



Red-bellied Black snake. Photo taken from presentation of Prof. Rick Shine

Using research to conserve Australian snakes

By Prof. Rick Shine AM FAA

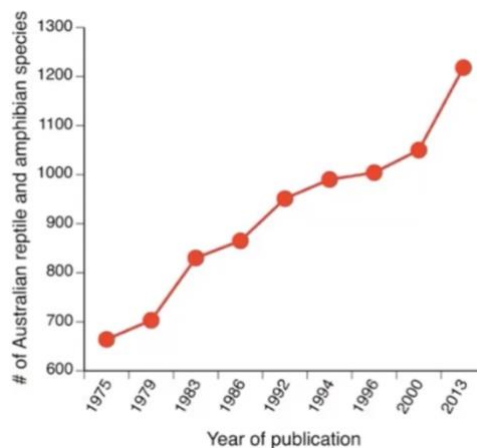
Prof. Rick Shine, our guest speaker for July, started by posing a fundamental question - what is the point of doing all the research, how can it be applied for conservation of snakes?

There are at least 170 or so species of Australian snakes but most are small and harmless. 50 of the 170 are blind snakes which are commonly misidentified as worms. At the other end of the size scale there are 15 species of large pythons, 11 species of harmless snakes and 2 species of file snakes - slow moving snakes with baggy skins that spend their life under water.

There are more than 100+ species of venomous front-fanged land snakes – the elapids and within these elapids there are 32 species of sea snakes.

But we don't really know how many species there are.

Hal Cogger's 'Reptiles and Amphibians of Australia' field guide first edition 1970s, noted 650 species of reptiles and amphibians in Australia, the newest edition has about twice that number (graph below). The biodiversity has been massively underestimated.



Why bother to conserve snakes?

Ecological role – prey and predators.

Medical – medicine from venoms.

Economic – consume rodent pests, especially the Bown snake on farms.

Aesthetics – each species is a work of art sculpted by evolution over millions of years.

Cultural – snakes are indigenous icons maintaining the continuity of aboriginal cultural song lines.

Why are snakes disappearing?

Rick's opinion is that the illegal trade of snakes is not that significant. The species which are traded can sustain that harvest although the manner in which they are transported can be very distressing. Worldwide

The Castlemaine Field Naturalists Club acknowledges the Dja Dja Wurrung community as the Traditional Owners and Custodians of the Country where we meet and study the natural environment. We pay our respects to their Elders, past, present and future.

habitat destruction is a bigger problem. Climate change is catastrophic for some kinds of snakes because they are so intimately dependent on ambient temperatures. Feral pests like cats and foxes, cane toads and disease are real threats to snake populations.

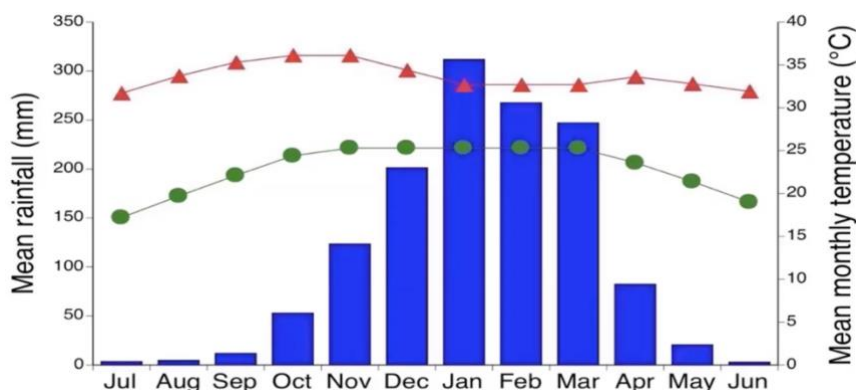
To understand what's happening we need research. Many of the problems and solutions look obvious but research is showing that things are often more complicated than they appear. Researchers are becoming aware of the causes of the declines and that research has a huge role to play in conservation initiatives of which the general public may not be fully aware. Rick proceeded to present 3 examples from his research.

Example 1 - Tropical snakes and climate change. In the 1980s Rick set up a research base at Fogg Dam, east of Darwin. The diversity and abundance of tropical snakes is immense. The site consists of a dam, a dam wall and a flood plain on the other side which fills up when the monsoonal rains inundate the landscape.



The climate in tropical north is always hot (the red triangles in graph). But the rainfall is concentrated when the

monsoons come through at the end of the year (green circles in graph). The amount of rain can



vary from year to year. Some years of heavy rain either early or late or years with little rain early or late or a year with very little rain at all. And this drives the ecology of the Water Pythons that were the main study animal.



Water Python, *Liasis fuscus*
Photo: Thomas Madsen.

The amount of rain determines the conditions for the native rats. Monsoonal rain drives the abundance of prey (rats) which in turn drive Python feeding

rates, body condition, growth, survival and reproduction. Many years of data led them to believe that they could develop models based on climate change.

But that was questioned on 7th March 2007, when heavy rain on the Adelaide River floodplain

upstream from the study area sent a tsunami downriver that drowned all the rats but not the snakes. This was a local effect as a short distance away, on higher ground the rat

numbers were 'normal'. After this event the body mass of the Water Pythons at Fogg Dam were much lower than had been recorded before while those on the higher ground were normal. The Water Pythons at Fogg Dam were wiped out for the next several years due to a local event. In addition a mysterious decades-long decline of small mammals across tropical Australia has prevented the recovery of the rats and thus, the Water Pythons. Several factors could be responsible – feral cats, wild fires which in turn have been driven by invasive pasture grasses, invasive herbivores such as buffalo. So while debateable it still means there is no food for a mammal eating reptile. So the Pythons of tropical Australia are

in trouble and the Water Pythons have never been able to recover from that drowning event. Climate change may

threaten populations because of brief but more frequent extreme events, rather than shifts in average conditions.

Example 2 – The impact of the invasive Cane Toad on native predators. The Cane Toad was introduced from South America to Australia in 1935 and in 90 years has spread across tropical Australia. Australia has no native toads but we do have frogs which secrete toxins on their skin. So Australian predators have evolved with the toxic frogs but not with the toxic Cane Toads. When predators eat the toxic frogs, they capture them first, wait about 15 mins for the toxins to degrade and then safely eat the frogs. The toxin of the Cane Toads located in large glands on the shoulders does not degrade and so on ingestion the predator dies of a heart attack.

The researchers were studying Death Adders when the Cane Toads arrived at Fogg Dam. 50% of the radio-tracked snakes were killed by eating toads. Death Adders are especially vulnerable. They're an ambush predator. They rely a lot on wiggling their tail tips to attract prey. Unlike the local lizards and frogs who know over evolution time that a wiggling tail signals a trap the Cane Toad is an easy catch for the Death Adder and it will die. But it is not all bad news. Goannas and Monitors prey on Death Adders and when they arrived also the Cane Toad. As the Goanna numbers went down due to eating the Cane Toads, the Death Adder snakes have become MORE abundant, not less abundant since the arrival of the Cane Toads which is counterintuitive.

But tragically, some snake species have been badly affected by the toad invasion such as the King Brown snake. These were very common in the Northern Territory but virtually disappeared within a year of the arrival of the Cane Toad.

Taste aversion. All of the toads



King Brown snake, *Pseudechis australis* with a Cane Toad in its mouth.

Photo: from Rick Shine presentation

at the invasion front are large with large toxin glands and so are lethal.

Starting with the Northern Quoll the researchers determined that a predator that eats a small toad gets sick but survives and learns not to eat toads. This taste aversion worked for Blue Tongue Skinks and for the big Goannas. Working with indigenous communities from March 2018 to March 2021, 200,000 toad eggs, tadpoles and metamorphs (juveniles) were released in advance of the toad front in the Kimberly region of WA. Releasing the 'teacher toads' saved the Goannas but doesn't seem to have helped the Bluetongues or snakes. It seemed that even a small toad can be fatal for a snake. The challenge then being how to obtain toads with less poison? Expertise in modern molecular genetics will aim to knock out particular genes which code for the toxin resulting in a less

poisonous Cane Toad. These toads are not genetically modified nor transgenic. They don't contain genetic material from any other organism. The researchers hope to release a safer 'teacher toad' in the next couple of years enabling reptile predators to coexist with toads.

Example 3 – The decline of sea snakes. Sea snakes are abundant and are important components of coral reef ecosystems but have declined in many parts of the world. The easy answers could be habitat destruction due to coral bleaching, overfishing, water pollution, sediment accumulation from human activities etc. The decline is obvious where the habitat is so degraded. But this decline is also happening in places which look pristine such as at Ile aux Canards, New Caledonia. The reef has been protected by local authorities but visits by tourists have increased. Could the snakes be predated on by recovering populations of predatory fishes? Tactically and ethically it is difficult to test this theory so the researchers used fishing lures which looked like the small sea snakes – sample below.



When dragged through the water, the snake-shaped fishing lures were attacked by several species of fish. On the one hand habitat destruction reduces the fish food for sea snakes but if a system is protected well enough then all the big predatory fish species recover.

Sea snakes are vulnerable because unlike land snakes they can't escape periods of very hot weather, they are exposed to predators every time they surface to take a breath and they can only persist in places with intact habitat with prey but

with not too many large predators (the Goldilocks zone)..

So what are the implications for conservation? Some problems are species specific. Some species are doing well against the toxic cane toad but targeted management may be needed to save others. For the Water Pythons, sea snakes and others, climate change needs to be addressed globally which is incredibly difficult to do. These local declines are driven by global processes.

Most Australian snake species are declining and some will go extinct. New challenges like

invasive fire ants will hasten that decline but then a few species are even increasing in numbers. The Brown snakes are doing well because humans have provided the mice and the big Pythons are thriving in local gardens with fruit trees which attract possums and rodents. Research on more species is required and the public must be involved to convince Australians and then politicians that snakes are worth conserving.

Many thanks Rick for a fascinating story on the importance of conserving Australian snakes.

Jill Williams

Fungi search at the Oak Forest, Harcourt – post bushfire recovery. Saturday July 11th

By Euan Moore

Our July fungi excursion led by Joy Clusker was extremely well attended with 16 members and 17 visitors present. This was in spite of less than ideal weather and a last minute change of venue to the Oak Forest at Harcourt due to storm damage of the fungi at our original location, Bullarto.

Joy took us through the Oak Forest and up the slope into the area that was burnt in the January Harcourt fire. The Oak Forest had not burnt, presumably due to the damper conditions in this type of forest during summer and the path taken by the fire as it moved into the park from nearby farmland, however the nearby native forest had been severely impacted by the fire.

There were relatively few fungi in the Oak Forest although the introduced and spectacular Fly

Agaric, *Amanita muscaria*, was seen at several locations.

Moving into the burnt area there were many more fungi present. Many were species that respond to fire. Following fire, there is a succession of fungi producing fruiting bodies. It was too long after the fire for us to see some of the earliest responders although there were plenty of the second phase of responders, including disc and cup fungi, gilled fungi and polypores. Those species that are particularly associated with fire are flagged in the table, below.

After fire, fungi play an important role in stabilising the forest and aiding recovery. Their mycelium holds the soil together and reduces the impact of runoff following rain – there is more water infiltrating the soil and less sediment washed into

creeks. Disc and cup fungi are particularly important here.



Rainbow Bracket, *Trametes versicolor*
Photo: Cath Jolly

The fungi also alter the soil chemistry. Immediately after fire the soil pH can rise from 7 (neutral) to 10 (basic). One of the effects fungi have is to

release acids and bring the soil back to a more neutral state. Many fungi have a symbiotic association with the trees so are important for their recovery.

The other major benefit that the fungi bring is the ability to break down the dead wood and roots that remain after the fire. This releases nutrients back into the soil which also aids recovery.

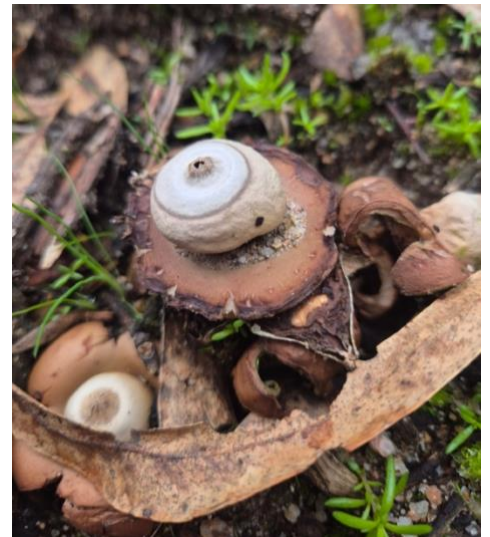
Overall the forest is starting to recover from the fire. The birds are returning. Trees are producing epicormic growth and various herbs, native and introduced, are starting to form a ground cover. Golden Wattle (*Acacia pycnantha*) and Spreading Wattle (*Acacia genistifolia*) were flowering and some Early Nancy (*Wurmbea dioica*) flowers were spotted. Most importantly, fungi, mosses, algae and lichen are forming a cryptogammic crust which is protecting the soil and creating a stable environment for seeds to germinate.

The group delighted in finding a variety of fungi with a diversity of shapes, sizes and colours, despite the fire-damaged bush. Joy helped with their ID, pointing out distinguishing features and noting their different substrates. Attracting particular attention was a cluster of *Poronia erici* fungi on a kangaroo dropping.

In total we found 41 species. The full list (with notes) is shown below. Members are adding their photos to iNaturalist with a link to the *Fungimap* project to aid mapping of fungi distribution and hence with their conservation. A link to iNaturalist where these photos can be seen is: [Oak Forest fungi observations](#).

Thank you Joy, for leading another exciting and informative fungi search!

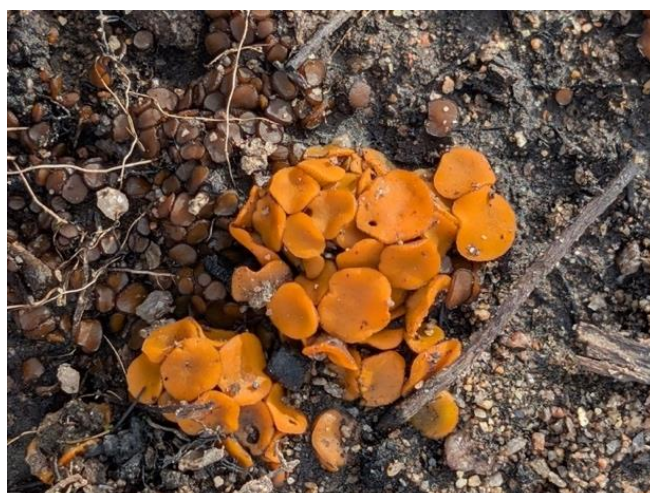
Collared Earthstar, *Gaeastrum triplex*
Photo: Jenny Rolland



Brittlestems
Genus *Psathyrella*
One of the fire fungi.
Photo: Noel Young



Dung Button
Poronia erici
On Kangaroo dung.
Photo: Euan Moore



Yellow Earth Buttons
Phaeohelotium baileyana
One of the fire fungi.
Photo: Cath Jolly

List of species

This table has been compiled from information provided by Joy Clusker combined with identifications confirmed on iNaturalist. Not all fungi in this list have been loaded to iNaturalist.

Name	Common name	Notes	iNat	Fire
Gilled Fungi				
* <i>Amanita muscaria</i>	Fly Agaric	Under pines & oaks	Y	
<i>Clitocybe brunneoceracea</i>	Brownwax Cly	Aka <i>Pseudolyophyllum brunneoceraceum</i>	Y	
<i>Cortinarius sublargus</i>				Y
<i>Cortinarius sp.</i>				
<i>Gallerina hypnorum</i>				
<i>Gymnopilus junonius</i>	Spectacular Rustgill	Base of burnt trees	Y	
<i>Inocybe fibrillosibrunnea</i>				
<i>Inocybe lacera?</i>	Torn Fibrecap	Open ground		
<i>Hygrocybe sp. white</i>				Y
<i>Lactarius deliciosus</i>	Saffron Milkcap	Under pines	Y	
<i>Laccaria laccata var. laccata</i>				Y
<i>Laccaria sp.</i>				
<i>Mycena galertrina</i>		Base of trees/open ground		
<i>Oudemansiella gigaspora</i>	Rooting Shank	Open ground	Y	
<i>Pholiota carbonaria</i>	Bonfire Scalycap	Was <i>Pholiota highlandensis</i>		Y
<i>Pholiota communis</i>				
<i>Psathyrella aff pennata</i>		Burnt areas at base of trees		Y
<i>Psilocybe subaeruginosa</i>		Open ground		
<i>Russula purpureoflava</i>	Purple Brittlegill	Open ground under pines		
<i>Singerocybe clitocyboides</i>				
<i>Tapinella panuoides</i>	Oyster Rollrim	On fallen logs		
Boletes				
<i>Boletus carramarus</i>				
* <i>Suillus collinitus</i>		Open ground		
Puffballs				
<i>Pisolithus marmoratus</i>	Horse-dropping fungus			
<i>Scleroderma cepa</i>	Onion Earthball	Open ground		
Earth Stars				
<i>Geastrum triplex</i>	Collared Earthstar	Open ground	Y	
Polypores				
<i>Trametes coccinea</i>	Scarlet Bracket	On dead wood on ground	Y	
<i>Trametes versicolor</i>	Rainbow Bracket / Turkey Tails	On fallen oak log	Y	
Resupinates				
<i>Aleurodiscus sparsus</i>	White paint-splash	Mat on fallen logs		
<i>Coniophora olivacea</i>	olive-green resupinate	Mat on fallen logs		
<i>Peniophorella sp</i>		On fallen logs		
Ascomycota				
<i>Anthracobia muelleri</i>		On burnt ground		Y
<i>Byssonectria fusispora</i>				Y

<i>Daldinia vernicosa</i>		On burnt bark of standing trees		
<i>Geoscypha tenacella</i>		On burnt ground		Y
<i>Peziza thozetti</i>	Home Cup	On burnt ground		
<i>Peziza domiciliana</i>	Home Cup	On burnt ground	Y	
<i>Phaeohelotium baileyana</i>	Yellow Earth Buttons	On burnt ground	Y	Y
<i>Plicaria recurva</i>				Y
<i>Poronia erici</i>	Dung Button	On kangaroo dung	Y	
<i>Pulvinula archeri</i>		On burnt ground		Y

OBSERVATIONS

Australian Grebe on the 'big' farm dam at Baringhup

Early this year, as the landscape dried, the number of waterbirds on our farm dam substantially increased. Our late-April 'Birds on Farms' survey recorded 9 species and a total of 171 individual birds, mostly Pacific Black Duck, Eurasian Coot, and Grey Teal.

Recent good rainfall has changed things. On return for a 'Birds on Farms' count in early July, the dam seemed almost uninhabited, with 6 waterbird species and a total of just 19 individuals. How things have adjusted, as our feathered visitors have now willingly dispersed into the wider, rain-soaked landscape.

However, there's seldom not an Australian Grebe present. These little inland birds of personality can undertake long flights at night and sometimes turn up in unexpected places. They have a strong preference for freshwater and tend to dive rather than fly when disturbed. They are reported to feed on fish and invertebrates, catching most of their food underwater. In our farm dam, this could possibly be yabbies, tadpoles, bugs, dragonfly nymphs and insect larvae.



Kerrie Jennings

Powerful Owls in the Castlemaine Botanical Gardens



This year the CBG powerful owls have again raised just one young. The adult female started sitting about April 22. The youngster started peering out of the nest hollow on 13th July and was out of the nest on 24th for its first portrait (2.30 pm). It then showed around dusk that it could already fly sturdily to another tree where an adult with remains of ringtail possum fed it.

Peter Turner



Clare Claydon was out viewing the impact of the recent rains.

Left: The Coliban river roaring over the Cascades at Metcalf.

Right: The Campaspe river above Turpin Falls – Barfold.

Left: Clare Claydon asked the audience to help identify these 'pearl-like buttons' on the moist ground. The consensus was most likely skink eggs.

Right: What may have caused the bark damage on the trunk of this tree? Uncertain that it might have been possums or gliders.



Jenny Rolland and Euan Moore recently did a survey on Mt. Alexander. These 2 species were some of the first flowers to be seen following the fire. The start of the recovery. Left: Sweet Hound's-Tongue, *Hackelia suaveolens*. Centre: Common Rice Flower, *Pimelea humilis*. Right: Some of the burnt area.

Very few insects and Arachnids around Jill Williams' veranda during the cold, wet weather.

Left: *Leptocroca sanguinolenta*.

Right: Genus *Spinaarachne* a member of Crab spiders.



Bird Monitoring - Citizen Science project proposal

With CFNC's knowledge, experience and interest in the environmental health and biodiversity of central Victoria, I am reaching out to gauge your interest in providing input into the development of a new project.

Through my role at The Ecology Office, I've been engaged to assist Parks Victoria to

(a) develop a bird monitoring program at the Mount Alexander Regional Park (Leanganook), and then

(b) undertake the first round of surveys in August using the *20 minute – 2 hectare* method. As a possible future extension to the project, these sites may then continue to be monitored periodically through the support and expertise of volunteer citizen scientists.

This project has been initiated as a response to the devastating wildfires which affected c. 85% of the Mount Alexander Regional Park in January 2026. A primary objective of the project is to obtain a greater understanding of the status of the threatened *Victorian Temperate Woodland Bird Community* within the park, in addition to the status of the bird assemblage as a whole. There are also multiple secondary objectives relating to aspects such as tracking bushfire recovery, and identifying additional threats to be addressed - and opportunities – as part of the future management of the park. The data collected will be lodged with the Victorian Biodiversity Atlas, as a minimum.

If there is interest and availability, I would be keen to chat with you and/or representative(s) of CFNC about aspects such as:

- Suggested locations for the ~20 bird monitoring sites
- Survey methods, including safety and logistics considerations
- Gauging potential interest in being involved in a future citizen science monitoring project, either directly (e.g., as surveyors) and/or indirectly (e.g., by promotion to your members and supporters) – noting that a positive response won't be used at all as a commitment to any future involvement.
- Types of support that would assist/encourage involvement of citizen scientists in any future citizen monitoring program.
- Your knowledge of birds and their habitats at the park.
- Connections with your existing projects, if relevant

This chat could either be in person or via telephone, Zoom/Teams online meeting – and could be as succinct as 15-20 minutes (or longer if you're available). Alternatively, if your availability is limited, it could be via email exchange - in which case I could send some more details for you to consider and respond to. But I also understand if you are presently unable to contribute at all to the development of this project.

For input into the initial survey sites and methods, we would need to chat before the 31 July – and I apologise for the tight timeframe. Alternatively, if you and/or representative(s) would be unable to meet with me until August, contributions at this later time would still be valuable in shaping my recommendations about the future directions of the monitoring program.

I appreciate your consideration of this request. Please feel free to get in contact if you need further information, clarification, etc.

Chris Timewell

Senior Ecologist

The ecology office

+61 417 621 901

Coming Events in August

Monthly meeting: Friday 14th August, 7.30pm by Zoom

Speaker: Donald Hobern

"The delicate world of plume moths"

Donald Hobern is an amateur lepidopterist and Vice-President of Moths and Butterflies Australia. He is also an internationally recognised biodiversity informatics specialist and was the inaugural director of the Atlas of Living Australia.

Donald has a particular interest in the beautiful plume moths (*Pterophoridae*) and many-plume moths (*Alucitidae*). Their name derives from the fact that most species have their wings divided into narrow lobes that resemble feathers or "plumes" because of the long fringe scales along the lobe margins.

Donald's presentation will focus on Victorian plume moth species, with some details on the wider Australian and global diversity of this large family. He has studied their life cycles, noting particular features of the caterpillar and pupa stages associated with their host plants.

How to join the Zoom meeting – Register in advance by clicking on the following link or copying this url into your browser:

<https://us06web.zoom.us/meeting/register/ZZKg76oyRouhkHW6i0aS2Q>

After registering, you will receive a confirmation email containing information about joining the session.

We recommend joining 5 – 10 minutes before the meeting to avoid congestion at 7.30pm.

Observations: Members and visitors are invited to share their interesting observations at the meeting. Please email any photos and supporting notes as uncropped JPEG file(s) to Jill Williams (jilliwill33@gmail.com) by noon on the day of the meeting.

Dowdy Plume moth, *Stenoptilia zophodactylus*.

Photo: Donald Hobern.



Excursion: Saturday 15th August, 1.30pm

"ANZAC Hill Walk, Maldon"

Leaders: Judy and Phil Hopley

This interesting walk will encompass the ANZAC Circle - a circle of 32 Yellow Gums planted to honour some of the local men and women who died in WWI. We will also visit the location of the WWII Air Observation Station and the Mount Tarrengower Tunnelling Company tunnel.

Bev Phillips, President of MULGA (Maldon Urban Landcare Group), will join us on the walk and talk about the replanting of the trees in 2018 and again in 2019.

The walk will conclude with our picnic afternoon tea as we enjoy a wonderful view of the historic Maldon township.

Meet: for car-pooling and **1.30pm** departure at the northern end of the car park, north of the Railway Goods Shed, Kennedy St. Castlemaine.

Or meet at **1.45pm** at the car park at the top of ANZAC Hill Rd ([Google Maps](#)).

Bring: water, snacks, **clean** sturdy shoes, chairs, afternoon tea.



Please note: excursions may be altered or cancelled due to weather or other exceptional factors. Check our website the day before the excursion in case there is a change (www.castlemainefieldnaturalists.org.au).

View from ANZAC Hill over the township of Maldon.

Photo: Philip Hopley

Roadside Clean-up, Monday 17th August, 9.00am

Time to check our stretch of the Pyrenees Highway!

Join us for a pleasant walk enjoying the wildflowers along some roadside bush as we do our bit for the community.

Meet: 9am near Tait's Decorative Iron, corner of Willy Milly Rd and Pyrenees Highway, Castlemaine.

Bring: Gloves, water, sturdy footwear. Garbage bags and safety vests supplied.

Contact: Geoff Harris (mob 0418 392 183) if you can help with the clean-up.

From the Committee

The Committee's focus is now very much on the SEANA meeting in October, with the process being ably led by Peter Turner and the organising committee. Another project ticking along as part of our 50th anniversary year is a history of the club, which local resident Gail Reynolds has generously volunteered to write for us.

As reported last month, Euan Moore has been given a phone app by DEECA to test so that we can record the occurrence of *Phytophthora* before fuel reduction burns are undertaken. The proposed monitoring will probably start in mid to late spring and extend across the summer. Actual dates will be determined by Forest Fire Management Victoria (FFMV) based on when they plan to do the fuel reduction burns. Spraying and surveys will be done about two weeks before the burn.

Euan has also been grappling with new Parks Victoria guidelines for registering events in locations it manages. This has proved to be a convoluted process that has led to Parks Victoria clarifying what is actually required from us and other organisations.

New members

We are delighted to report four new members in June: Bill Sampson, Vanessa Webster and Keighley and Indya Williams. We welcome them to the Club!



Australian Grebe on the 'big dam'
Photo: Kerrie Jennings

Program

Monthly Meetings: will be held on-line via Zoom again during the winter months (June, July and August) commencing at 7.30pm. Please register in advance (see "Coming Events" page) to receive the link for joining the meeting.

Excursions are held on the Saturday following the monthly meeting and leave from the northern end of the car park north of the Railway Goods Shed, Kennedy St. at 1.30pm unless stated otherwise.

See "Coming Events" page for details on August activities.

Fri 14th August, 7.30pm
Meeting (Zoom) "The delicate world of plume moths"
Speaker: Donald Hobern

Sat 15th August, 1.30pm
Excursion: "ANZAC Hill walk, Maldon"
Leaders: Phil & Judy Hopley

Mon 17th August, 9.00am
Roadside clean-up
Meet Tait's Decorative Iron, corner Willy Milly Rd & Pyrenees Highway.
Leader: Geoff Harris

Fri 11th September, 7.30pm
Meeting (Uniting Church Hall) "Birds and litter"
Speaker: Hannah Faraone (Federation Uni)
Combined meeting with Birdlife Castlemaine District and Connecting Country Feathery Festival.

Sat 12th September, 1.30pm
Excursion: "Proposed Loddon River Nature Trail, Guildford"
Leader: Bill Sampson

Visitors are welcome at club activities

Castlemaine Field Naturalists Club Inc. #A0003010B

castlemainefieldnaturalists.org.au

castlemainefnc@hotmail.com

PO Box 324, Castlemaine, 3450

Membership – fees due 1st April
Includes the monthly newsletter, Castlemaine Naturalist.
(Membership forms on CFNC website)
Single \$35, Family \$50
Pensioner or student:
Single \$25, Family \$30

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Email items: newsletter.cfnc@gmail.com
September edition deadline: **28th August**

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Euan Moore (0407 519 091)
Vice-President: Peter Turner
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The Nodding Greenhood Pterostylis nutans is the club emblem. Design by Rita Mills

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