity but of course you can't do that in jars. My friend Lindsay Hunt used to use this technique for Candalides species that live on a thin soft climbing parasitic plant called Dodder.

The nettles that Australian Admirals use also present their own problems. As they die off they contract and dry whilst the caterpillar is trying to make a shelter out of silk and cut leaf. All this can make quite a mess in the jar particularly if the caterpillars are small. What I have done in the past is to let the eggs hatch on the plant in the garden and collected caterpillars when they are larger and easier to see and manage.

This was, I thought, to be a short piece but have got quite carried away. I hope you have enjoyed reading it and enthused to try. All you need are eggs or caterpillars.

The Cabbage White butterflies are a good species to begin with.

Photos: Mike Moore

www.butterflygardening.net.au

Butterfly Conservation South Australia Inc.

presents

a PUBLIC TALKS PROGRAM

On the first Tuesday of the month March to November at 6.15pm for a prompt 6.30pm start.

At the Clarence Park Community Centre
72-74 East Avenue, Black Forest.

Bus route W91/W90: stop 10.
Noarlunga Train service: Clarence Park Station.
Glenelg Tram: Forestville stop 4, 9min walk south.

Entry by donation (minimum of $2).

Bookings not required

Please bring supper to share, tea/coffee will be supplied.

Meetings should conclude by 8.30pm.

At the start of each meeting a ten minute presentation on a *'Butterfly of the Month'* will be given by a BCSA committee member.

Photo Roger Grund: Striped Xenica *Oreixenica kershawi*

BUTTERFLY CONSERVATION SA INC.
c/- South Australian Museum, North Terrace, ADELAIDE
Further Information Secretary: Jan Forrest 8297 8230
Membership is $20pa for a posted newsletter with a reduction of 50% for an emailed newsletter to $10pa. Life Membership $200

Websites:
Butterfly Gardening - www.butterflygardening.net.au

Resources for sale:
Our book ***'Attracting butterflies to your garden, what to grow and conserve in the Adelaide region'*** RRP $29.95 (at the talks program - $25ea).
'Butterfly Gardening' DVD, Plant Tags, Moth and Spider Poster sets.

PUBLIC TALKS PROGRAM 2016

7th June: ***Fishes of the Coorong: Research and informing management.*** Chris Bice, a fish ecologist from SARDI will provide an overview of the ecology of fishes of the Coorong with a particular focus on recent research and how it is supporting their management.

5th July: ***Jessie L. Hussey of Port Elliot*** had a passion for botany and during the 1890's made a significant contribution to the knowledge of South Australian vascular plants and marine algae. Presented by Lisa Waters from the State Herbarium of SA.

2nd August: 6.30pm BCSA AGM **7.00pm Public Talk**
The revegetation of a farm block on Hindmarsh Island. The work carried out by member Karen Lane on Hindmarsh Island has been an inspiration. Karen will discuss her methods and show how, in just a few years the area has been completely transformed.

6th September: ***Native grasses.*** Greg Kirby from the Native Grasses Resources Group will talk about the NGRG and its activities and what native grasses to grow in Adelaide gardens.

4th October: ***Eucalypts.*** Of the 900 odd species of eucalypts in Australia, over half are smaller mallee or shrubby species, suitable for growing in gardens. Their remarkable diversity in size, form, bark, foliage and flowers is showcased. Dean Nicolle will discuss some of the favourite species grown in gardens as well as some exciting lesser-known species that should be planted more.

1st November: ***QUIZ NIGHT.*** Come along to round off the year with general knowledge and natural history questions by our quiz master David Keane who will lead us on a journey of discovery and fun. Either form a team of six with friends, or join with others on the night. Bring supper to share. Bookings not required.

In the case of an advertised speaker not being available, a speaker of similar interest will replace that advertised.

Butterfly Conservation South Australia Inc. Butterfly Gardening Butterfly Site

BUTTERFLY BOOK REPRINT

The NEW edition of our book ***"Attracting Butterflies to your garden, what to grow and conserve in the Adelaide Region"*** **IS NOW AVAILABLE**. Order your copy now for the **special ONE-OFF members price of $20 per copy** contact publications@butterflygardening.net.au**.**

The aim of the committee is to take every opportunity to sell the book.

THIS IS WHERE MEMBERS CAN HELP!

Is there an outlet near you who may be willing to sell our book? A book shop, newsagent, chemist, post office, gift shop? If so, would you be prepared to approach them to see if they would sell our book and then take responsibility for ensuring their stocks are maintained, the account is paid etc.

If you are prepared to take responsibility for an outlet please contact Gerry Butler phone 0407 972 149 or write to him C/- The South Australian Museum, North Terrace, ADELAIDE 5000
or via email: publications@butterflygardening.net.au.

HIGHCROFT OPEN GARDEN
12 - 14 March, 2016

Gil Hollamby

BCSA mounted a display and gave talks to introduce garden visitors to thinking about gardening for butterflies. These were set up and presented in the shearing shed on the property of Chris and Maureen Highet. The talks were well attended, 35 on Saturday and 60+ on Sunday, and 5 new members were recruited.

The garden is in the rocky country near Harrogate, East of and in the rain shadow of the main range near Woodside. Water for the garden ran out over two months previously and before 25mm of rain which fell a few days before the open days it looked very stressed. For visitors it was an ideal opportunity to note which species of plants, mostly of Mediterranean of South African origin could survive such dry and heat.

On Sunday I arrived early and because everything was left set up from the previous day I had time to wander through the garden in the cool air, some dew was still on the ground.

In a few minutes I had observed eight species of butterfly, viz. Wanderer (numerous), Two Spotted Line Blue (many), Common Grass Blue (several), Southern Grass Dart (two) and single individuals of Meadow Argus, Lesser Wanderer, Australian Painted Lady and a Cabbage White.

The surrounding countryside was still looking parched so these insects had found the garden a green oasis and stayed to sip nectar from a surprising number of plants still 'flourishing' in the harsh conditions such as sedums, daisies, lantana and many others.

There were, however, there were very few butterfly caterpillar food plants which is the key to sustaining butterfly populations.

Top right: Wanderer getting his fill of nectar in the early morning.
Right: Garden visitors. Above: Southern Grass Dart.
Photos: Gil Hollamby

BUTTERFLY CONSERVATION UK REPORT

A study released Nov. 2015 has found evidence linking the use of pesticides with declines of butterflies and moths in the UK.

In light of this shocking revelation Butterfly Conservation is asking for your help to carry out more detailed analysis to find specific proof that these chemicals are responsible so we can persuade the Government to review their use.

The study, by Stirling University in association with Butterfly Conservation, looked particularly at Neonicotinoids (Neonics). These were introduced in the mid -1990's and are widely used on crops and also sold for use in gardens.

Why are Neonics such a problem?

They are a new type of highly toxic chemical which acts as a nerve agent for insects.
They stay in the environment and reach all parts of the treated crop including surrounding soil.
They get into water courses and adjacent habitats such as field margins and hedgerows where many insects breed.
They spread into pollen and nectar in wildflower strips specifically sown to help butterflies.

In the USA there is strong evidence that these pesticides are killing Monarch butterflies because Neonic residues are getting into milkweed plants that grow around arable crops. **The same phenomenon could be happening here in Britain – we must find out and stop it continuing!**

Your donation will help us find out more about this threat to the survival of our butterflies.

http://butterfly-conservation.org/

ARTICLE TEN

Aussie Bee Online
Article 10
September 2006

BLUE BANDED BEE POLLINATION TRIALS AT ADELAIDE UNI

by Dr Anne Dollin
Australian Native Bee Research Centre
September 2006

DR Katja Hogendoorn and her team at the University of Adelaide have shown that blue banded bees could be a great alternative to European bumblebees for the Australian greenhouse tomato industry.

Building on research by Melissa Bell in 2002/2003 at the University of Western Sydney (see *Aussie Bee Online* Article 9), Katja Hogendoorn has lead a three year research program on breeding and using blue banded bees (*Amegilla chlorocyanea*) for greenhouse tomato pollination.

Growing Tomatoes Inside Greenhouses

Most tomatoes are grown outdoors in Australia. However, it is becoming increasingly popular to grow tomatoes inside enclosed greenhouses. Better quality tomatoes can be produced in greenhouses, using much less water and pesticides. The annual production of the Australian hydroponic tomato industry is currently worth about Aust$90 million.

One key drawback is that the flowers of tomato plants grown inside greenhouses must be manually pollinated. Tomato flowers need a special type of pollination called *buzz pollination*. The pollen of the tomato flower is trapped inside little capsules and the flower must be vibrated to release the pollen. Some bees can perform this trick by 'buzzing' the flower with their strong flight muscles. Commercial honeybees (*Apis*) cannot perform buzz pollination but other bees such as Australian blue banded bees and the European bumblebee are buzz pollination specialists.

A blue banded bee buzz pollinating a tomato flower. Photo courtesy of Katja Hogendoorn.

There are no European bumblebees at present on the Australian mainland, so our greenhouse tomato growers must use an electric vibration wand tool to pollinate their tomato flowers. This manual pollination is expensive, costing about Aust$16,000 per hectare per year.

Bumblebees or Blue Banded Bees?

The introduction of European bumblebees to the Australian mainland is opposed by scientists concerned about the impact these exotic bees could have on our native fauna and flora. European bumblebees may also help spread exotic weeds in our farmland (more details). So Katja and her team have been researching the possible use of native blue banded bees as an alternative to European bumblebees for the greenhouse tomato industry.

In a three year research program, the team has developed protocols for breeding blue banded bees, year round, in large numbers and has developed

nectar feeders and transportable nests for the bees. Furthermore, the team has demonstrated the excellence of Australian blue banded bees as pollinators of greenhouse tomatoes.

The Blue Banded Bee Pollination Experiments

The researchers raised their experimental crops of tomatoes inside a 28m^2 greenhouse compartment with glass windows. There were 12 - 20 actively foraging female blue banded bees in the compartment, with mud brick nest blocks and feeders containing a 50% solution of *Apis* honey.

Three different experiments were run with varying treatments given to each tomato flower:

EXPERIMENT 1
A single buzz from a blue banded bee
compared with
A single vibration treatment from an electric vibration wand

EXPERIMENT 2
One to two buzzes from blue banded bees
compared with
Three to six buzzes from blue banded bees

EXPERIMENT 3
Unlimited buzzes from blue banded bees
compared with
Wand pollination treatment
compared with
No pollination treatment

Pollination Results

Experiment 1: Flowers given a single buzz by a blue banded bee produced tomatoes that were 10.9% heavier than those vibrated with the electric wand. The blue banded bee pollinated tomatoes also had significantly more seeds than the wand pollinated tomatoes.

Experiment 2: Flowers given multiple buzzes by the blue banded bees produced tomatoes that were 11.2% heavier than those given only one or two buzzes.

Experiment 3: On average the flowers that were pollinated by the blue banded bees produced tomatoes that were 24% heavier than those pollinated with the electric wand. And the flowers that were wand pollinated produced tomatoes that were significantly heavier those that received no pollination.

As Good as Bumblebees

Overall, compared with the electric vibration wand method that is commonly used in Australian greenhouses today, these native blue banded bees were able to improve the tomato yield by 20 to 24%! This result is similar to the benefit of using European bumblebees to pollinate greenhouse tomatoes: reported increases in tomato yield with bumblebees in overseas studies range from 18.4% to 28.5%.

Blue banded bees are common Australian native bee species that are widespread on the Australian mainland. They are also potential buzz pollinators of eggplant and sweet pepper crops. Given the environmental risks that would come from importing European bumblebees to the Australian mainland, the further development of our native blue banded bees would be a highly worthwhile investment for the future of Australian agriculture!

The Research Team

This research program has been conducted by the following scientists and students:

- Prof M Sedgley, Dr M Keller, Dr K Hogendoorn and S Coventry, University of Adelaide;
- Dr M Perkins and R Cox, Flinders University of SA; and
- Prof C Gross, University of New England.

Five greenhouse tomato industry partners were also involved in the program:

- International Hydroponics (Salisbury SA)
- Flavorite (Warragul VIC)
- P'Petual (Virginia SA)
- Virginia Horticulture Centre (SA)
- Biological Services (Loxton SA)

The program was funded by the Australian Research Council.

Aussie Bee Online

Article 10
September 2006

Top: Tomato plants being grown for the pollination trials. Above: Mud brick nest blocks for the blue banded bees. Photos courtesy of Katja Hogendoorn.

The full details of this important pollination study have been published in the following scientific paper:

K Hogendoorn, CL Gross, M Sedgley and MA Keller (2006) Increased tomato yield through pollination by native Australian *Amegilla chlorocyanea* (Hymenoptera: Anthophoridae). *Journal of Economic Entomology* 99(3), 828-833.

For more information on the Adelaide blue banded bee project, contact Katja Hogendoorn:
Phone: 08 8303 6555; Email: katja.hogendoorn@adelaide.edu.au

YES, PHOTOS ARE STILL REQUIRED

Preparation of the proposed moth book is progressing. Jan Forrest and Peter McQuillan got together in Hobart for a few days before Easter and went through all the text and available images.

Roger Grund continues to provide stunning images from his vast collection and we are presently seeing further images mainly of common caterpillars.

So, if you have some images of adult moths, caterpillars, leaf or other shelters, damage caused by caterpillars pupae or cocoons please make them available, even if you do not have an identification.

Contact Secretary Jan Forrest.

BANKING DETAILS

BCSA has changed its bank to enable electronic signatories.
Below are the new details for any future payments for books, posters, membership etc.

Cheque or Money Order : Please make cheques payable to: Butterfly Conservation SA Inc.
Mail your details with payment to: Treasurer, Butterfly Conservation SA Inc., C/- 12 George St, Hawthorn SA 5062.

Direct Debit : Bank: Bendigo Bank, BSB: 633-000, Account No: 152785838, Account Name: Butterfly Conservation SA Inc.If using this method please put your name in the description and email the treasurer, John Wilson, to advise payment at treasurer@butterflygardening.net.au.

BUTTERFLY CONSERVATION SA Inc.

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email < secretary@butterflygardening.net.au>
Treasurer and membership officer: John Wilson treasurer@butterflygardening.net.au
Committee: Andrew Lines; Gerry Butler (Publications Project Manager - publications@butterflygardening.net.au), David Keane, Gil Hollamby, Lorraine Woodcock, Bernadette Johnson, Linda Shmith and Bryan Harwood (endangered species advocate).
Consultants: Roger Grund and Peter McQuillan
Public Officer: Beth Keane

DIARY DATES

COMMITTEE MEETINGS - Meetings are normally held bi-monthly (usually the second Monday of the month) at 6.00pm at a committee member's home. All members are welcome to attend. If you would like to attend please contact Secretary, Jan Forrest.

PUBLIC TALKS PROGRAM 2016: first Tuesday March - November, Clarence Park Community Centre 6.15pm for a 6.30pm start to 8.30pm.
Next talk: 7th June: ***Fishes of the Coorong: Research and informing management.*** Chris Bice, a fish ecologist from SARDI will provide an overview of the ecology of fishes of the Coorong with a particular focus on recent research and how it is supporting their management.

WEB SITES

Butterfly Gardening - www.butterflygardening.net.au
South Australian Butterflies (R Grund private site) - http://www.sabutterflies.org.au (has been off-line however Roger assures us that it will be back on-line very soon)
NRM Education - http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/home 'Get involved' - 'Education' - for students, **school monitoring activities** / for educators. See also other regional NRM Education sites

WELCOME TO NEW MEMBERS:

Nathan Judd
Jo Thompson
Tania Craig
Cheree Reichl
Maureen Highet
Barry Rolton
Lyn Skinner
Douglas Hackett
Donna Dawson
Mark Loram
Amelia Detmar
Dianne Wood
Keith Lockwood
Marguerite Wark
Alan Burns
Dianne Lynch
Nick Russell
Amanda Mouvet

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