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INSIDE THIS ISSUE!

- 1 ECA Office Bearers 2019—2020
- 1 Message from the President
- 6 Photo Competition
- 6 Euroky Large-eared Pied Bat and Underground Minimg
- 5 Euroky Cautionary Tale Regarding Allbats Filter
- 8 Upcoming events
- 8 Membership report
- 8 Recent Literature
- 11 ECA Notes of DPIE / ECA NSW Consultation Meeting, Biodiversity Offsets Scheme, 2 April 2020
- 15 What influences road mortality rates of Eastern Grey Kangaroos in a semi-rural area?
- 17 Dr Martin Denny: Honorary Fellow (Lifetime Member) of the Ecological Consultants Association of NSW.
- 20 Desert Caves—An unrecognised Resource.
- 25 Advertising with the ECA
- 25 Contributions to the Newsletter, Volume 45
- Back cover ECA Photo Gallery

Editor: *Brian Wilson* Design and Layout: *Amy Rowles*



Uncurling New Zealand fern frond.

The koru is a spiral shape based on the appearance of a new unfurling silver fern frond. It is an integral symbol in Māori art, carving and tattooing, where it symbolises new life, growth, strength and peace.

Photo courtesy of Amy Rowles

Front Cover Photo: Swainsona behriana

Courtesy of Isaac Mammot

ECA Office Bearers 2019-2020

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ECA COUNCIL MEETINGS

The ECA Council meet every three months to discuss and deal with any current business of the association. Any member who wishes to view the minutes from any of the ECA council meetings may do so by contacting the Administration Assistant Amy Rowles <u>admin@ecansw.org.au</u>

Message from the President

Dear Members,

I've had a lot of strange experiences in my life, but I never thought in my wildest dreams that I would be commenting as ECA President about two major crises that face us and the Australian environment, this season's bushfires and now the COVID-19 global pandemic. To coin an overused phrase, we really are living in unprecedented times.

Australian Bushfires

I know a few ECA members had a challenging Christmas/New Year break as a result of the NSW and Victorian bushfires, with properties put at risk and/or long-term monitoring sites burnt out. I'm sure that a few of you were also doing your bit as volunteer firefighters. As someone who spent all that time in relative safety in Sydney, I can only imagine the trauma that some of you have faced. Many of us cancelled holiday trips to the South and North Coasts and were blanketed with smoke that had drifted into towns and cities, but none of that would have compared with the challenges of being at the fire fronts. So, I extend my personal best wishes to those of you who were affected directly by the fires for a complete return to normal life (however long that may take), and give my thanks to those who fought the fires and helped bring them under control.

The bushfires devastated animal and plant populations and highconservation habitats across the country. But it is also heartening to see images of vegetation in early stages of regrowth in the post-fire period, and that there are remnant populations of plants and animals that survived the fires. The challenge now is to ensure the ongoing recovery of those habitats, that remnant animal populations survive starvation, disease and predation and ultimately reproduce, for regrowing vegetation to not be overgrazed, and for whole ecosystems to regain full functionality and ecological balance.

A key first stage in the bushfire recovery process is the need to monitor flora and fauna populations and their habitats within burnt areas. Subsequent stages will require active environmental management. This will require a massive effort in terms of people and resources over a long period of time. In early-February, I wrote to DPIE and the NSW Environment Minister to draw their attention to the fact that ECA members can play a part in this process. I emphasised that there are several hundred of us spread throughout NSW, each with a set of skills, experiences and equipment, who can assist the government implement each of these stages. I haven't heard back from DPIE and the Minister yet, but the ECA committee that liaises with DPIE on Biodiversity Offset Scheme (BOS) matters will be raising this issue again when we meet on 2 April 2020.

Coronavirus (COVID-19) Pandemic

I am amazed at how quickly ecological consultants have adapted their work practices over the last few weeks of the COVID-19 pandemic. Social-distancing rules are being followed by people working at home instead of in a shared office. Workplace meetings are conducted through video and/or phone conferencing. Many consultants are also continuing their fieldwork by working alone or in small groups. When in groups, individuals travel to and from field sites in separate vehicles, maintain the minimum required social distance (1.5 m at the time of writing), use P2 face masks or equivalent, apply liberal amounts of hand sanitiser on an as-needed basis, and dispose of used masks, tissues and empty sanitiser bottles in plastic bags or sealed containers. If possible, you should also wash your hands as frequently as possible with soap and water, so throw in a few blocks of soap and a drum of water into the back of the truck before heading off to your field site.

If you are currently not taking all these precautionary measures (and any others that come into play between now and the publication of this article), then you need to now. I was astounded when I went to visit a client's office in the Sydney CBD on 16 March. NSW workers were already beginning to work from home and social-distancing rules had not long been introduced. There were fewer people on the ferry than normal as I travelled to and from the meeting, city streets were quite deserted, and roadside cafes had shorter queues. But it was if my client had not heard of the pandemic; I entered an open-plan office where about 100 employees were sitting almost shoulder -to-shoulder at their computers, the air-conditioning was on high, and soon after my arrival I was ushered to a small boardroom where I was greeted by five people, all of whom shook my hand. That was my last face-to-face meeting with clients and work colleagues since the start of the pandemic, and I sure hope that the company client that I visited on that day has changed its work practice.

Statistical modelling by researchers from the University of Sydney (Chang *et al.* 2020) predicts that the coronavirus outbreak in Australia will only be controlled if at least 80 percent of the population observes the social-distancing and stay-at-home rules, and international travel is stopped (Figure 1). If 90 percent of the population observe the rules, then the outbreak will be contained within 13-14 weeks, longer if it is closer to 80

percent. This further highlights the importance of everyone keeping their distance and staying at home for now.

How every single Australian's actions affect the spread of coronavirus

To effectively slow the spread of coronavirus, the vast majority of people will need to cut out nearly all their in-person social interactions, new University of Sydney modelling shows. That's on top of existing measures like travel restrictions.



Figure 1 Modelled incidence of COVID-19 in Australia under different social isolation regimes.

Economic Downturn

The Commonwealth Government announced the second stage of its economic stimulus package on Sunday, 22 March 2020. It's likely that most, if not all, ecological and environmental consultancies (sole traders and small businesses) will be facing challenging times economically over the next few months as a result of the COVID-19 outbreak and the broader downturn in the global economy. The latest government package announces some measures that should help us get through these times. The following Treasury document outlines ways in which you and your businesses may be eligible for financial assistance:

Support for Businesses https://treasury.gov.au/coronavirus/businesses

Key highlights of this package that are relevant to ecological consultancies (sole traders and small- and medium-sized businesses) include:

- Small Business Cash Payment: Small businesses will be given a cash payment of between \$20,000 up to \$100,000 to keep their staff employed during the coronavirus crisis. This will also be available for not-forprofits. The payments will be delivered by the ATO as a credit on activity statements due from the 28 April 2020 onwards.
- 2. Unsecured Loans: With companies reluctant to borrow, the Commonwealth is also offering to guarantee unsecured loans of up to \$250,000 for a term of up to three years. *This will commence by early April 2020 and be available for all new loans until 30 September 2020.*
- **3. Welfare Payments:** In addition to the \$750 payment for welfare recipients announced previously, an additional \$750 payment will be paid to social security and veteran income support recipients and eligible concession card holders. *The first payment has been marked for 31 March 2020 and the second payment due for the 13 July 2020.*
- **4. Superannuation Access**: Individuals feeling the financial stress of coronavirus can gain access to \$10,000 of their superannuation tax free in 2019-20 and a further payment in 2020-21. A total of \$20,000 will be available over the coming months. **No tax will be imposed on withdrawals. Applications will be available from April 2020.**
- **5. Superannuation Withdrawals**: There is now some flexibility in relation to retirees drawing down on their superannuation monies. Normally, a minimum of 4% of your account balance must be withdrawn, this has been halved to 2% for the 2019-20 and the 2020-21 financial years.
- **6. Bankruptcy Relief**: The package also announced changes to the bankruptcy rules & various definitions under the Corporations Law. These changes are designed to not put immediate pressure on directors and business owners.
- 7. Deeming Rates. The social security deeming rates have now been lowered in response to the low interest rate environment. This will take effect from the 1 May 2020.
- 8. Income Support for Individuals: The Government is temporarily expanding eligibility to income support payments and establishing a new, time-limited Coronavirus supplement to be paid at a rate of \$550 per fortnight. This would be paid to both existing and new recipients of the eligible payment categories. This will take effect from 27 April 2020.

September 2020. At the centre of this package is a \$1,500-per-fortnight Job Keeper payment for employees of

businesses who have lost 30 per cent of income (or 50 per cent for businesses with annual earnings of \$1 billion). The employer pays the employees this flat rate, provided they were on the books as of 1 March 2019, and the Government would reimburse those businesses. This would mean all environmental consultancy businesses that have been operating over the last year would be eligible. Businesses are eligible to use these payments for full-time and part-time workers, casual employees who have been with their employer for at least 12 months, sole traders and New Zealanders on 444 visas. JobKeeper payments will become available in the first week of May and backdated to 30 March 2020.

Businesses who wish to take part in the JobKeeper payment scheme must register their interest in receiving information updates at the Australian Tax Office JobKeeper Payment page: <u>https://www.ato.gov.au/general/gen/JobKeeper-payment/</u>.

Other ECA Deliberations

All ECA NSW members should have received an information email on 17 March 2020 that described ongoing ECA Council activities and changes to the ECA program of events in response to the COVID-19 outbreak. An update to that information so far is that the Council is now working towards having the annual conference, annual general meeting (AGM) and workshop in November, but this may be put back even further if the coronavirus outbreak is not contained by then. In the meantime, we are attempting to update members with other developments through regular ECA Information Emails and frequent (almost daily) posts on the ECA Facebook Page <u>https://www.facebook.com/NSWECA/</u>.

Thanks to Isaac Mamott for offering to step onto the ECA Council to fill one of the vacancies left the departure of Steve Bloomfield and Kate Hammill. The Council accepted Isaac's offer and he joined the Council on 25 March 2020 until the time of the next AGM.

In addition to meeting with DPIE, the ECA NSW has had a seat at the Commonwealth Department of Energy Environment (DEE) table over the last couple of years, along with other environment industry groups. These meetings occur in Canberra twice a year (usually in February and August); Belinda Pellow was the initial representative of ECA NSW, but Andrew Lothian has taken over this responsibility over the last two meetings. The main purpose of these meetings is to keep the environment industry up-to-date with proposed and actual policy, legislative and administrative changes to the EPBC Act. It is also an opportunity for environment industry groups to provide DEE with advice about how the EPBC Act affects the industry and to suggest future environmental and industry provisions. Andrew publishes a summary of outcomes from those meetings in *Consulting Ecology*.

It has been challenging for the ECA Council to respond to all calls for reviews of government inquiries, documents and proposals. This will remain an issue unless the ECA's broader membership steps up and accepts some of this responsibility. There is a limit to what additional work the Council can take on (a perennial problem for all professional associations and societies) and, if other ECA members don't contribute to these reviews, then there is a good chance that they will not get done. Two government document reviews that the ECA has participated in recently are DPIE's *Threatened Plant Survey Guide* (thanks to Belinda Pellow) and *Threatened Frog Survey Guide* (currently being reviewed by Narawan Williams). The ECA Council is also preparing a submission into the review of the EPBC Act.

A much slower project that the ECA Council has been working on, courtesy of Narawan once again, is a speciesspecific guide to nest box design and use. This is based on information that came out of the ECA Nest Box Workshop held in July 2019, as well as additional data that have been collated by Narawan. We hope to load this information onto the ECA website shortly. There is likely to be a few gaps in information and one of the purposes of loading this advice on the website is to encourage others to help fill some of these gaps.

Well, that's all the news for now. It's been a very challenging start to 2020 and I'm sure that the challenges will keep coming. But I think we are very fortunate to be in an extremely varied and informative profession that takes us to interesting places, provides us with exciting experiences, and (hopefully) a sense of achievement as we assist in managing impacts of human activity on the natural environment. Over the last week or so, I have been entertained by some ecological consultants sharing their memories on industry online platforms of field trip experiences, both from the distant past and more recent times. It has spurred me to recall some of my own field experiences which now extend back nearly 40 years. So, if you ever need a bit of cheering up or stressing down, perhaps engage in a bit of memory recall of your own and I can guarantee you'll feel a lot better!

Dr Stephen Ambrose ECA NSW President 31 March 2020

Reference

Chang, S.L, Harding, N., Zachreson, C., Cliff, O.M. and Prokopenko, M. (2020). Modelling transmission and control of the COVID-19 pandemic in Australia. Unpublished online report, University of Sydney <<u>https://arxiv.org/pdf/2003.10218.pdf</u>, last viewed 27 March 2020>

EUROKY

Euroky: ability of an organism to adapt to changes in the environment

If you have any interesting observations or useful hints and information that you would like to share in the euroky column, please forward them to the newsletter editor or administration assistant to be included in the next edition.

LARGE-EARED PIED BAT AND UNDERGROUND MINING



Yerrinbool Long-tailed Bombyx Trichiocercus sparshalli. Photo courtesy of Rebecca Hogan.

Andrew Lothian

I have been working for a number of years on a project looking at cave-roosting bat species and underground mining. The site has numerous sandstone clifflines, and good numbers of Large-eared Pied Bat, Large Bent -winged Bat and Eastern Horseshoe Bat either inhabiting and/or feeding along these clifflines. From Before-After Control-Impact (BACI) statistical analysis there is evidence to suggest that activity of these species has declined significantly after undermining, and the decline is greater than any seen in control areas. Please be on the lookout for such phenomena at any sites you may be working on. I would be happy to discuss project design with anyone.



If you have 2nd hand ecological equipment that you would like to sell or would like to purchase you can place an ad in this newsletter. Free for members or \$40 for non -members. Contact admin@ecansw.org.au.



CAUTIONARY TALE REGARDING ALLBATS FILTER

Andrew Lothian

With the advent of the Titley Bat Call analysis workshops, a lot more consultants are looking at their own bat calls. Some may be doing full analysis, while others are simply cleaning out the junk to make someone else's job easier. Those who have done the course would be aware of the "Allbats Filter" which aims to help cut out the noise files and make analysis easier. Please remember to check these files before you delete them. Some species have particularly weak calls that can be accidentally (and unknowingly) removed from analysis. The consequences of this may not seem huge, except that one of these species is listed as Threatened and presence can trigger further detailed survey under survey guidelines (Large-eared Pied Bat). As such, there is need to actually look at *all* the calls recorded on your device. The following is an example of how the Allbats Filter works on one common and one threatened species. Also, depending on the version of Analook you might be using, once you

apply the filter and tag the file with a species label and move to the next file, you cannot undo the filter. For this reason, it is good practice to go through your files prior to using the filter.



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UPCOMING ECA EVENTS

ECA ANNUAL CONFERENCE

Date: 2-3 November 2020Biodiversity Conservation Act and Restoring offset sites: VMPs and Best PracticesLocation: Sage Hotel, Wollongong

PROPOSED FUTURE ECA WORKSHOPS

Orchid Workshop
 Date: August 2021
 Location: TBA
 Register your interest: admin@ecansw.org.au

eDNA Workshop
 Date: 2021
 Location: TBA
 Register your interest: admin@ecansw.org.au

 Vegetation Community Workshop—allocating PCT's
 Date: 2021
 Location: TBA
 Register your interest: admin@ecansw.org.au

ECA Membership Report

In total we have 192 members, comprised of 133 Practising Ecological Consultants, 20 Early Career Ecological Consultants, 25 Associate (Government Ecological/ Environment Officer), 7 Associate (Nonpractising), 1 Associate (Subscriber) and 4 Students. We currently have 3 applicants and have 7 new members and they are introduced below:

- Alexander Graham (Practising Ecological Consultant)
- Jai Green-Barber (Early Career Ecological Consultant)
- Harriet Gabites (Early Career Ecological Consultant)
- Coral Pearce (Early Career Ecological Consultant)
- Holly Cope (Early Career Ecological Consultant)
- · Danielle Adams-Bennet (Associate Government)
- Natalie Edmonds (Associate Government)

RECENT LITERATURE AND NEW PUBLICATIONS

WHITLEY ZOOLOGY BOOK AWARDS, 2 OCTOBER 2019

Dr Stephen Ambrose Principal Ornithologist, Ambrose Ecological Services Pty Ltd. Member Whitley Committee Royal Zoological Society of NSW

The Royal Zoological Society of NSW's Whitley Awards were held at the Australian Museum in Sydney on 2 October 2019. These awards are held annually and recognise the best Australasian zoology books that have been published over the previous 12 months. Both the authors and the publishers of the books are recognised by the Whitley Awards.

About 40 zoology books were judged by the Whitley Committee this year, and 11 of these were given a Whitley Award. Those that received awards are shown below and may assist ECA members with their ecological consultancy work, or simply for their families to enjoy. Transcripts of the presentation and acceptance speeches from the Whitley Awards night, which explain why each book received a Whitley Award will appear in a future edition of the Royal Zoological Society of NSW journal, *Australian Zoologist* <u>https://www.rzsnsw.org.au/rzs-nsw-publications/</u> <u>australian-zoologist</u>.

Whitley Medal

Zobi and the Zoox: A Story of Coral Bleaching By Ailsa Wild, Aviva Reed, Briony Barr and Gregory Crocetti CSIRO Publishing

Highly Commended

Secret Lives of Carnivorous Marsupials By Andrew Baker and Chris Dickman (CSIRO Publishing)

Young Children's Book

Leonard the Lyrebird By Jodie McLeod (King Street Press) **Children's Book** *The Great Lizard Trek* By Felicity Bradshaw and Norma MacDonald (CSIRO Publishing)

Young Naturalist

Faunaverse: Wildlife in Poetry By Alexander and Jane Dudley (Faunaverse)

Field Guide

Reptiles and Amphibians of New Zealand: A Field Guide By Dylan van Winkel, Marleen Baling and Rod Hitchmouth (Auckland University Press)

Natural History

Reptiles of Victoria: A Guide to Identification and Ecology By Peter Robertson and A. John Coventry (CSIRO Publishing)

Zoology Guide

A Guide to Native Bees of Australia By Terry Houston (CSIRO Publishing)

Conservation Biology

A Bat's End: The Christmas Island Pipistrelle and Extinction in Australia By John Woinarski (CSIRO Publishing)

Historical Zoology

Australia's First Naturalists: Indigenous Peoples' Contribution to Early Zoology By Penny Olsen and Lynette Russell (National Library of Australia)

Biological Resource

Australian Bryozoa Volume 1: Biology, Ecology and Natural History Volume 2: Taxonomy of Australian Families Editors: Patricia L. Cook, Philip E. Bock, Dennis P. Gordon and Haylee J. Weaver (CSIRO Publishing and ABRS)

Dr Stephen Ambrose

Recent Book Releases Information Source: CSIRO Publishing Website http://www.publish.csiro.au

Title: <u>The Future of the Fringe</u>

Author: Michael Buxton, Andrew Butt RRP: \$59.99 No. Pages: 184 Publisher: CSIRO Publishing Date: April 2020 Explores the history, policy and practice surrounding peri-urban areas, as well as their value.



Peri-urban landscapes are some of the world's most vulnerable areas.

Although they are often thought of simply as land awaiting development, these landscapes retain important natural resources and make valuable contributions to agriculture, water use, biodiversity conservation, landscape preservation and human well-being. Billions of people use them and enjoy their natural values. Their continuing loss threatens to alter our relationships with nature and have a negative impact on the environment.



Title: <u>Field Guide to the Frogs of Australia</u> Author: Michael Tyler, Frank Knight RRP: \$49.99 No. Pages: 208 Publisher: CSIRO Publishing Date: March 2020 *Covers the 248 native and 10 non-native frog and toad species found in Australia. Throughout much of the world, frog populations are declining, with the survival of many species under threat. In Australia,*

several species have become extinct in the past 35 years.

Frogs and Reptiles of the Murray-Darling Basin



Title: Frogs and Reptiles of The Murray-Darling Basin: A Guide to their Identification, Ecology and Conservation Author: Michael Swan RRP: \$49.99 No. Pages: 352 Publisher: CSIRO Publishing Date: February 2020

MICHAEL SWAN

A comprehensive guide to the 310 species of frogs and reptiles living in the Murray–Darling Basin. The Murray–Darling Basin spans more than 1 million square kilometres across the lower third of Queensland, most of New South Wales, the Australian Capital Territory, northern Victoria and the south-eastern corner of South Australia. Wildlife habitats range from the floodplains of the Basin to alpine areas, making the region of special ecological and environmental interest.

Title: <u>Hawkmoths of Australia:</u> <u>Identification, Biology and</u> <u>Distribution</u> Author: Maxwell Moulds, James Tuttle and David Lane RRP: \$220 No. Pages: 424 Publisher: CSIRO Publishing



Date: January 2020

An essential reference to all hawkmoth species found in Australia and on its offshore islands.

Hawkmoths are large charismatic insects with highly variable and colourful larvae. Some species are specialised in their habitat preferences, but others are widespread and often encountered in gardens. However, little is known about most species, and associating the adults with their larvae has previously been difficult or impossible.

Title: <u>The Action Plan for Australian Lizards and</u> <u>Snakes 2017.</u>



Author: David Chapple et al RRP: \$160 No. Pages: 680 Publisher: CSIRO Publishing Date: December 2019 *Comprehensive conservation status assessments of 986 species of Australian lizards and snakes. Lizards and snakes (squamate reptiles)*

are the most diverse vertebrate group in Australia, with approximately 1000 described species, representing about 10% of the global squamate diversity. Squamates are a vital part of the Australian ecosystem, but their conservation has been hindered by a lack of knowledge of their diversity, distribution, biology and key threats. Title: <u>Underwater Sydney</u> Author: Inke Falkner, John Turnbull RRP: \$39.99 Publisher: CSIRO Publishing Date: September 2019 *Celebrates Sydney's harbour and*



coast through eclectic stories and underwater photography. Admired all over the world and loved by locals for its natural beauty, Sydney Harbour is enjoyed by thousands of people every day. But rarely do we look below the surface where, beneath all the hustle and bustle, lively communities go about their business. With underwater forests and gardens, hundreds of species of fish and thousands of invertebrates, Sydney is as colourful and diverse below the water as it is above!



Title: <u>Australian Bird Names</u> Author: Ian Fraser, Jeannie Gray RRP: \$54.99 No. Pages: 368 Publisher: CSIRO Publishing Date: September 2019 *An entertaining account of the stories behind the names of Australian birds.*

This second edition of Australian Bird Names is a completely updated checklist of Australian birds and the meanings behind their common and scientific names, which may be useful, useless or downright misleading!

ECA NOTES OF DPIE / ECA NSW CONSULTATION MEETING, BIODIVERSITY OFFSETS SCHEME, 2 APRIL 2020

A delegation of the ECA Council met with representatives of DPIE on 2 April 2020 to discuss issues related primarily to BAM and biodiversity offsetting. The ECA Council and DPIE have an agreement to meet every 3 to 6 months to discuss these issues. Previous meetings have been held at the OEH / DPIE office, but the April meeting was a Skype session in line with COVID-19 workplace restrictions.

The following notes are compiled by the ECA delegates for information of ECA members. They represent only the ECA's perspective of the meeting, and should NOT be regarded as the official minutes. The notes are also supplemented with additional written information provided to the ECA by the DPIE after the meeting.

Date and Time: Thursday, 2 April 2020. 2.00-3.30 pm

Present: Derek Rutherford (DPIE), John Seidel (DPIE), Lucian McElwain (DPIE), Merrin Tozer (DPIE), Stephen Ambrose (ECA), Alison Hunt (ECA) and Belinda Pellow (ECA).

1. Draft Complaints/Feedback Policy (DPIE)

DPIE has compiled a Draft Complaints and Feedback Policy document that outlines the process for investigating filed complaints against individual Accredited BAM Persons. The draft is going through internal approvals before comment will be sought from Accredited BAM Assessors, industry groups such as the ECA NSW, and local government. The draft policy should be available for review at the end of May.

The 10-page draft policy includes a flow-chart. The policy focuses on Level 1 policy to complaints.

a) Level 1 - Appeals: lodgement and logging of complaints; DPIE investigation of the complaint; determination, executive approval and notification of actions required; right of appeal by the person who is the subject of complaint.

There are two other levels of response:

- b) Level 2 Audit: auditing of BAM data and reports of person who is the subject of complaint. The Audit Team of the BOS works closely with the relevant local council in conducting the audit. It has access to Level 1 information.
- c) Level 3 Formal Compliance: When a complaint has alleged that an Accredited BAM Assessor has provided false and misleading or has breached other parts of the BC Act. The Compliance team has access to all the required information.

Existing complaints are being investigated using the Draft Complaints/Feedback Policy.

The ECA reiterated its earlier proposal that the BAM Accreditation Panel needs to have at least one representative from the ecological consulting industry (preferably the ECA NSW as the principal industry group representing ecological consultants in NSW) and local government. This would help reduce the risk of unsuitable people becoming accredited and subsequently be subjected to a complaint investigation. The DPIE noted that any potential conflict-of-interest would need to be managed, but it will consider this proposal in determining processes for reaccreditation.

The ECA also pointed out that concerns have been raised by ECA members of a potential conflict-of-interest when BAM-accredited DPIE employees work concurrently in the ecological consulting industry. This would particularly be so if they are involved in policy development or administration of the BOS.

2. BAM Accreditation Renewal

Existing BAM accreditation will be extended by 12 months to allow Accredited BAM Assessors more time to conduct BAM assessments and in the light of the COVID-19 pandemic.

DPIE is currently considering introducing different categories of accreditation. One possible model under consideration:

- a) Accredited Ecologist/Practitioner: A person who conducts BAM assessments and writes-up reports.
- b) Reviewer of BAM reports (reviews reports, but not accredited to conduct BAM assessments), e.g. council officers and DPIE staff.

Another potential model being considered would use categories similar to those in the former Native Vegetation Scheme.

The ECA and Accredited BAM Assessors will be consulted in the development of these categories.

3. Continuing Professional Development

Evidence of ongoing professional development will be essential for re-accreditation. Guidelines are currently being developed by DPIE. This requirement will apply from the time the guidelines are introduced (probably in 2021) and will not be backdated or retrospective. DPIE acknowledges the feedback that the proposed annual field work components may not be practical for some existing assessors.

The ECA and Accredited BAM Assessors will be consulted in the development of these categories before it is introduced.

4. Training Content Review

DPIE is revising its BAM training program and developing its renewal training program based on feedback from Accredited BAM Assessors, local government and industry groups such as the ECA.

In terms of initial training, DPIE has decided to present future training under the five one-day modules of the original training program. However, DPIE has acknowledged that there is a requirement for greater emphasis of the practical component of BAM training, i.e. field data collection and use of the credit calculator. DPIE is currently investigating how this can be achieved and is considering a course that may more closely resemble the format of the former BioBanking training program. DPIE is also investigating the feasibility of delivering the training online.

A renewal training program is in its early stages of development by DPIE.

5. BOS Website Review

DPIE is significantly upgrading the BOS website. The new version should be online later this year. First changes are planned for mid-year. ECA and DPIE agreed that the current version is too complex, difficult to find relevant information, especially if one has gone down the wrong "rabbit hole" (i.e. following the wrong thread).

DPIE agreed in principle to provide a link to the ECA NSW Certified Practising Ecological Consultants (CPEC) Scheme on the BOS website. The CPEC Scheme certifies consultants who have the qualifications, skills and business requirements to conduct broader ecological consultancy work.

The ECA indicated that the type of information required by a consultant is often different to that of others using the BOS website. Feedback from consultants would allow DPIE to tailor a section of the website to consultant needs and remove other information links that confound the process.

6. BAM Implementation Program Delivery Update

DPIE has conducted its internal review of the submissions received from public exhibition of the BAM and will soon submit the outcomes of the review to the Environment Minister. The ECA was not invited to be part of the review process, despite DPIE flagging the possibility of this happening when the ECA last met with them in

December 2019. DPIE received only a small number of submissions from assessors in response to public submission of the proposed changes. In finalising the proposed BAM, DPIE consulted with those assessors who made submissions on the proposed amendments, particularly in regards to the new module for assessing planted native vegetation.

Several guides are completed or are close to being completed and have been or are being reviewed by ecological consultants designated by the ECA Council. These are:

- a) Application of BAM to burnt sites Published.
- b) Threatened Flora Survey Guidelines Will be published in the second week of April 2020.
- c) Threatened Frog Survey Guidelines. The ECA noted that Narawan Williams is not able to undertake the review in the required timeframe and, if necessary, can find another suitable person to complete the task. DPIE noted there were sufficient reviewers for this guide, however ECA input for future guides will continue to be sought.

Future guides that are in earlier stages of production are:

- a) Threatened Bat Survey Guidelines
- b) Koala Survey Guidelines
- c) Threatened Bird Survey Guidelines (in collaboration with BirdLife Australia).

DPIE has published a viewer that allows assessors to access the Important Habitat Area Map. Access previously required a request to the BAM support mailbox and accounted for 18% of enquiries by assessors. DPIE will continue to look for opportunities to provide assessors with direct access to information and tools that help assessors do their work.

DPIE also explained that the delivery of BAM webinars is progressing well and has a high participation rate. Written transcripts of questions and answers will be provided at the time that webinars are published online. This is in response to the requests of webinar participants for this information.

BAM-accredited members of the ECA consider that significant delays in responses to questions submitted through the BAM Support Mailbox remain a problem. The ECA pointed out that answers to submitted questions are required within 48 hours because of the tight time-frames, e.g. when preparing fee proposals for prospective clients in which there is no room for a delayed response. The ECA pointed out that an easily-located access point for questions that have already been answered might reduce the workload in maintaining the mailbox.

DPIE has reworked how it provides support to assessors on a day-to-day basis. While acknowledging the desire for a 48-hour turnaround, DPIE has observed improvement in this area, particularly with a fall in the number of enquiries per week from 5.6 to just over 4, reflecting the improved engagement with assessors through webinars, forums and publication of FAQ's, supporting guides and practice notes, etc. The average response time of 7 days reflects that it receives enquiries that are readily answered and other enquiries that are complex and take much longer than average. These include enquiries related to technical systems support.

Additional information provided by DPIE subsequent to the 2 April meeting:

DPIE has also published a range of FAQ's available from the <u>assessor resources page</u>. Assessors have been notified of this resource via the regular assessor updates. Similarly, questions asked during the webinars are also published with the webinar. Please let us know if there are additional FAQ's that may assist with preparing fee proposals.

The BAM Support Mailbox commenced on 19 August 2019, and as of early February:

• The BAM Section of DPIE has received around 520 enquiries, which comes in at an average of just over four

emails per day (compared with an average of 5.6 LMBC enquiries).

- To date they have responded to over 90% of enquiries, with an average response time of seven working days.
- The top three topics are about:
 - □ 25% of queries are for technical systems support, relating to BAMC, BOAMS and the BOPC (down from about 37%).
 - 18% of queries Important Mapped Habitat, seeking to determine if a site is on a mapped important habitat area for the Regent Honeyeater or Swift Parrot (an increase which should drop with the release of the viewer); and
 - □ 16% are for BAM / BDAR Requirements (no specific data to compare).

7. PlantNet and NSW Flora Online

The ECA urged the BOS Unit to provide moral support for the RBG's PlantNet and NSW Flora Online. They are essential resources for BAM assessors and ecological consultants and need to be kept online and updated to reflect taxonomic and other changes. DPIE agreed that it is an essential resource and that they would do whatever they can to convince the RBG to maintain this online resource.

8. Ecological Monitoring of Burnt Areas

The ECA encouraged the DPIE to use ECA NSW members to monitor the recovery of animal and plant populations, and their habitats, in areas that were burnt during the bushfire season. It was pointed out that the ECA NSW comprises consultants who are skilled and experienced at monitoring flora and fauna and their habitats, data management and analysis, and environmental management. Collectively, the ECA membership has a lot of monitoring equipment. Such collaboration would also assist the ecological consulting industry, which could face some significant challenges over at least the next 6-12 months as a result of the COVID-19 pandemic and the associated economic downturn.

9. Next Meeting

Tentatively scheduled for July 2020

Kind regards, Stephen

Dr Stephen Ambrose President, Ecological Consultants Association of NSW Inc.



WHAT INFLUENCES ROAD MORTALITY RATES OF EASTERN GREY KANGAROOS IN A SEMI-RURAL AREA?

Jai Green-Barber

Roads have multiple ecological impacts on wildlife, including; habitat fragmentation, isolation of populations, and noise disturbance however, the most commonly and easily observed impact is road mortality. Wildlife are attracted to roadsides by resources that are rare or limited in other areas, such as water and high quality foods. Urban development reduces available habitat, and therefore roadside vegetation provides a significant proportion of suitable habitat in modified landscapes. Large herbivores are particularly sensitive to habitat fragmentation because they need unrestricted access to large continuous habitat. As Australia's largest native terrestrial herbivore, it is no surprise that Kangaroos account for a large proportion of wildlife vehicle collisions. It has been estimated that over 9 million kangaroos and wallabies are killed annually on Australia's roads that stretch across 810,600 km.

Landscape features surrounding the road influence the likelihood of road mortality occurring, and can sometimes result in roadkill hotspots. Roadkill hotspots are areas with a higher rate of wildlife vehicle collisions than other surrounding areas. Hotspots may result from resources or attractive habitat features that occur close to the roadside, or when two particularly valuable resources occur on opposite sides of the road causing animals to cross frequently. Temporal factors such as season and time of day can also influence the likelihood of a wildlife road mortality occurring. In a world of ever expanding urban development, it is crucial to consider ways to improve future road design and habitat connectivity to reduce the incidence of wildlife vehicle collisions.

My research investigated a roadkill hotspot located in Richmond NSW. Roadkills involving eastern grey kangaroos (*Macropus giganteus*) occurred regularly at this hotspot throughout 2014-2015. I compared the landscape features where roadkills occurred, with the landscape features in surrounding areas where no roadkills were observed, to see which factors contribute to the location of kangaroo roadkills. Climatic data were also compared between dates when roadkills did and did not occur to examine which factors contribute to the timing of kangaroo roadkills. The main findings of this study are outlined below.

1. Illumination plays a big role in kangaroo road mortalities;

Night time illumination levels on roads are varied due to the presence or absence of artificial street lighting. The location of street lights is likely to





2. The location of resources can influence where kangaroos cross roads;

Slightly more kangaroo road mortalities occurred in areas with a woodland habitat on one side of the road, and grassland habitat on the other side. Kangaroos utilise a variety of habitats and regularly leave heavily wooded areas to access grassland habitats, therefore if different resources occur on either side of a road, then kangaroos are more likely to cross that road.

3. Fences act as barriers, limiting the direction in which kangaroos disperse;

More kangaroo road mortalities occurred near wire cattle fences than other fence types. Wire cattle fences are easier for kangaroos to pass through, making it easier to access the road and roadside areas at these locations. Inconsistencies in fencing along road sides can funnel animals to cross roads in the areas where it is easier to pass through. Problems also occur when the fence on one side of the road allows kangaroos to pass through easily and enter the road area, but the fence on the other side of the road is more difficult for the kangaroos to pass through and may effectively trap them on or near the road.

4. Winter is the most high risk period for kangaroo road mortalities;

Most kangaroo road mortalities occurred during winter, perhaps due to a decrease in food availability and nutritional value causing kangaroos to travel further and cross roads more frequently to access resources over a wider area. Winter also has less hours of daylight, which is likely to result in an increased number of vehicles on the road outside daylight hours, and may also lead to extended hours of activity for nocturnal and crepuscular species of wildlife such as kangaroos.

5. Suggested strategies that can be used to minimise the likelihood of kangaroo road mortality include;

- Street lighting should aim to be uniform where practicable and not create gaps where wildlife will be funnelled into areas of lower visibility.
- Temporary flashing signs can be used to warn drivers of the increased kangaroo activity during high risk periods such as the waning gibbous lunar phase.
- Fencing should be uniform, or placed in a way to strategically funnel kangaroos to desired crossing areas such as constructed underpasses or overpasses.

This research was published in the following paper in BMC Zoology on the 17th December 2019;

Green-Barber JM, Old JM (2019). What influences road mortality rates of eastern grey kangaroos in a semi-rural area? BMC Zoology, vol. 4, no. 1, pp.1-10. doi:10.1186/s40850-019-0047-8





DR MARTIN DENNY: HONORARY FELLOW (LIFETIME MEMBER) OF THE ECOLOGICAL CONSULTANTS ASSOCIATION OF NSW INC.

Dr Stephen Ambrose

At its September meeting, the ECA NSW Council agreed to award Dr Martin Denny an Honorary Fellowship (i.e. Lifetime Membership to the Ecological Consultants Association of NSW Inc), the first of its kind in the Association's history. This is in recognition of his outstanding long-term contributions to the Association and for promoting high standards within the ecological consultancy industry.

On 26 October 2019, nineteen people attended a special luncheon at Lachlan's Old Government House at Parramatta Regional Park to present Martin with this award. It was an opportunity for some of Martin's close friends and colleagues to celebrate his achievement, share some anecdotes and photographs from the past, and to hear our Honorary Fellow talk briefly about his career and the history of the ECA NSW.

Even though many people have contributed a lot to the ECA over the years, Martin has contributed more than others, over the 23 years of the Association's history. He is the only member who has completed two terms as the ECA NSW President and he served on the ECA Council for most of the Association's history. During that time, he provided leadership, vision and encouragement that has led to what is now a vibrant and focused or-ganisation that works hard to meet the needs of its members, he has been a strong advocate for developing industry standards in ecological consultancy in NSW, and has helped establish strong ties between the ECA and the NSW Government.

In pushing for high industry standards, Martin worked voluntarily on government committees, as an ECA representative, to provide input into the development of biodiversity survey guidelines, government and industry accreditation of ecological consultants, and scientific licencing in NSW. He was also on the accreditation panel for the former NSW BioBanking Scheme. After Martin completed his second term as ECA President, he remained on Council and immediately accepted the role as the Chair of the ECA's Certification of Practising Ecological Consultants Panel. And very recently, he was a member of the ECA delegation that met with the government to discuss the current biodiversity offset scheme.

Martin also provided advice and encouragement to ecological consultants in Victoria when they were establishing their own association. Closer to home, he has been a wise mentor to all who have followed in his footsteps as President, and to those who have hopped onto the ECA NSW Council for the first time.

Martin has been a regular contributor to the ECA journal, *Consulting Ecology*, providing everything from opinion pieces about ecological consultancy through to an article on human consumption of Coconut Crabs on the Cook Islands!

At the 2019 AGM he initially stood for another term on the ECA Council, but in an act of generosity withdrew his nomination to allow others to have their say and lead the ECA NSW into the future.

With this impressive record of achievement (and he's made it all look so easy, when it isn't), the ECA Council had no hesitation in awarding Dr Martin Denny the inaugural Honorary Fellowship to the Ecological Consultants Association of NSW.



ECA NSW President, Stephen Ambrose arrives early at Old Government House in Parramatta Regional Park to help set up the function room where Martin's lunch was held.



Stephen Ambrose talking about Martin's ECA NSW legacy.



Martin Denny talking about his career and the history of ECA NSW





Guests at the luncheon waiting for food to be served and formal proceedings to begin.





A group shot of Martin Denny with ECA NSW members who attended the luncheon

Martin showing his gratitude to his protégé and ECA Treasurer, Andrew Lothian.



Some of us felt it was more appropriate to accept a handshake from our Honorary Fellow



DESERT CAVES- AN UNRECOGNISED RESOURCE

Martin Denny

Caves are mostly thought of in terms of guided tours through decorative formations or as sources of prime-evil horror. However, caves provide a home for a large number of organisms that are dependent upon their unique conditions, and other organisms that exploit such conditions to survive.



But what is a cave? The Australian Speleological Federation Inc. defines "a CAVE as a natural cavity in rock large enough to be entered by man". Thus a cave does not need to be a deep complex of tunnels, rather it can be a large overhang or a short tunnel in the side of a cliff. Such features are not restricted to the coastal and mountainous parts of Australia. Caves and deep overhangs form part of the landscape in the Australian arid zone.

Most caves within the eastern part of NSW are considered as Karst, and the NSW NPWS provide a Guide to New South Wales Karst and Caves, giving a map of their locations. According to Wikipedia Karst is a topography formed from the dissolution of soluble rocks such as limestone, dolomite, and gypsum. It is characterized by underground drainage systems with sinkholes and caves. The NPWS Guide shows that the locations of karst formations are all east of Dubbo i.e. there are no documented cave systems in the inland of NSW.

Most caves and karst form by solution of limestone/dolomite, and these are the ones that are found within eastern NSW. But caves also form in a variety of non-carbonate rocks, both by solution (parakarst) and other mechanisms (pseudokarst).

Pseudokarst is a terrain with landforms which resemble those of karst but which are not the product of karst processes. This concept has changed over the years so that pseudokarst caves can be considered as forming from dissolution of non-carbonate rocks e.g. siliceous rocks and/or by erosion.

Thus Pseudokarsts are landscapes with morphologies resembling karst, and/or may have a predominance of subsurface drainage through conduit-type voids, but lack the element of long-term evolution by solution and physical erosion.

| A "typical" Deep Weathering Profile | | | | | |
|-------------------------------------|--------------------------|---|--|--|--|
| | Top soil | Soft, usually sandy, porous | | | |
| | Duricrust | Very Hard, cemented by Fe, Si, Al | | | |
| | cave | Variable porosity = pisolites, pipes, tubes, vugs - or tight. | | | |
| | Mottled Zone 2-30m | Soft to firm, hardens on exposure. Variable porosity = tubes, vugs, & breccias. Mottled colour patterns variable, Rock structures obliterated | | | |
| | Pallid Zone 2-50m | Soft to firm, kaolinised, Low porosity. Pale colours. Rock structures still visible as ghosts | | | |
| +++++ | Bedrock | Hardness & porosity are determined by rock type | | | |

How do pseudokarsts form if not through olution of limestone/dolomite? A figure produced by Ken Grimes for his CD (Selected Australian Caves & Karst" gives an dea.

The surface of ground above a cave formation is composed of a very hard substance called duricrust, beneath which is a softer material. The duricrust is composed of silcrete and/or ferricrete and is of variable porosity due to pipes and tubes. It is this tough but brittle stone that is harvested and worked by aborigines to make stone tools such as spear points and knives. Over time water seeps through the duricrust and erodes tunnels and tubes in the softer layer (mottled zone), and the outer edge of the cliff exposes the eroded caves and overhangs. The leaching out of silicon during this process leads to the formation of opal.



Left: A typical group of caves and overhangs are shown in the mesa formation in western Queensland.

Below Left: The next picture shows an overhang and a tunnel beyond in a cliffline near Windorah, Queensland. Hard to see here, but the roof of the overhang is covered in paintings from the previous occupants. Although the tunnel may look small, many will descend more than 20 meters into pitch darkness.

Below: Some caves start small but open out once inside (cave near the Queensland/South Australian border)



What are the characteristics of these caves that make them so interesting, and so important to arid zone fauna? There are many, but differences in the environment between inside and outside the caves definitely drives their use by fauna.

I have been measuring the temperatures and humidity levels in several caves over many years, first using thermohydrograph, a cumbersome machine whose clockwork needed to be wound up every week and a pen nib filled with ink, but recently using a more modern iButton.

Here are graphs of temperatures and humidities taken over a summer period at a cave in Sturt National Park in 1975. First temperatures. This shows that the mean temperature outside the cave is about 31°C and at the entrance 32°C. Both these temperatures vary considerably but inside the cave it is a constant 25°C.

Humidity shows a reverse pattern i.e. humidity is lower outside and at the entrance to the cave with the inside humidity a relatively constant 80%. Again humidity varies considerably outside and at the entrance. The constant temperature and humidity inside caves is a good reason for their use to mature wines and cheeses.



2 Entrance 3 Inside

2D Graph 3

These graphs give the averages over time, but it is the pattern of differences between the temperatures and humidity inside and outside a cave during a 24 hour cycle that is most important to cave dwelling fauna.

Outside

20

0

Below is a graph of temperatures inside and outside the cave at Tibooburra in December 1975. This shows how at two periods of the 24 hour cycle the outside and entrance temperatures drop below that of the inside. In the next graph a similar pattern is shown for humidity i.e. the outside humidity is higher outside the cave on two occasions.

The two periods when the gradients of temperature and humidity reverse are early morning i.e. from about midnight to 8-12am.



TEMPERATURE

HUMIDITY



This is the period of the cycle when fauna, particularly invertebrates, can venture out of a cave with a reduced risk of overheating and desiccation. During daytime such animals seek shelter in a constant environment inside the cave then will move outside when the conditions are suitable to seek food. Thus there is a to-ing and froing of fauna between the cave and the outside environment.

What animals utilize caves? Here are some examples that I have encountered whilst squeezing into caves.



The majority of cave fauna are invertebrates with a number of species that utilize caves on occasions. This figure lists some of the species that permanently live in caves. A high proportion live within the cave floor, which is covered with droppings from the Euro (*Macropus robustus erubescens*) and this, unlike caves in more temperate areas, is the major source of energy for the cave ecosystem. Bat guano is commonly the source of energy in caves towards the coast and elsewhere.

There are three types of cave inhabitants that are defined as:

• Troglobites – Spend entire life in caves, specialised to life underground e.g. Pseudoscorpion



- Troglophiles Live entirely in caves but can live elsewhere
- Trogloxenes Live in caves but return to surface for food e.g. bats, cave crickets. Inside in the day and outside at night (driven by temperature and humidity)

What about animals that use caves for refuge? e.g. Euro, Echidna, reptiles. These are defined as Accidentals.

This article is just an overview of a very interesting project that I have pursued for many years. At this stage it can be concluded that:

- The definition of caves is inadequate to cover the range of structures used by arid zone fauna
- Caves, overhangs, cracks etc provide constant temperature and humidity that is exploited either permanently or temporarily by a wide range of fauna
- Unlike other caves that rely upon bat guano, the major source of energy in desert caves in eastern Australia is from Euro droppings and carcasses
- A range of troglobites, troglophiles and trogloxenes are known to occur within desert caves
- Some fauna utilizing caves as a refuge cannot be defined under the present system of terminology
- The caves and overhangs located within western Queensland and NSW are mainly associated with geological formations that have a duricrust capping
- The capping is mainly silcrete or ferricrete and such formations are found extensively throughout arid Australia
- Although karst formations have been extensively mapped in Australia, the mapping of pseudokarst formations that cover desert caves has been neglected
- My future work will entail more detailed analyses of cave environments using iButtons, continuing location and description of caves and overhangs and analysis of existing and on-going fauna collections from caves

Advertising Opportunities with the ECA

Website:

- \$200 for a banner
- \$300 for company name with some detail and a link
- \$500 for company name within box, logo, details and web link

All website packages run for one financial year and include a small ad in any newsletter produced during the financial year.

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- \$250 for a half page
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Advertising is available to service providers of the Ecological Consulting industry. The ECA will not advertise a consultant or their consulting business.

If you wish to advertise, please contact the ECA administrative assistant on <u>admin@ecansw.org.au</u>.



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Contributions to the Newsletter, Volume 45

Contributions to the next newsletter should be forwarded to the administration assistant Amy Rowles <u>admin@ecansw.org.au</u> by the **31st of August 2020.**

- Articles may be emailed in WORD, with photos included or referenced in an attached file as a jpg.
- Please keep file size to a minimum, however there is no limit on article size (within reason)
- Ensure all photos are owned by you, or you have permission from the owner
- Ensure that any data presented is yours and you have permission from your client to refer to a specific site (if not please generalise the location).
- All articles will be reviewed by the editorial committee, and we reserve the right to request amendments to submitted articles or not to publish.
- Please avoid inflammatory comments about specific persons or entity

The following contributions are welcome and encouraged:

- Relevant articles
- ◊ Anecdotal ecological observations
- Hints and information
- ♦ Upcoming events
- ◊ Recent literature
- New publications (including reviews)
- Photographs





Left and Right: Bridled Nailtail Wallaby. *Photo courtesy of Alexandra Ross.*









These camera trap images from the one site capturing a wild dog, threatened Spotted-tailed Quoll and threatened Brush-tailed Rock-wallaby all at the same shelter site!!! These cameras were lost in the latest bushfires which burnt all the way to the edge of the eastern side of Shannon Creek dam . Photos courtesy of Veronica Silver and Clarence Valley Council.







Above: Grevillea rivularis. Photo courtesy of Isaac Mammot.

Above: Bridled Nailtail Wallaby. *Photo courtesy of Alex*andra Ross.



Above: Sydney Crayfish, *Euastacus australasiensis*, in the endangered peat swamps of the Blue Mountains. *Photo courtesy of Sarsha Gorissen*.



Above: Grevillea arenaria. Photo courtesy of Isaac Mammot.