

Castlemaine Naturalist

July 2022

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Monthly newsletter of the
Castlemaine Field Naturalists Club Inc.



Cortinarius archeri
Photo: Cathrine Harboe-Ree

June Meeting report: “Can bees count?”

How big a brain do you need to demonstrate intelligence? This was one of the questions posed by Dr Scarlett Howard from Monash University who spoke at our June meeting. Her talk, “What’s on a bee’s mind? Understanding the behaviours of native and introduced bees” explored the behaviour of bees.

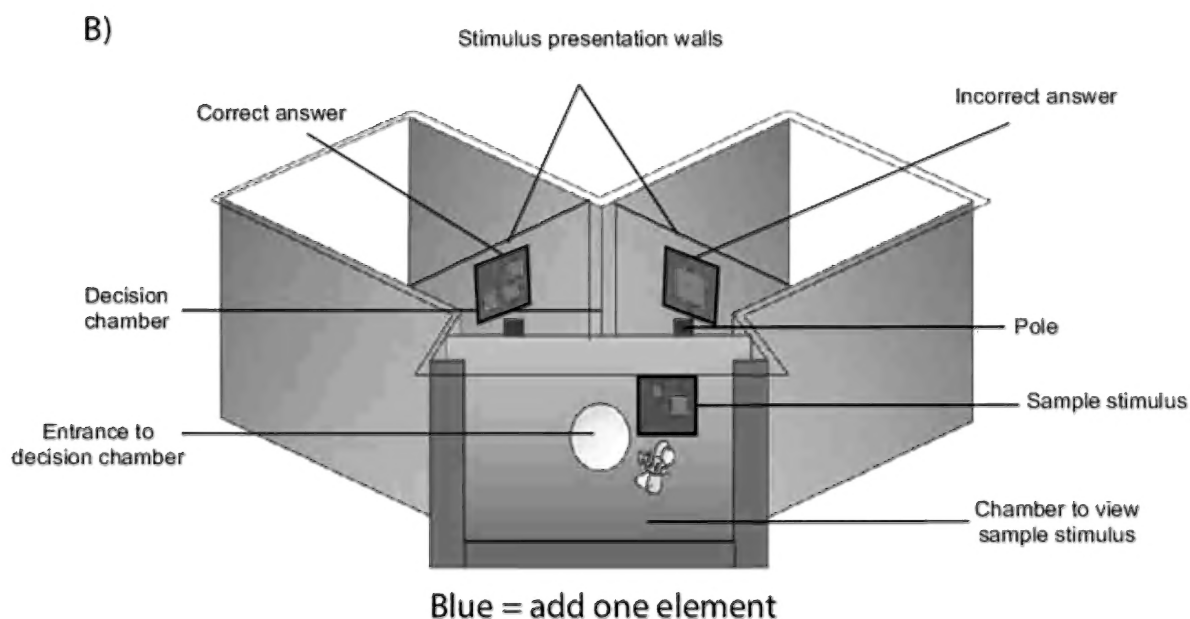
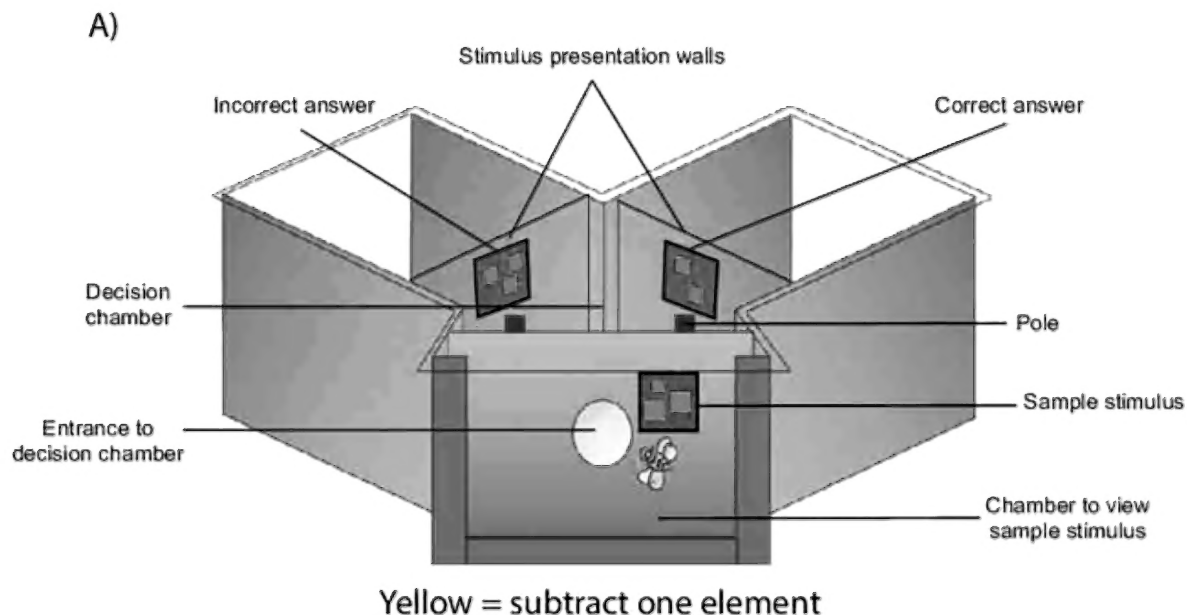
Through a series of controlled experiments Dr Howard has shown that honeybees can distinguish the size, shape and colour of flowers and reliably choose those flowers that provide the best food resources. Part of this involved training the honeybees to recognise colours and forms that were not part of their normal foraging behaviour and showing that the bees could apply this learning in novel situations.



This training was extended to examining the mathematical ability of bees. Initial experiments in this area showed that bees were able to comprehend size differences (quantity discrimination) and understand the rules $>$ (greater than) and $<$ (less than). Through a series of experiments Dr Howard has extended our understanding of the mathematical ability of honeybees. One significant area is to demonstrate that bees have an understanding of the concept of zero and can place zero (nothing) at the low end of a number line i.e. $0 < 1 < 2 < 3 \dots$. To demonstrate this an experiment was devised where a reward

was used to train bees to select the lower of two numbers e.g. 3 vs 4, 6 vs 3 and so on. This is the ‘less than’ rule. Once trained, the bees were presented with a previously unseen choice that included an empty set, i.e. zero. Bees that had been trained to recognise the less than rule chose the empty set rather than a higher value number. Further work in this area demonstrated that bees could differentiate between zero and one however they performed better when the numbers were further apart.

To further test the numerical ability of honeybees they were trained to carry out either addition or subtraction using a reward of sugar water if correct and bitter quinine if incorrect. Over many trials the bees learnt the different colours associated with +1 and -1. When tested with novel numbers the performance of trained bees was much better (64-72%) than if they were choosing by chance (50%). Similar experiments have been set up to show that honeybees can distinguish between odd and even numbers but unlike humans who have a bias to even numbers, bees have a bias towards odd numbers.



The Y maze used for training honeybees. Scarlett Howard / The Conversation

<https://theconversation.com/can-bees-do-maths-yes-new-research-shows-they-can-add-and-subtract-108074> Published: February 7, 2019

<https://theconversation.com/we-taught-bees-a-simple-number-language-and-they-got-it-117816> Published: June 5, 2019

This work is now being extended to our native bees. Native bees do not have the same predictable foraging habit of honeybees, so it is not as easy to train them using a reward of sugar water. Instead, training is by creating an aversion to an incorrect response by using forceps to lightly pinch the bee on the abdomen. This mimics an unsuccessful attack by a crab spider which hides in flowers waiting to pounce on its prey. For native bees, flower shape and colour have been shown to be very important. Native bees are more discriminating than honeybees when it comes to flower shape showing a greater preference for native insect pollinated flowers, whereas honeybees will also visit bird pollinated flowers and introduced flowers to a greater extent.

So why study bee brains? The bee brain has less than 1 million neurons compared to 86 billion for the human brain. These findings show that understanding maths is something many brains may achieve and helps explain how human cultures developed numeracy. Using a relative simple brain it may point the way to developing new ways and rules applicable to the development of artificial intelligence.

This was a fascinating talk that left us all with something to think about and a better understanding of the intelligence of other organisms. You can read more about Dr Howard's work in a series of articles she has written for The Conversation:

<https://theconversation.com/bees-join-an-elite-group-of-species-that-understands-the-concept-of-zero-as-a-number-97316> Published: June 8, 2018

<https://theconversation.com/just-like-how-humans-recognise-faces-bees-are-born-with-an-innate-ability-to-find-and-remember-flowers-172222> Published: November 22, 2021

<https://theconversation.com/honeybees-join-humans-as-the-only-known-animals-that-can-tell-the-difference-between-odd-and-even-numbers-181040> Published: April 29, 2022

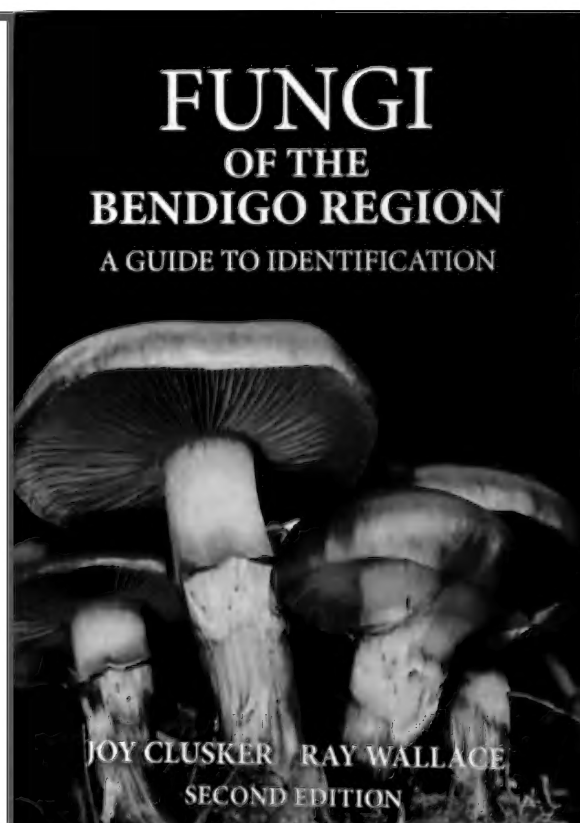
Euan Moore

New edition of "Fungi of the Bendigo Region"

By Joy Clusker and Ray Wallace

Readers will be pleased to know that Joy and Ray have recently published a second edition of their wonderful guide to the fungi of the Bendigo region. They have included 65 new species and updated names. There is a useful introduction followed by excellent photographs and key identification features for each species.

The book is available from Stonemans bookshop in Castlemaine or directly from Joy joyclusker@icloud.com



June Excursion report – “Moss Foray at Clinkers Hill Bushland Reserve with Cassia Read”

On Saturday 11th June, an excellent turn-out of enthusiastic naturalists were treated to a privileged insight into the miniature world of mosses from local moss expert and author* Dr Cassia Read. The Clinkers Hill Reserve proved to be a perfect site for appreciating the variety of mosses in our local bushlands, their habitats and role in the ecosystem. After recent rains, the mosses were well pumped and green in contrast to the dried and browner (but still living) specimens we see in warmer months. Cassia commenced by explaining that mosses were members of the Bryophyte group, a diverse group of plants including the first colonisers of our planet. Their ability to survive harsh conditions explains their persistence through droughts and even fires as well as their rapid colonisation of disturbed ground. As we walked slowly through the bushland, Cassia pointed out mosses on the soil, logs and trees, and even rocks, noting that different species favoured these different substrates. We were fortunate to have been able to borrow some hand lenses from Connecting Country, so it was ‘bums in the air’ as we peered closely to see the leaf shapes, arrangements and veins



Up close to mosses and lichens with Cassia thanks to some hand lenses from Connecting Country. *Photo: Euan Moore*

that Cassia described to help identify moss species. However, our first lesson was to distinguish mosses from lichens and liverworts! Mosses have stems with leaves and brighter green colours. Many lichens and liverworts were also seen on our wander and Cassia clearly showed the resilience of lichens as she sprayed a dish of desiccated ‘popcorn’ lichens with water, causing them to steadily unfurl into plump, more recognisable specimens.

We learnt about the reproductive life cycle of mosses and found mosses with spore capsules whose shape and structure can also be useful identifiers. We found a patch of spreading green filaments (protonema) on the ground which was the first growth of moss where spores had landed. As we moved along through the bush, some names were becoming familiar and Cassia gave us helpful tips on the origins of the some of the names. For example genus names could be from the names of botanists (e.g. *Breutelia* sp. after Bishop Breutel (alternatively, as Cassia suggests: *et tu Brute!*)) or the structure of the moss plant (e.g. *Triquetrella* sp. with 3 rows of leaves along the stem. *Tayloria* moss was named after the scientist Thomas Taylor who first described this moss on decaying clothes and bones of a corpse in Tasmania! Interestingly, the sporophyte (sporing body) of *Tayloria* smells a bit off to attract flies that distribute its spores. Cassia has co-authored an excellent pocket field guide to the mosses of our region* providing an overview of mosses and gallery of photographs with succinct descriptions to aid identification.



Triquetrella papillata & *Polytrichum juniperinum* (larger). Photo: Jill Williams

Our final discussion was the important topic of climate change and how this will impact mosses and lichens. Cassia stressed the important role of mosses in holding soils together and how this can be lost when there is disturbance e.g. from grazing stock. The desert crust-like plants including mosses are likely to become more important for this role with rising temperatures. Other climate factors that could impact mosses would be increased summer rains, impeding photosynthesis and causing mosses to ‘wake up’ only to then get ‘cooked’ by following hot spells. With the resilience of mosses, it is likely that mosses will survive but with changes in the mix of species in an area.



Cladia corallaizon (Coral Lichen) with fruiting bodies. Photo: Cathrine Harboe-Ree

With the resilience of mosses, it is likely that mosses will survive but with changes in the mix of species in an area.

We all walked carefully back through the bush, tip-toeing around those seemingly insignificant green patches with much greater respect and appreciation. Thank you Cassia for an inspiring excursion!

* “Mosses of dry forests in south eastern Australia” by Cassia Read and Bernard Slattery. A Friends of Box Ironbark Forests publication, 2014.

Jenny Rolland

We have a New Website!



After a year of discussions and the preparation of content, we now have a new website which went live at the end of June.

Please take a look at castlemainefieldnaturalists.org.au where you will find much more information about our club, activities and local flora and fauna.

All members who receive emails from the club and those who “followed” our old website will be subscribed to our eNews on the new website. You will receive updates on monthly meetings, excursions and other events as well as other news relevant to our activities. Links to our old website will be redirected to the new website.

We hope you enjoy the new website and share it with your friends!

Well done Euan Moore for driving this project and a big thank you to all those who helped load material and checked the new website test site.

We are very grateful to SEANA for their financial support and to Greengraphics for designing and developing the website.

Birds of Sutton Grange June 2022 – Nigel Harland

Superb Fairywren	Galah	New Holland Honeyeater
White-browed Scrubwren	Long-billed Corella	Yellow-tufted Honeyeater
Red-browed Finch	Little Corella	Australian Magpie
Striated Pardalote	Crimson Rosella	Australian Raven
Spotted Pardalote	Eastern Rosella	Grey Currawong
Welcome Swallow	Sulphur-crested Cockatoo	Black-faced Cuckooshrike
Common Bronzewing	Red Wattlebird	Magpie Lark
Laughing Kookaburra	Eurasian Blackbird	

Goldfields Track Visitor Enhancement Project

The State Government has provided funding to upgrade the interpretive signage and related features along the Goldfields Track. This will include four visitor hubs, eight trailhead boards and up to 100 signs to interpret the environment and history of the track.

You are invited to share your stories of the Goldfields Track. One way to do this is by visiting <https://rmcg.mysocialpinpoint.com/goldfields-track> and loading a comment at a specific point on the map. You can also contact the team working on the project by email at goldfields@rmcg.com.au or by phone (03) 5441 4821 to discuss your stories of the track and provide information.

Mistletoes

George Broadway

Driving back from Bendigo recently I remarked on the absence of Mistletoes on the Red Gums lining the road. There is a marked contrast between that section of road and the old highway to the South of Harcourt where the Red Gums are heavily infested with Creeping Mistletoe (*Muellerina eucalyptoides*). Not only that, but there is also an absence of the Box Mistletoe (*Amyema miquellii*). I did not see any of the latter until we reached the Harcourt roundabout. Can it be that Mistletoe Birds are averse to operating along major Highways?

While on the subject of Mistletoes, do you know that on the walking track between Castlemaine and Chewton, at a spot near Manchester Street, four of the local Mistletoes may be seen within a distance of about 100 metres. Near the end of the street may be seen Box Mistletoe (*Amyema miquellii*), Wiry Mistletoe (*Amyema preissii*), and Grey Mistletoe (*Amyema quandang*). All within a few metres. At a short distance (ca 100 m) towards Chewton there is a seat for weary walkers (like me). On the opposite side of the track on a solitary Acacia may be seen a Harlequin Mistletoe (*Lysiana exocarpi*). To find the other two locals it is necessary (as far as I know) to travel a little further. Creeping Mistletoe is found in abundance along the old highway south of Harcourt while there is an excellent specimen of Drooping Mistletoe (*Amyema pendula*) just north of Taradale where the old highway, now known as Wright Street, leaves the old highway now the C794 and before it crosses the water race. There are of course others but that one is easily found.



Drooping Mistletoe, *Amyema pendula*, showing sessile middle flower



Harlequin Mistletoe, *Lysiana exocarpi*

Observations

Geraldine Harris



Little Mastiff-bat/Little Freetail Bat.
Note the 'free' tail.



Blind snake (*Anilius nigrescens*) found under a rock in Willy Milly Road. The eyes and flicking tongue can be seen on the left. Note the scales.



Newly hatched Monarch butterfly that our grandchildren had been watching.

Jill Williams



Badge Huntsman (*Neosparassus diana*). Right: underside showing the 'badge'.



Rain moths (*Abantiades atripalpis*). Left: larval case. Right: female (upper, ~8cm long) and male (lower).

Mez Woodward – Promise of orchid flowers to come!



Gnat Orchid (*Cyrstostylis reniformis*)



Slaty Helmet-orchid (*Corybas incurvus*)

Cathrine Harboe-Ree

Fungi seen on a recent trip to the Otways.



Podoscypha petalodes (Rosette Fungus) (Uncommon)

Judith Nimmo



A (dead) Blue-banded Bee from downtown Castlemaine.



Podoserpula pusio (Pagoda fungus)
(Not found in the Castlemaine region)

Kerrie Jennings - Tawny Frogmouth (*Podargus strigoides*)

Searching for slugs in farm paddocks does have its upside. Night birds are an often overlooked but integral part of the Australian ecosystem and after dark is the time when we are most rewarded. Chance encounters bring joy to our night-time outings and adds richness to our knowledge of natural species.

One such occasion was a recent trip to the Moolort Plains side of the Loddon River to inspect our emerging Canola crop. Perched watchfully on a gatepost and reluctant to move was a beautiful Tawny Frogmouth, casually eyeing the approaching farm ute. Another was observed flying around close by before disappearing into the canopy of an adjacent old Grey Box.

Cursing that I'd left my 'good' camera at home, I did my best with the mobile phone. Our obliging Tawny sat willingly until I attempted to open the gate.

Tawny Frogmouths are "widespread, resident and moderately common" says Chris Tzaros in *Wildlife of the Box Ironbark*. Our farmland with scattered mature Yellow Box and Grey Box in addition to the Loddon River lined with mature, old River Red Gums provide habitat for foraging and their mysterious roosting. Their bark coloured plumage and cryptic stick-like postures make them masters of disguise. Seldom seen by day,



"...often mistaken for a broken-off branch" says Chris Tzaros; discovered at times by the "...presence of whitish excreta and regurgitated pellets of prey remains below."

Our farm Tawny Frogmouths were likely perched low and hunting for large nocturnal insects, centipedes, spiders or frogs that hide in cracks and under the Volcanic Plains rocks, or perhaps tidying up a few of our pesky farm slugs. With silent flight, they pounce, or glide low like a Kookaburra, seizing their prey with their heavy snap-trap like flattened bill and broad gape. Breeding is Aug-Dec in a flimsy stick nest, high on a horizontal branch, birds are likely monogamous. Threats include vehicle-strike while seeking prey along roadsides, domestic pets, foxes and pesticides. Our old ears don't seem often to hear their 'soon after dusk' low oom-oom-oom calls now, although they were captured regularly during our acoustic nightbird surveys using Song Meters. This project included Museums Victoria, VNPA, and a supportive group of locals including amongst others Castlemaine Field Naturalists members, Euan Moore & Jenny Rolland and Damian Kelly. It was a wonderful, inclusive and interesting learning experience.

COMING EVENTS

MONTHLY MEETING: Friday 8th July, 7.30pm, by Zoom

(see details for joining on the back page)

Speaker: Dr Melinda Waterman, University of Wollongong “The Old-growth Moss Forests of Antarctica”

The lush moss beds that grow near East Antarctica's coast are among the only plants that can withstand life on the frozen continent. Because it contains the best moss beds on continental Antarctica, Casey Station is dubbed the 'Daintree of the Antarctic'. Individual plants have been growing here for at least 100 years; fertilised by ancient penguin poo.

But our new research shows that these slow-growing plants are changing at a far faster rate than anticipated. The healthy green moss beds are turning red or grey, indicating that plants are under stress and dying. This is due to the area drying because of colder summers and stronger winds. This increased desertification of East Antarctica is caused by both climate change and ozone depletion.'

EXCURSION: Saturday 9th July, 1.30 pm

“Muckleford Forest and the Red White & Blue Mine”

Leaders: Peter and Rosemary Turner

Starting from the junction of Muckleford School Road and Bells Lane Track, we will drive along Talbot, Dunns Reef and Red White and Blue Tracks, with stops along the way to enjoy the birds, wildflowers and trees of the forest and to view old mining sites. We will then drive along Bells Lane Track to the Muckleford NCR to inspect recent work to create a Strategic Fuel Break along the north side of the track. Finally, back to the RW&B picnic ground and dam for some birdwatching and afternoon tea. Our route is described in the leaflet “Muckleford Forest Walk to the Red White and Blue Mine” which is available from the Information Centre, Castlemaine.

Meet: 1.30 pm at the Octopus (Duke St, opposite the Castle Motel) or **1.50 pm** at the end of Muckleford School Road, where it meets Bells Lane Track.

Bring: Binoculars, water, afternoon tea, sturdy shoes and hat.

The Field Trip will be cancelled in extreme weather conditions.

Disclaimer: The opinions expressed in this newsletter are those of the contributors and not necessarily those of the club

Castlemaine Field Naturalists Club PROGRAM

Monthly meetings are being held on-line via Zoom during the winter months (June – August), commencing at 7.30pm. If you have registered for our previous webinar meetings you will be sent the link for registering with Zoom. If you have not joined before and wish to attend, please email Peter Turner at munrodsl@inet.net.au

Our guest speaker will follow the usual 'observations' session when members can share recent interesting sightings with an option to show a photo or two. If you have photos for the meeting, please email JPEG file(s) to Euan Moore at calamanthus5@bigpond.com by noon on the day of the meeting.

Excursions are on the Saturday after the monthly meeting. Meet at the Octopus (opposite the motel in Duke St) for departure at 1.30pm unless otherwise advised.

Fri July 8 Meeting 7.30pm: Dr Melinda Waterman (Uni of Wollongong) “The Old-growth Moss Forests of Antarctica”

Sat July 9 Excursion 1.30pm: “Muckleford Forest and Red, White and Blue mine”, leaders Peter and Rosemary Turner

Fri August 12 Meeting 7.30pm: Tanya Loos “Window strike: when birds hit windows”. Combined meeting with Birdlife Castlemaine District

Sat August 13 1.30pm: “Eureka Reef walk

Fri Sept 9 Meeting 7.30pm: Nick Deacon (Deakin Uni) “Powerful Owl ecology - comparison of rural and forested environments”

Sat Sept 10 Excursion 1.30pm: Julie Radford “Orchid search, Castlemaine”

Castlemaine Naturalist - email newsletter material to: newsletter.cfnc@gmail.com

* Deadline for the August edition: **29th July**

Club website (Webmaster: Ron Wescott) – www.castlemainefieldnaturalists.org.au

Subscriptions for 2022 (Membership forms on CFNC website)

Ordinary membership: Single \$35, Family \$50

Pensioner or student: Single \$25, Family \$30

Subscription includes the monthly newsletter, Castlemaine Naturalist.

2022 Committee

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