CAVES AUSTRALIA

The Journal of the Australian Speleological Federation Inc.

AUSTRALIAN SPELEOLOGICAL FEDERATION

Bats in Tasmanian Caves
NSW Sea Caves
Yarrangobilly — Mother of a Cave

No. 220 • JUNE 2022

The next ASF conference in Ceduna has been postponed.
The conference will coincide with the SA school holidays 16th-21st April 2023 (after Easter)

This decision was made by the conference committee and the ASF executive in light of the ongoing uncertainty regarding COVID, travel restrictions, vaccinations, boosters etc.

The activities, field trips and social aspects of the conference are a highlight for many and we want to make sure everyone who wants to attend can get there in person.

There are some things to look forward to, though...

There will be a series of exciting online talks and workshops to be held in early 2022 – more details to come.

The conference has been issued permits to access caves on the South Australian Nullarbor.
The field trips in 2023 will be a rare opportunity to visit caves that have not been accessible for many years.

Early bird registration has been extended to January 2023

We will contact those who have already registered to discuss whether you'd like a refund or to roll over your registration to 2023.

Have a question?
Contact event organisers at registration@asfconference2022.com

COMING EVENTS

COVID-19 is still disrupting international travel and events. Many events are now providing virtual attendance options. Information on UIS-sanctioned events can be viewed at http://tinyurl.com/y7rgb8ah

Don't forget that the International Year of Caves and Karst has been extended to this year — 2022. You can find more information about what's going on and what you can do to help the cause at http://iyck2021.org/

Caves Australia

No. 220 June 2022
Australian Speleological Federation Inc.
PO Box 388 • Broadway • NSW 2007 • www.caves.org.au
ABN 15 169 919 964
ISSN 1449-2601 • Registered Publication NBQ0005116

ASF

Contents

Cover: Ghosties Cave near Newcastle, NSW. Photo by Garry K Smith

CAVES AUSTRALIA

Caves Australia is the Journal of the Australian Speleological Federation Inc. and is published quarterly.

Editor:
Alan Jackson
Email: alan.jackson@lmrs.com.au

Production and Advertising Manager:
Alan Jackson
Email: alan.jackson@lmrs.com.au

Proofreading:
Susan White
Greg Middleton
Ian Curtis

ASF: asf.caves.info@gmail.com
For all ASF publications:
asf.caves.sales@gmail.com
Editorial contributions are welcome!
For contributor guidelines, contact the Production Manager.

Advertising
Contact the Production Manager for commercial, caving community and classified rates. Rates range from $5 to $400 for full page mono back cover. Discounts apply for placements of 4 adverts and an up-front payment.

Issue Dates
March, June, September and December

Magazine Subscription
Caves Australia is included within ASF membership fees. Subscription to the magazine is also available to non-ASF members at $40.00 including postage within Australia for one year (four quarterly issues).

Change of address
Notify us immediately of any address changes to ensure delivery of your *Caves Australia.*

Layout and Production by FB Design, Hobart, Tasmania

ASF Executive

President	Sarah Gilbert
Senior Vice-President	Colin Tyrrell
Vice-President	Steve Milner
Vice-President	Daniel Lansom
Vice-President	Janice March
Treasurer	Valdimar Jonsson
General Secretary	Phil Maynard
Executive Secretary	Andrew Stempel
Membership Secretary	Rod Smith

WANTED
ARTICLES FOR *CAVES AUSTRALIA!*

Whether caving, cave diving or generally just caving, *Caves Australia* readers are interested in YOUR story. It is only with YOUR contribution that we can produce a quality magazine for all to enjoy. For writing and style guidelines, contact the Editor or Production Manager.

Congratulations to Peter Matthews AO

PETER ROBERTSON

PETER MATTHEWS has been awarded the rank of Officer (AO) in the General DIvision of the Order of Australia.

The award recognises his distinguished service to cave and karst surveying, documentation and publication, and to speleological organisations (UIS, ASF & VSA).

Peter is a Fellow of the ASF and was instrumental in the development of the Australian Karst Index Database, as well as a founding member of VSA and their long-standing Karst Numbering Coordinator.

This AO is the most significant award an ASF member has received for speleological work in Australia.

There are a few AMs and OAMs but this is the first AO.

President's Report

IT'S ALMOST mid-year, which means the northern Australian caving season is kicking off again with several expeditions planned.

It's wonderful to see so many club trips happening this year and published in club newsletters and on social media. Meanwhile, our ASF Commissions have been busy behind the scenes. Here are a few highlights of what's been happening.

Publications: The first issue of our new look newsletter, *The Cave Cricket,* was sent out at the start of June. It contained more content than ever before, a splash of colour, graphics and the modern format aims to bring your news to the wider caving community. Thank you to Cathie Plowman and her team for working on the transformation. We all look forward to seeing this nymph grow.

Grants: We welcome Paul Osborne who has recently stepped up to the role as our new Grants Commissioner. A big thank you to Ric Tunney for leading the Commission for the past four years. We look forward to funding more of your club's projects in the coming years, for conservation, exploration, creating promotional material and more. Check out our web page for details on how to apply.

Library: Cathi Humphrey-Hood and her team of helpers have been steadily cataloguing the contents of the ASF library. She has also been increasing the volume of material, archiving documents and maps from Tasmania to Queensland. Also under development is a museum section of the library to house caving memorabilia with a story to tell.

South Australian Speleo Council: Congratulations to SASC and their grant writers on being awarded substantial funding through a partnership grant with the SA Department of Environment and Water. This will help fund the Kelly Hill project on Kangaroo Island, documenting and mapping the caves in the region and helping to engage with the local community.

Conservation: Unfortunately there are still many pressures on our cave systems, especially around new developments. Recent action has been taken concerning the Wombeyan Caves development plans, and information gathering continues for submissions on the Nullarbor Green Energy Hub. Thanks to Clare Buswell for her leadership and to all those involved with the NSWSC and Nullarbor SIG for collaborating on these issues.

BRIAN EVANS

Talk Series: In May we kicked off our five-part series of online talks as a taster for the next ASF conference in Ceduna, where Dr Perry Beasley-Hall introduced us to the fascinating world of subterranean invertebrates. In June Dr Lyndall Dawson delved into what Wellington Caves have revealed about the lives and extinction of the Australian megafauna. Save the second Thursday of each month for more talks ranging from bats, to exploration, to cave recue.

Ceduna Conference: after a long wait due to COVID cancellations the next ASF conference will be happening in Ceduna from 16-21 April 2023. Registration will be open again in July, so now is the time to start planning your big holiday to Ceduna, the gateway to the caves of the Nullarbor. We look forward to seeing you there!

Finally, a big thank you to everyone involved with the ASF Commissions — unfortunately there isn't enough space in one report to mention you all. — *Sarah Gilbert*

Kangaroo Island Caves

New grants to support conservation studies

Clare Buswell
FUSSI

Early in 2021 the SASC became a member of the Friends of Parks organisation. Friends of Parks operates under the auspices of the South Australia Department of Environment and Water. This membership opened up funding opportunities and thus it was that a few mad people, Clare Buswell, (lead author), David Gillieson, Matt Smith and Heiko Maurer set to, beavering away with two grant applications.

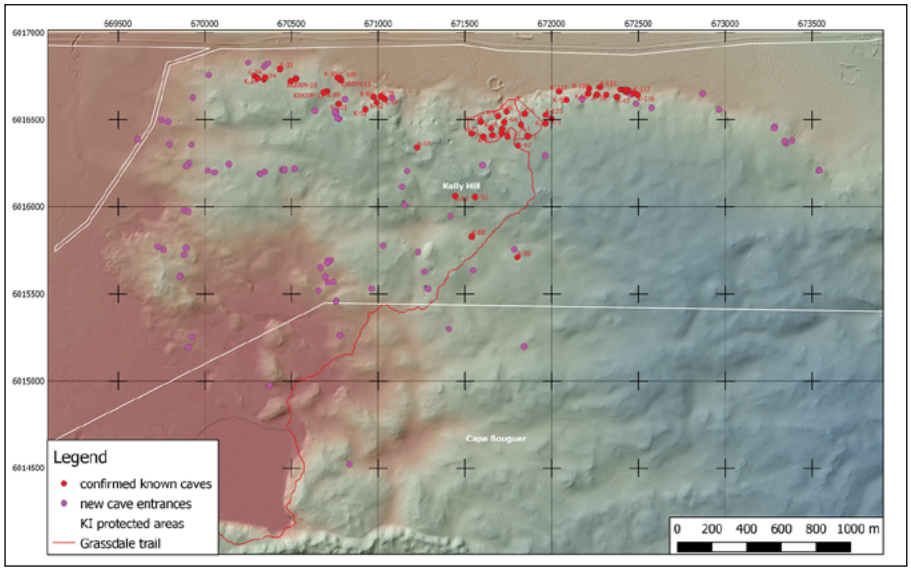
The results have been mind-blowing, to say the least. In October 2021 the SASC received a Friends of Parks Small Grant valued at $5500 for a project titled 'Relocating and Documenting the Caves and Karst of Western Kangaroo Island, Post the 2020 Bushfires.' The project runs for this year only and involves ground truthing from LiDAR images, cave tagging and setting up photo monitoring points.

It also involves the development of a geo-heritage trail application which promotes the values of caves and karst. The project is listed under the International Year of Caves and Karst events list.

In February of this year the Council received a Partnership Grant of $80,000 for a project titled 'A Multi-Disciplinary Study of the Caves and Karst of Western Kangaroo Island.' This project runs for three years, involving: cave surveying, ground truthing, cave tagging, LiDAR, archaeology and vertebrate and invertebrate fauna studies.

I would like to thank the ASF and the Karst Conservation Fund for its financial support over the course of 2021. This support not only significantly helped cover some of the costs involved in getting to Kangaroo Island, but set up the groundwork for the two grants.

Without this support and the huge amount of work of many SA cavers over the course of 2021, our grant applications would not have been successful.



JOEL DILLON, DAVID GILLIESON, JORGE HACKER

Kelly Hill CP — results of 2020-21 cave survey work superimposed on LiDAR imagery.

Prior to 2021 there were 135 caves numbered on Kangaroo Island. Over the course of 2021 the team of cavers involved discovered another 163 karst features.

We have now tagged 198 cave entrances in the Kelly Hill area, most of which await surveying. These two grants will facilitate the continuation of this work.

The Partnership project involves ten partnerships — SA National Parks and Wildlife Service, ASF, ACKMA and Airborne Research Australian, to name but a few.

Both projects have several people involved in the coordination. Principally:

- ***Administration, Media, Finance***
  Clare Buswell, FUSSI.
  Matt Smith. CEGSA & SCG
  Pam Payne, CEGSA
- ***Ground truthing and cave tagging***
  Minky Cockshell, SCG & CEGSA
- ***Cave Surveying***
  Matt Smith, Clare Buswell, Kevin Mott.
- ***GIS development and training***
  Joel Dillon SCG & CEGSA. Kevin Mott, CEGSA. Dave Gillieson, ACKMA.
  Bob Kershaw, ASF, ISS
- ***Archaeology***
  Keryn Walshe
- ***Vertebrate and Invertebrate Fauna Studies***
  Stefan Eberhard
- ***LiDAR***
  Airborne Research Australia.
  Dr Jorge Hacker, Flinders University.

We are all stunned at receiving these grants, we know that the work will be intense and we will need the help of many cavers from around the country.

The SASC looks forward to building a solid bank of knowledge concerning the karst of Western Kangaroo Island.

Please contact Clare Buswell if you are interested in helping out.

Karst Landscape Protection

Clare Buswell
ASF Conservation Commissioner

THE Conservation Commission continues to coordinate several ongoing nationwide issues around karst landscape protection.

Predominant among them is the Green Energy Nullarbor proposal. The company, Inter Continental Energy (ICE) has now reached the stage of undertaking its due diligence. This includes environmental impact assessments and a desktop study of background material relating to the area under consideration.

The Conservation Commission called three Zoom meetings attended by around 17-20 people, including the landowner of Mundrabilla station.

These meetings began the process of getting our facts in order and hopefully forming a working group to drive any ASF campaign/s. There is a huge amount of work to do here.

From the Conservation Commissioner's viewpoint, it is important that this GE proposal is nipped in the bud early, given that the WA Government, via its Minister for Green Energy, Alannah McTernan, gives it support.

One should also add to this the general feeling within the wider community that green energy, including hydrogen production anywhere in the country, is a way to go. Thus I strongly suggest that it would be prescient if the ASF quarantines some funds in readiness for campaigns which may end up with legal action.

The reason I mention the possibility of legal action is that the Wilderness Society of South Australia, after a long publicly supported campaign, finally stopped the drilling for oil in the Bight by launching legal action. See:

https://tinyurl.com/5ezah4hn
https://tinyurl.com/4pthe9ew

ASF members should be prepared.

WOMBEYAN CAVES RESERVE PRECINCT PLAN

In February this year the Commission placed a submission to the Blue Mountains Asset team, a section of NSW NPWS, concerning the inappropriateness of the proposed development in the Reserve. I sent copies of this submission to relevant State and Federal MPs.

The office of the NSW Shadow Minister for the Environment, the Hon. Penny Sharpe, has taken some action on the issue writing to the Minister for the Environment, Mr James Griffen. They were not satisfied with his reply.

Penny Sharpe is organising a meeting with us. This is a major break-through as getting meetings with ministers and/or shadow ministers is very, very difficult. It is a win for both the ASF and for speleological input.

My thanks to the NSW Speleological Council executive, Ian Eddison, Jill Rowling, Cathie Humphrey-Hood and Marilyn Scott in relation to this issue.

BROKEN RIVER

When cavers are up against the strongest arm of the Federal Government, in this case the Ministry for Defence, then the only way is to talk. Here I can thank Paul Osborne and Peter Bannink from Chillagoe Caving Club. Between them they have managed to deal with a revolving door of consultants and military personnel.

Their dogged determination has, so far, resulted in some protection of significant caves via the placement of exclusion zones around these features. They have also kept the door open for further access for mapping projects which will help us argue for further protection of the karst systems. The latter is at least something. The Commission continues to watch this space.

CAMOOWEAL CAVES

This has just really come to the fore as Santos is sniffing around in this area. As information is difficult to come by, I have been in contact with David Gillieson, Peter Bannink and Rod Obrien about it.

All are concerned about the hydrology. Once again, this is a 'watch this space' issue.

MT ETNA

The planned expansion of the gravel mine proposed in March of 2021 around the base of Mt Etna remains with the Livingstone Shire Council.

MT GAMBIER FORESTRY: *OneFortyOne Draft Management Plan*

The privatisation of SA forests has seen access issues arise for both cavers and cave divers.

The release of the management plan in May of this year provided the opportunity to raise issues around lessening the impacts of silvicultural practices on the karst areas under the One FortyOne Estate.

Basically, highlighting the need to protect the karst from inappropriate management practices, such as weed control programmes undertaken when major rainfall events are forecast, road clearing and maintenance, logging practices all of which can affect hydrology.

Cave access issues and references to the ASF minimal impact codes of practice have also been raised.

THANKS

I would like to thank ASF cavers for their time, support and many ideas concerning the above issues, without which the work of the Commission would not occur.

Bats in Tasmanian Caves

A bit of an enigma

John Wylie
SRCC

INTRODUCTION

While researching and documenting the megafauna held within Queen Victoria Museum (QVM), Launceston, I found a number of bat remains within the QVM invertebrate collection, noting they had been collected from within a number of Tasmanian caves (Wylie 2018).

There is a general perception that bats do not occur in caves in Tasmania (Doran *et al.* 1997, Richardson *et al.* 1997).

Bats belong to the *Mammalia* class, within the order of Chiroptera, consisting of two suborders:

- The *Megachiroptera* — flying foxes/fruit-bats
- The *Microchiroptera* — microbats.

Bats represent one quarter of Australia's mammal fauna, along with being the second most species-rich order of mammals, exceeded only by rodents (Law *et al.* 2012).

BATS OF TASMANIA

The Tasmanian bat fauna is composed of eight species (including one endemic species) representing four genera, belonging to the Microchiropteran family, *Vespertilionidae*.

The family members of *Vespertilionidae* (commonly known as evening bats), the largest family in the Chiroptera order, are the most widely spread of the bat family, and well established on every continent, except the polar regions.

The four genera within the *Vespertilionidae* family in Tasmania are: *Nyctophilus, Chalinolobus, Falsistrellus* and *Vespadelus*.

The first bats identified in the state were in 1821 (Taylor *et al.* 1987), and the most recent an endemic *Nyctophilus* species, in 2009. This bat was thought to be a subspecies of *Nyctophilus timoriensis,* which was first described in 1915; following a review it was given species status (Parnaby 2009).

This was made possible using detailed morphological comparisons and genetic data (Inada 2010).

TASMANIAN BAT SPECIES

LISA CAWTHEN

Lesser Long-eared Bat — Nyctophilus geoffroyi *(Leach 1821).*

LISA CAWTHEN

Chocolate Wattled Bat — Chalinolobus morio *(Gray 1841). **

LISA CAWTHEN

Eastern Falsistrelle — Falsistrellus tasmaniensis *(Gould 1858). **

TASMANIAN BAT SPECIES

LISA CAWTHEN

Southern Forest Bat — Vespadelus regulus *(Thomas 1906)*

LISA CAWTHEN

Large Forest Bat — Vespadelus darlingtoni *(Allen 1933)*

LISA CAWTHEN

Tasmanian Long-eared Bat — Nyctophilus sherrini *(Thomas 1915 & Parnaby 2009). Endemic*

Not illustrated
Gould's Wattled Bat — *Chalinolobus gouldii* (Gray 1841)
Little Forest bat — *Vespadelus vulturnus* (Thomas 1914).

BAT HABITAT

All species are nocturnal and have been recorded across the state. They are primarily forest dwellers, roosting and feeding in a wide range of forest habitats (Cawthen 2011), ranging from rainforests, wet eucalypt forests, mixed forests, wet and dry sclerophyll forests, wetlands and coastal zones.

Their preference for roosting are old large trees with hollows and cracks (Cawthen 2011, McQuillan 2012) under bark etc., providing greater insulation and safer diurnal refuge. Although numerous species have used a variety of other sites/structures to roost, like roof and wall cavities in all sorts of dwellings, bridges, mines, timber stacks, etc. (Taylor *et al.* 1987, Taylor & Savva 1988, Inada 2010 and Driessen *et al.* 2012).

BATS IN TASMANIAN CAVES — THE ENIGMA

There have been several reports of bat remains being found in caves, but no reporting of bats actually permanently roosting in the caves of Tasmania (Taylor & Savva 1988).

While bats in Tasmania are not known to permanently reside in caves, it is recorded that two species that live there, *Chalinolobus morio* and *Falsistrellus tasmaniensis,* have been found roosting in caves on the Australian mainland, along with numerous dead specimens of *Nyctophilus geoffroyi* (Driessen *et al.* 2012).

Lower temperatures do not seem to explain why the resident bat populations do not roost permanently in Tasmanian cave systems, as parts of New South Wales and Victoria, where a number of other bat species are recorded to roost/hibernate have temperatures similar and even cooler than in Tasmania, (Taylor *et al.*1987, Taylor & Savva 1988, Hamilton-Smith 2000, Inada 2010, & Driessen *et al.* 2012).

New Zealand is roughly on the same latitude as Tasmania, and has temperatures similar and in some cases colder than in Tasmania, and has two micro-bats and the short-tailed bat (three sub-species) which are all forest dwellers (O'Donnell *et al.* 1999, O'Donnell *et al.* 2009). The long tailed bat *(Chalinolobus tuberculatus)* is known to roost in caves, but mainly dwells in forests (Gurau 2014), with skeleton material of bats only occasionally found in caves (Dwyer 1960).

SIX RECORDINGS TO DATE OF BAT REMAINS FOUND IN TASMANIAN CAVES

1. The remains of *Nyctophilus* or *Chalinolobus* species and *Glischropus (=Falsistrel-*

lus) tasmaniensis, along with numerous other fossil species were found in a fissure/cave at Flowery Gully in 1952 (Gill 1968).

2. The remains of about 17 bats, comprising *Chalinolobus morio, Vespadelus regulus* and *Vespadelus darlingtoni* were recorded in 1985 some 800 metres from the cave entrance, in a side passage on the floor and on a wall in Wargata Mina (previously known as Judds Cavern (C1)) at Cracroft (Savva and Taylor 1986. Driessen *et al.* 2012).
3. The remains of *Vespadelus regulus* were recorded in a cave in the Mt Weld karst (Clarke 1985; 1988).
4. A major expedition to Precipitous Bluff was undertaken by members of the Tasmanian Caverneering Club in 1989-90. The remains of bats were discovered in Cueva Blanca (PB4) (Eberhard 1990).

DAVID WOOLS-COBB

5. In 2004 Henry Shannon visited Lynds Cave (MC14) Mole Creek to photograph a bat stuck to a wall (above). About a dozen other specimens were observed in the same locality. (Shannon 2006).
6. Several bats were possibly observed flying out of a karst feature (F101) 2PM Pot at Mt Cripps by Graham Brown on Saturday 24th November 2018 (Darby 2018).

BAT REMAINS COLLECTED FROM TASMANIAN CAVES AT QVMAG

1. In 1952 fossil bones had been discovered in a quarry at Flowery Gully on the western side of the Tamar River north of Launceston. The remains of *Nyctophilus* or *Chalinolobus* species and *Glischropus (=Falsistrellus) tasmaniensis*, were recorded from soil that was believed to have come from a fissure or a cave.
2. In Main Cave (GP1-4) at Gunns Plains, more than 100 bats were found dead at the back of an aven, some 500 metres from the known entrances. These were collected by Jean Jackson and S. Eberhard 20/4/1989. Species identified by R. Taylor were: Chocolate Wattled Bat *(Chalinolobus morio);* Lesser Long-eared Bat *(Nyctophilus geoffroyi)* and *Nyctophilus timoriensis sherrini*. Following a review, the latter is now known as the Tasmanian Long-eared bat — *Nyctophilus sherrini.*
3. During the 1980s Stefan Eberhard collected bat remains in Growling Swallet (JF36).
4. Stefan Eberhard on 5 January 1990 collected bat bones in the Whiteroom, Cueva Blanca (PB4) at Precipitous Bluff.
5. On 20 October 1990 Stefan Eberhard collected some bat bones in Kubla Khan (MC 1, X ref 29, 34) at Mole Creek.
6. The remains of bats were collected by Stefan Eberhard 800 metres from the cave entrance in Wargata Mina (previously known Judds Cavern (C1)) at Cracroft.

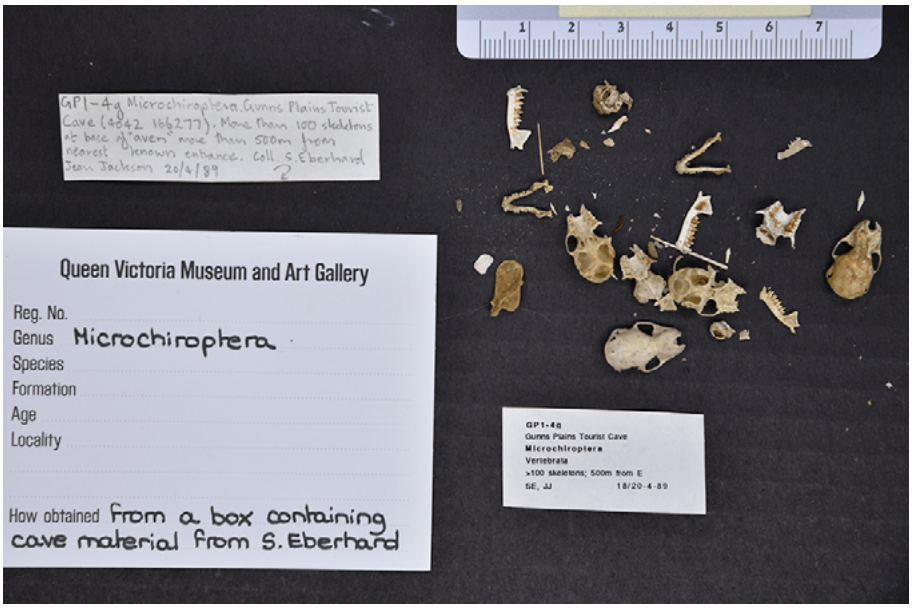
ACKNOWLEDGMENTS

Thanks to Queen Victoria Museum staff David Maynard, Tammy Gordon and Margaret Murray for access to the Museum collection of bats collected within Tasmanian caves.

Thanks to Margaret Turton, Paul Darby, Lyndsey Gray, Jill Bennet, Henry Shannon, David Wools-Cobb, Arthur Clarke, Bill Tomalin, Peter Murray, Greg Middleton and Alan Jackson for tracking down additional contacts and information.

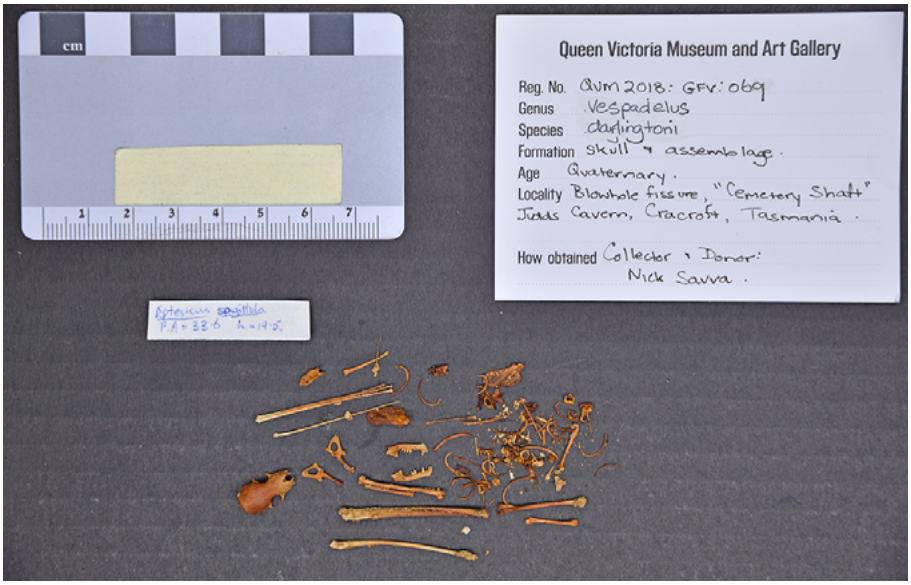
Thanks to Lisa Cawthen for supplying photos of the Tasmanian bat material.

QVMAG BAT REMAINS



QVMAG

Microchiroptera *remains from Gunns Plains Main Cave (GP1-4)*

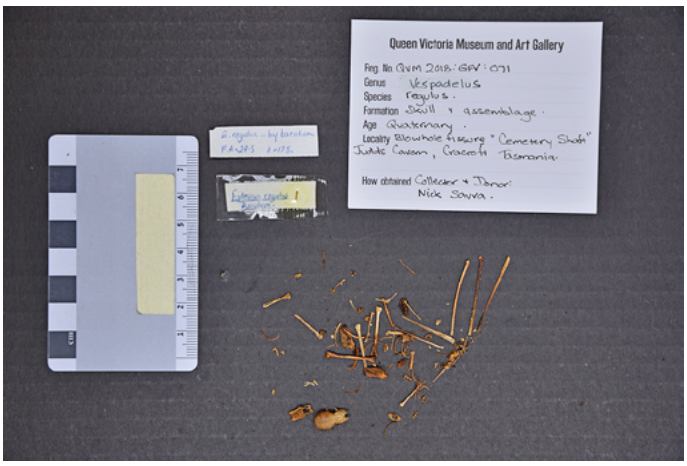


QVMAG

Vespadelus darlingtoni *remains from Wargata Mina at Cracroft*

QVMAG

Vespadelus darlingtoni *remains from Wargata Mina at Cracroft (C1)*



QVMAG

Vespadelus regulus *remains from Wargata Mina at Cracroft (C1)*

REFERENCES

Cawthen, L. 2011 Calls for observations of bat roosts & other bat related information. *Forest Practices News,* 11(1): 8

Cawthen, L. 2015 *Tasmanian Bats and their Habitat — a Guide.* Cooperative Research Centre for Forestry & the Tasmania Forestry Practices Authority.

Clarke, A. 1985 Existing discoveries in the Cracroft Region (April/May 1985) *Tasmanian Cave and Karst Research Group Newsletter,* 2: 31-38

Clarke, A. 1988 The biology of caves in Southern Tasmania. *Tasmanian Cave and Karst Research Group Newsletter,* 3: 18-29

Darby, P. 2018. Trip Report. Mt Cripps (SES S&RU NW). *Speleopod,* 83: 15

Doran, N.E., Eberhard, S.M., Richardson, A.M.M. and Swain, R. 1997 Invertebrate biodiversity and conservation in Tasmanian caves. *Memoirs of the Museum of Victoria,* 56 (2): 649-653

Driessen, M., Brereton, R. & Pauza, M. 2012 Status and conservation of bats in Tasmania [in] Law, B., Eby, P., Lunney, D. & Lumsden L. (Eds) *The Biology and Conservation of Australasian Bats.* Royal Society of New South Wales pp. 324-336

Dwyer, P.D. 1960 *New Zealand Bats.* Tuatara, 8 (2): 62-71.

Eberhard, R. 1990 1989/90 Precipitous Bluff Expedition. *Speleo Spiel*, 258: 9

Gill, E. 1968 Aboriginal bone implement from fossil bone bed, Tasmania. *Rec. Queen Vic. Mus.,* No. 31: 1-5

Gurau, A. 2014 The Diet of the New Zealand long-tailed bat *Chalinolobus tuberculatus* (thesis). Masters in Zoology. Massey University Manawatu New Zealand.

Hamilton-Smith, E. 2000 Bats in Caves. *ACKMA Journal,* 39: 1-3.

Inada, M. 2010 Tasmanian bat ecology: Conservation of native fauna. School of Geography and Environmental Studies. University of Tasmania. June 2010. 141 pp. (thesis)

Law, B., Eby, P., Lunney, D & Lumsden, L. 2012 Preface. *The Biology and Conservation of Australasian Bats.* Royal Society of New South Wales.

McQuillan, P. 2012 IVG Forest Conservation Report 9A ENGO proposals. Report to Professor Jonathan West, Chair of the Independent Verification Group. p.49. https://tinyurl.com/3pua4vc9 Accessed 2 Jan 2019

O'Donnell, C., Christie, J., Corben, C., Sedgeley, J. & Simpson, W. 1999 Rediscovery of Short-tailed Bats *(Mystacina SP.)* in Fiordland New Zealand: Preliminary Observations of Taxonomy, Echolocation Calls, Population Size, Home Range, and Habitat Use. *New Zealand Journal of Ecology,* 23 (1): 21-30

O'Donnell, C., Christie, J., Hitchmough, R., Lloyd, B. & Parsons, S. 2009 Conservation status of New Zealand bats. *New Zealand Journal of Zoology,* 37 (4): 297-311

Parnaby, H. 2009. A Taxonomic review of Australian Greater Long Eared Bats previously known as *Nyctophilis timoriensis (Chiroptera: Vespertiliondae)* and some associated taxa. *Australian Zoologist,* 35 (1): 39-81

Richardson, A., Doran, N., Eberhard, S. and Swain, R. 1997. Bioconservation and Tasmanian cave fauna [in] Henderson, K., Houshold, I. and Middleton, G. (Eds) Cave and Karst Management in Australasia 11: *Proceedings of the Eleventh Australasian Conference on Cave and Karst Management,* Australian Cave and Karst Management Association, Carlton South and Parks and Wildlife Service Tasmania, Hobart pp. 17–24

Savva, N. and Taylor, R. 1986 Bat remains in a Tasmanian Cave. *Macroderma,* 2: 21

Shannon, H. 2006 Trip Report, Lynds Cave 25th May 2004. *Troglodyte,* 16(1): 22

Taylor, R., O'Neill, M. & Reardon, T. 1987 Tasmanian Bats: Identification, Distribution and Natural History. *Pap. Proc. R. Soc. Tasmania* 121: 109 – 119

Wylie, J. 2018. Discovery of Tasmania's first cave with an assemblage of Pleistocene megafauna and ongoing discoveries to the present. *Caves Australia* 206: 5-11

Snapper Point Sea Cave — for scale, note the size of people on the right side of the entrance (circled). All photos in this article are by Garry K Smith.

Sea caves south of Newcastle, NSW

Garry K Smith
NHVSS

SEA CAVES in the rugged conglomerate and quartz sandstones cliffs between Catherine Hill Bay and Frazer Beach NSW could arguably be among some of the best in Australia.

They vary from just a few metres in length to chambers 80 m long x 40 m wide and may have multiple entrances. Much of the above-mentioned coastline is within the Munmorah State Recreation Area, managed by the NSW National Parks and Wildlife Service.

The caves are mostly inaccessible at high tide and during high ocean swell, as waves crash into them with such ferocity as to be life-threatening to anyone caught inside. However, when the tide is low and wave conditions permit, these caves can be explored in safety and admired for their beauty and awe-inspiring size.

There are more than 16 major sea caves along this three kilometres of coastline. Hence, a 6 km return coastal walk at the right time can be a very rewarding experience.

Detailed in this article are seven of the major caves, which have specific points of interest. The article concludes with discussion off what constitutes a sea cave and how they can form.

PINK CAVE (I6E-18)

This cave is located south of Catherine Hill Bay and is accessed from Mooney Beach by walking about 0.5 km across the relatively flat rock platform in a northerly direction until an obvious deep-water trench leads directly into the cave.

A ledge of the platform with plenty of width to safely walk along, extends right into the cave beside the water-filled trench. The cave is approximately 53 m long x 14 m wide x 6 m high.

The full length and height of the trench inside the cave is covered in a vivid shade of bubble-gum pink coralline algae, a great deal of which is exposed at low tide. The high and persistent wave action in the cave's trench is the ideal condition for the algae to thrive and cover the rocks with a hard calcareous deposit forming part of their structure.

There are also a number of areas where off-white coloured calcium carbonate is being leached from the quartz sandstone and conglomerate rock above to form small, poor-quality speleothems in the form of flowstone, stalactites and stalagmites.

GHOSTIES BEACH CAVE (I6E-29)

This cave is located about 1.8 km south of Pink Cave at the southern end of Ghosties Beach. It can't be missed as the large slot entrance is obvious in the north-facing cliff at the southern end of the beach.

The cave has two entrances and has been

Coralline algae gives Pink Cave its name

created by erosion along joints in the sandstone cliffs.

At low tide it is easy to walk through from one entrance to the other on a sand-covered floor.

The passage leading from the slot-shaped entrance facing north measures approximately 37 m long x 5 m high x 2 m wide.

At the end of this passage the cave opens up to a chamber measuring 12 m x 12 m x 5 m high with the east side opening to the other entrance facing the sea.

While not a cave of large proportions, it is perfect for getting those magic photos looking out to sea or down the beach. The light cream colour of the sheer rock cliffs in the right light can be dazzling — you just have to wait for the right light.

There are some pretty but small calcite speleothems in this cave if one takes the time to look carefully.

GHOSTIES NO.1 SOUTH

No name or number appears to have been previously allocated to this cave, so I have called this cave Ghosties No.1 South, because it is just 30 m SE of 16E-29.

Even at low tide this cave has small waves entering several metres into it. The floor is mostly covered in beach sand. The cave is 27 m long with an entrance measuring 7 m wide x 4 m high tapering to <1 m at the very rear. The actual length is possibly 10 m more as sand build-up at the rear (observed during surveying) appeared to be blocking entry to a chamber noted during a visit several years earlier.

Calcite flowstone in Ghosties No. 2 South

There were a number of calcite speleothems in this now-inaccessible chamber. This is a beautiful cave to take photos from, to silhouette people against the backdrop of ocean and beach.

GHOSTIES NO.2 SOUTH

I have called this cave Ghosties No.2 South, as it has no gazetted number and is the second small cave, about 70 m south of Ghosties Beach Cave.

The cave is accessed by climbing over the small rocky headland. It is above the high tide level but in bad weather it would get the occasional wave breaking over the rock platform and into the cave. The cave measures 20 m wide x 12 m deep x 2.8 to 1.2 m high.

At the back of the cave are several areas of well-formed calcium carbonate speleothems — shawls, flowstone and small stalagmites. See attached photo of flowstone and shawls.

TIMBER BEACH CAVE (I6E-33)

The next major cave south is the Timber Beach Cave located at the base of a cliff on the south side of a 40 m long beach of the same name. It is just 130 m south of Ghosties No.2 South.

The cave has been created along several parallel and intersecting joints that have been eroded away to such an extent that in some places only pillars of bedrock remain to support the cave roof at the seaward extremity.

The first two chambers are almost identical in size, measuring approximately 32 m long 17 m wide x 4 m tapering to 1 m high, which it could be argued are two separate caves connected by an overhang.

These two chambers can be entered at mid to low tide.

A much larger chamber can be accessed via a narrow passage by wading in knee

The north facing entrance of Ghosties Beach Cav

deep water at a very low tide and low swell. This passage leads into a huge chamber measuring 80 m long x 40 m wide x >6 m high (above low water level).

The surveyed cave length exceeds 300 m of passage including the large chamber, an extraordinary size for a sea cave. There are five entrances from the ocean into the large chamber, but only one is accessible by wading.

This passage leads to an exposed rock platform covering half the area of the large chamber. Waves enter through the other four less-protected deep-water ocean entrances.

The sound of crashing waves is amplified in the cave, a reminder to keep an eye out for dangerous freak waves.

Some parts of this cave are coated with the bright pink calcite deposited by coralline algae and there are a few locations where calcium carbonate has leached from the sandstone above and deposited as poor quality speleothems. Overall, this is an amazing cave that is difficult to capture in a photo because of its size.

Although not commonly known, some people have visited the large chamber of this cave when conditions permit. The full extent of the cave does not appear to have been known at the time of compiling the 1985 *Australian Karst Index* (Matthews 1985).

CANYON SEA CAVE (I6E-34)

The cave is located 280 m south of Timber Beach. It consists of a large partly water-filled passage of approximately 37 m in length, plus a 40 m x 17 m wide tunnel which goes right through a rocky headland.

The tunnel has approximately 2 to 5 metres of air gap along its length at low tide. A water-filled canyon (approx. 5 metres deep) in the rock shelf leads to one entrance and the other entrance facing north at right angles to the prevailing ocean waves. The canyon funnels the ocean waves into the cave.

It is an amazing cave for a diver or just a swim through, if one can time entry with low swell conditions. Even if you're not a diver then just looking into this cave from either entrance is awesome.

SNAPPER POINT SEA CAVE (I6E-40)

This cave can be accessed by walking to the southern end of Snapper Point and then around the rock platform back toward the north until you are looking directly at the cave in the base of a cliff.

A deep-water inlet funnels waves into this cave, which can only be entered during absolutely perfect conditions; however, one must still do some swimming.

The cave can be extremely dangerous and lives have been lost in this vicinity when fishermen have been washed off rocks by freak waves.

The cave is basically one large chamber measuring 62 m long x 15 m high x 64 m wide (18 m wide at the entrance). The waves crash onto the sand and pebble beach just inside the entrance.

One can see most of this cave from the safety of an elevated rock platform at low tide and low swell. Hence there is little need to actually put oneself in danger by swimming into the cave and then upon exiting, undertaking the risky act of trying to scramble back on to the rock platform between waves.

WHAT ARE SEA CAVES AND HOW DO THEY FORM?

Sea caves are sometimes referred to as 'littoral' caves. This term relates to the shore of a lake, sea or ocean. In coastal environments, the littoral zone may extend well above the high water mark, which is rarely inundated, to shoreline areas that are permanently submerged.

Generally speaking, sea or littoral caves in sedimentary rocks are created by mechanical erosion along joints or bedding-planes or contact zones between layers of relative weakness, where the waves attack the rock to create the caves, whereas in metamorphic or igneous rock the weakness is typically a dyke, fault or major joint.

Sea caves can also form in carbonate rock (limestone), such as a few reported along sea cliffs in Victoria, which have been created by wave action at or near the water line.

However, higher up the cliffs there are multi-process caves that were initially created by dissolution and later modified by wave action.

True sea caves should not be confused with dissolutional caves exposed by retreat-

This photograph gives some idea of the impressive size of Timber Beach Cave

Timber Beach Cave entrance. For scale, note the size of the person in distance close to sea entrance centre of image

Entrance to Snapper Point Sea Cave

Pink Cave, Catherine Hill Bay

ing cliff-lines and later modified by subsequent wave action (Bunnell 2006).

Sea cave development is initially driven by direct wave action and salt erosion of rock along zones of weakness. As a cave becomes larger, rock is removed at a greater rate by rock particles carried by the turbulent water plus the tremendous force of air and water compression in the confined space (Webb *et al.* 2003, Kiernan 1979, Bunnell 2006, K&GU 2011). The cave roofs can at times collapse and create blowholes.

REFERENCES

Bunnell, D. 2006 Littoral Caves [in] Gunn J. (Ed) *Encyclopedia of caves and karst science,* Master ebook, pp. 1050-1054

K&GU 2011 *Sandstone Arches and Caves. Guide to New South Wales Karst and Caves,* Karst and Geodiversity Unit, Office of Environment and Heritage, NSW Government.

Kiernan, K. 1979 Sea Caves and Morphological Karst on the Tasmanian Coastline. *Southern Caver,* 11(2), 2-23

Matthews, P. G., 1985 *Australian Karst Index*. Australian Speleological Federation Inc.

Webb J.A., Grimes K.G. and Osborne A. 2003 Black Holes: Caves in the Australian Landscape [in] Finlayson, B.L. and Hamilton-Smith, E. (eds), *Beneath the surface: a natural history of Australian caves, pp.* 1-52. University of New South Wales Press Ltd, Sydney.

These sea caves are located at the south end of Timber Beach in Munmorah State Conservation Area 30 km south of Newcastle. They can be very dangerous as waves crash Into them most of the time and are only accessible during low tide combined with low swell conditions. They are formed in quartz sandstone and conglomerate rock. The cliff line has been accurately drawn by overlaying a satellite image of the coastline. Grid reference is 720278 Catherine Hill Bay map (9231-4-S) 1-25000. Total length of caves exceeds 300 m.

0 4 8 12 16 20 24 28 32 36 40
Scale in Metres

CAVES LOCATION	Timber Beach Cave	CAVE No.	I6E-33
SURVEY GRD.	ASF 64	SURVEY PARTY	Garry K. Smith
DATE: 20-9-21	MAP No. 126		
SCALE		DRAWN BY	Garry K. Smith
NEWCASTLE & HUNTER VALLEY SPELEOLOGICAL SOCIETY. (NEWCAVES)			

Mother of a Cave

Yarrangobilly unveils a secret

Jason Moule, Phil Fleming, Edd Keudell, Andrew Nosworthy, Charlotte Nosworthy, Hossein Shargh, Josh Small, Hannah Small.
HCG

THE MYSTERY OF WEST DEEP CREEK

This story is about West Deep Creek Cave, Yarrangobilly, NSW.

The Yarrangobilly Caves are set in a block of limestone in the Snowy Mountains, about 400 km south of Sydney, in NSW. The area gets snowfalls during the winter and has a nice temperature in summer. The caves have lots of colourful formations, with a spectacular arch in the tourist precinct. The Yarrangobilly River runs through the limestone to create a highly scenic gorge and other karst features.

West Deep Creek Cave, Y-6. had always been known as a small wet cave situated in one of the largest collapse dolines on the Yarrangobilly Plateau. Hydrologically important, Deep Creek drains surface water year-round to feed a single sink in the West Deep Creek doline.

Since the 1960s any visiting caver would quickly realise the potential of West Deep Creek. A healthy surface stream sink that had been dye traced to the Yarrangobilly River 3 km away must have more cave than a short, wet, cold rockpile that defied all efforts to push with the stream quickly and mysteriously disappearing through gravel floors and rifts — a system that should be there but no one could find a way into. Over time even the Y-6 entrance choked up with gravel and silt and so the West Deep Creek system became impenetrable.

All this was to change in 2018 when a small group of HCG cavers made a spectacular discovery which has led to over 3.3 km of new surveyed cave passage with outstanding decoration, skeletons, ancient sediment banks and a raging underground river.

BLACKBERRIES AND BREEZES

It all started with a phone call from Phil Fleming to Jason Moule at the start of March 2018. Jason describes what happened.

'Phil rang to see if I wanted to go on a trip to Yarrangobilly at Easter 2018. I hadn't been caving for quite a while so I thought that would be fun. After a trip to North Deep Creek Cave to replace the padlock for National Parks, Phil said, "Why don't we make a round trip and see if West Deep Creek entrance has opened up?" So away we went.

JOSH SMAL

A snowy start to the day in the Snowy Mountains

'After bashing through blackberries we found the Y-6 entrance still blocked. We had a look around the doline and Phil and Alan Green (SUSS) were looking at a hole in a rockpile when I noticed a breeze heading into an entrance and thought that there must be more cave in there. The entrance was Y-395, 'Boulder Mother Cave'. So named by Geoff McDonnell (SSS) (McDonnell, 2016) due to the enormous house-sized boulder sitting over the top of it.

'We were pretty excited about the possibilities of where this breeze could lead, so we planned a return trip for 11th-13th May 2018. Phil asked Edd (a cave surveyor from the USA) to come along. Jason came with Andrew and Charlotte. On the drive up on Friday night there was 60-70 cm of snow beside the road. Charlotte hadn't seen snow like that before, so we stopped and played in the snow, running around like we were 15-year-olds again, having snowball fights. We camped for the night at Cotterill's Cottage. Cotterill's is the last remaining intact building of the Yarrangobilly Village, built in 1898, and is now used as a cavers' hut.

UNDER THE BOULDER MOTHER

'On Saturday morning Phil, Edd, Jason, Andrew and Charlotte headed to Y-395 all keen to see what we could find. After entering the cave, Jason found a tight squeeze with a breeze going into it, but it had a large rock jammed in the middle of it so it was impassable. Andrew said, "Why don't we try this squeeze under here?" Lower down was a tight, gravelly squeeze. Andrew tried squeezing through it feet first and could not quite get through. I had a go head first and with a lot of wriggling and grunting, just made it through. "Yehaa! I'm through," I exclaimed with excitement, and I could see more passage through the rockpile. "I'll

have a quick look to see if the cave keeps going." With adrenaline pumping, I had a quick look and the rockpile kept going and opened up. I then went back through the gravel squeeze and helped Andrew through. Edd was just the man we needed, a cave surveyor who had done a lot of surveying in North America inclusive of Lechuguilla Cave and caves in Mexico, came through with the others. To our surprise and admiration, Edd pulled out his Disto and notebook and started surveying straight away.

'We had a good day playing in a large clean rockpile with no sign of bedrock passage.

'And we realised this was not virgin cave — so far. Since we found scratches and marks on rocks which indicated the area was known to previous cavers.

'Still, we were not disappointed. But it had been a long day in cool conditions and the return to Cotterills' proved to be eventful.'

PHIL FLEMING

Charlotte in the Under Y-6 area

MOTHERS DAY (OF A CAVE)

Bushwalking in the dark

Despite the trip into West Deep Creek being straightforward in daylight, the return trip was more interesting. Our youngest trip member, Charlotte (aged 12 at the time) describes the return trip.

'Phil, Edd, Jason, Andrew and myself made the journey back to the surface. The boulders were huge and a struggle to get over. Edd kindly helped me get over them and across the large gaps between. We made our way up the gravel crawl and through the 10-point manoeuvre and through the first squeeze, only to find that it had started to rain. Exhausted and tired and now having to get absolutely saturated in the rain on the ascent back up the hill to the vehicles about 1 km away. Temperature was 5ºC.

'Fighting and struggling our way through the blackberry ground cover (about 1.7 m high), we crossed Deep Creek but we were having difficulty with our direction to get back on track. Phil was suggesting that we needed to head back down to the creek although Andrew pointed out that in doing that we would be heading further away from the cars and therefore we needed to head uphill. Phil rechecked his compass and it indicated that the direction of the cars was to continue on the route we were on.

'Andrew soon realised that we had been hours longer than we had intended in the cave and it was time to get going home. So he pushed his way through the massive blackberry bushes. I followed close behind, while Phil was still checking his compass and insisting we needed to follow the other route. So, our party became separated.

'Andrew decided that it would be too difficult to backtrack through the blackberry bushes again, so he and I decided to push on and meet the rest of the group at the top of the hill above East Deep Creek. Meanwhile, Phil discovered that his compass had a hole in it and was useless. Lost in the freezing cold, in the dark, with no idea where the rest of the group was, it was after a lot of cooeeing we were met in torchlight by Jason. We headed down to East Deep Creek Cave entrance where we met up with the rest of the group and had a quick rest and a snack before making our way up to the cars.

'Not only was I exhausted from the cave trip, but also from getting lost. I struggled to keep up with the group so Andrew and Jason had to pull me up the hill to the cars. Andrew and I had told my Mum that we would arrive home at 9 pm but we arrived back to the cars at that time.

'We left Yarrangobilly pretty quickly and once we regained mobile phone service picked up several missed phone calls from my mum as well as a call from Tumut Police Station who had been asked by NSW Cave Rescue to check that we were out of the cave and safe! My Mum was pretty keen to have us home.

'Eventually we arrived home the next day, Sunday at 4 am in time to celebrate Mother's Day. Thankfully we were all okay except for a few scratches and bruises.'

Because of this trip, Charlotte thought up a way to mark our way in so that we could find our way out in the dark easily in future. She made some highly reflective loops that we placed in prominent spots on the walk in, and we followed the reflective trail on the way out.

DISCOVERY OF THE 'SNOTTY SLOT'

We were back two weeks later. Phil, Edd, Jason, Kristin Moule, Andrew and Charlotte met at Cotterill's Cottage on the 1st June 2018, all excited and keen to explore the Y-395 rockpile. We all went to the cave on Saturday, squeezing into the rockpile to continue surveying. Edd, Phil, Andrew and Charlotte went into the rockpile to find the way on. Jason noticed a breeze going into another tight squeeze so Kristin waited at the start of the squeeze while Jason squeezed through to see where it led to. Jason climbed and squeezed down a tight chimney, moving any loose rocks that could fall on him on the way down.

Jason describes it.

'In places I had to change positions of my head so my helmet would fit down the chimney. There were a few reasonably-sized rocks that had to be moved to make it safe. The sides of the chimney had quite a lot of sharp bits of rock sticking out that tore my overalls and hands on the way down. After going vertically down about 10 m the passage suddenly opened up into a walk-through bedrock passage. Yeehaa! Continuing down it opened up into a 15 m pitch. I was very excited and I had adrenaline pumping. I climbed back up the chimney, the sharp bits of rock acting like Velcro so I didn't slide back down. Kristin was waiting patiently for me and I exclaimed, "I found the way on!" This chimney was later named by Andrew as 'Snotty Slot' because of the snotty type of rock that it's made of. Edd and Andrew went back down with me with a 25 m tape. I climbed down the 15 m pitch using the tape as a handline, walked 5 m and then the passage narrowed down

ANDREW NOSWORTHY

Jason climbing down the first pitch for the first time

and became impassable. I couldn't feel any breeze at the bottom, but the breeze had to be somewhere. I took a photo looking up the aven at the end of the passage. Edd surveyed to the bottom of the pitch. We all headed back out satisfied but a little flat that our discovery seemed to have fizzled out so soon.'

THE HCG SUPER-LIGHTWEIGHT SCALING POLE

Jason continues.

'The next trip was booked for 5th-8th July 2018. We were joined on this trip by Hossein Shargh. I had enhanced the photo I had taken of the aven and studied it intensely. I studied it that much at work that they said if I looked at it any longer I would actually be in the photo. I became convinced I could see a passage running off the top. This aven needs to be climbed.

'In the photo I noticed some blades of bedrock near the top of the pitch which could be used for attaching aid. We entered the cave on 6th July and Edd and Hossein went to explore the rockpile while Andrew and Jason went to do the aven climb. We took down the HCG scaling pole, also called the Caving Redundant Assistance Pole (CRAP), a 20 mm plastic electrical conduit in 1 m lengths that fitted together to lift a tape with carabiners connected over the blades of rock so I could do the climb being top belayed from the blades of bedrock. After climbing the 15 m aven I was really excited to find a passage that went 5 m and led to the top of another pitch 15 m back down. We called this section the Ups and Downs. Jason rigged these two pitches and Andrew followed. At the bottom of the third pitch there was a squeeze going down; this led into the 'T Canyon', a tight, long, awkward horizontal squeeze/crawl. We called it T Canyon because it has a horizontal flattener with a vertical stream canyon going down from the middle of it. I squeezed down it for a while and then turned around about 6 m short of the end and met up with Andrew at the top of the Ups and Downs. He was talking to someone. Had the others come down as well? Edd had found a slot that connected from the rockpile to the top of the Ups and Downs — a voice connection. Edd said with a worried voice, "We are getting wet, there is water coming through the rockpile and it is increasing in flow — we are heading out." Andrew replied with excitement, "We are nice and dry and sitting at the top of a 15 m pitch with a passage leading off the bottom." We all headed back out. We all excitedly chatted about the finds over a hot dinner in my caravan that I had towed up for the weekend.'

NO MORE SQUEEZING

The Horseshoe Chamber and Wrays Room

The next day we were back into the cave with more rope and rigging gear. Jason re-rigged the pitches while Hossein and Andrew abseiled down and went to the end of the T Canyon. Jason caught up with them and Andrew said 'There's a black hole with an echo coming out of it', Jason thought he was joking. After an hour or two squeezing through the small, tight T Canyon, Jason looked at the end and there was indeed a black hole with an echo. Andrew was right.

Jason describes it.

'When I shined my torch down it looked like a long way, seemed to disappear into another black hole at the bottom. I said it could be 50 m deep. The others said about 15 to 20 m deep. Edd surveyed through the T Canyon.

'When we measured the pitch it was about 15 m. The others said my estimate must have been 'Jason metres'. I heard all about 'Jason metres' for the rest of the exploration of the cave. "Are you sure of that measurement, Jason?" or "Is that 'Jason metres?'" they would say.'

Jason rigged the pitch and abseiled down, followed by Hossein. Off to the side we found a large boulder-filled room which we called the Horseshoe Chamber. Hossein went back through the mud passage at the bottom of the pitch to a large room

HOSSEIN SHARGH

Andrew and Phil in the Ups and Downs

JASON MOULE

Hossein in the T-Canyon

which we named Wrays Room in honour of our friend and HCG member, the late Dr Robert Wray. Jason had a good look around Horseshoe Chamber.

The contrast with the entrance sections was remarkable; the cave had gone from squeezes and pitches to chambers and walk-through passages. The survey told us we were now 94 m deep and had logged 248 m of passage.

DISAPPOINTMENT, THEN ELATION

The underground stream located — mother of a trip!

We went back to Yarrangobilly on 19th-22nd July 2018. On Saturday morning we woke up to a fresh covering of snow. We had a quick breakfast, entered the cave at about 9:00 am and kept exploring and surveying as we went.

Josh Small had joined the team. Jason bought 100 m of brand-new rope, 10.5 mm Bluewater II ++ and 25 m of tube tape for rigging the cave. Phil had bought 30 m of new rope and tape to rig in the cave. We had a lot of gear, two full packs each. We found a floor canyon that led to another 14 m pitch through the roof of a rockfall chamber, the last pitch before a horizontal passage. Jason rigged the pitch and Josh was the first one to abseil down, closely followed by the rest of us.

Jason describes it.

'As Josh abseiled down, I called out, "What does it do?" Josh replied with excitement. "The walls of the shaft turn into the ceiling of a large chamber, and it keeps going. It's big." When I abseiled down all the boulders on the bottom were covered by a thin layer of dark brown mud and every step we took revealed a lighter-coloured mud underneath — our footprints were the first. We had to be careful that the boulders were solid when we walked on them. We called this chamber Rockfall because of the amount of rocks and boulders that had fallen from the ceiling. The others came down and we started surveying. Before we explored the chamber and passages, Edd said, "Survey as we go, no scooping," which he ended up saying many times on the trips. We adhered to this rule throughout, so Edd got to explore as well as survey.

'At the end of the Rockfall Chamber we found an aven and nearby a muddy passage that continued down to a stream which we named the Babbling Brook. The muddy passage turned into a small squeeze. Andrew slid down into it head first and Jason followed. The muddy squeeze got a little bigger then turned into a clean washed

HOSSEIN SHARGH

Edd and Jason at start of Snowy River

bedrock tube about 1.5 m round with scalloping on the walls and floor and a little creek running through it. It went for about 50 m then sumped. Drat! We went back out and met the others. Edd started rabbiting around in the rockpile at the aven end of the chamber and found a way through to a larger chamber. After looking around this chamber we realised it was Wrays Room that we had found on the previous trip. We started to head out. The level of excitement was diminished in the group. Was this all there was to this cave?

While waiting for the others to prusik back up the rope, Jason had a look around the chamber and saw half an old stream tube with scalloping on it up the wall of the chamber a little. He describes.

'I followed the remains of the tube, then it turned and went through the wall of the chamber down low — the way on. I clambered down to the start of it and stuck my head in. I could hear running water. I yelled to Edd and told him about the passage. I said I would have a look to see where it goes. The passage was nearly full of sediment. I crawled through the passage, then down the sediment bank at the other end of it into a large walk-through old streamway, with a loud sound of water coming from one end. I was very excited and adrenaline started to build up. I knew what the sound of water was — a new streamway.

'I yelled back to Edd, "Get the others, this goes, I can hear a streamway." The others were already at the top of the last pitch and did not want to come back down. I said to Edd, "You have to come through, I think I found the main streamway." So Edd came through and we explored towards the noise. We turned a corner and there was some really good formation — the best in the cave so far. We found a way around it to avoid walking on it then found a round, pure white 'flower' — it looked like a small 50 mm round formation with petals on it; a splash formation. We continued until we came to a climb down of about 4 m and we could see water splashing. We climbed down and found the Active Streamway, a nice little stream with waterfalls, running down a clean washed channel, but the passage had flood debris on the roof. One would need to be careful in wet weather, I thought. The streamway had at least the amount of water flowing down Deep Creek on the surface. We then explored downstream in the streamway with the raging water bringing the cave to life and making the adrenaline pump.

BOREHOLE!

'After following the Active Streamway we eventually climbed down a small water-

JOSH SMALL

Skeleton in the passage between Rockfall Chamber and Wrays Room — possibly a koala. Depth is over 100 m below the surface,

fall and came to a sump. After going back to the crawl through to the Rockfall Chamber, I said to Edd "I wonder if there's a higher-level passage that bypasses the sump." Edd said, "Turn around and have a look at that borehole behind you." I turned around and sure enough there was a borehole.The passage is an old streamway about 2-3 m high, 3-4 m wide with great scalloping on the walls and ceiling. BOREHOLE! Both very excited, we walked down the passage for a couple of hundred metres, shouting "borehole" at each other like kids, both of us grinning. We came to a junction — a passage to the right, one to the left; both had nice formation. The left-hand alcove had long straws and a flowstone plate. The right-hand passage had flowstone and a good shawl on the side. We explored the passage straight ahead. We saw a new room up ahead and thought about the others hanging around getting cold and our no scooping policy, so we headed back out. The unexplored room will be there for the next trip.

We exited the cave at 3 am Sunday morning, in the cold, after an 18-hour trip underground. When we got out of the cave it had been snowing; there was about 5 cm of fresh snow at the car. It was one of the coldest nights at Yarrangobilly for the year.

ONE CAVE, TWO NAMES

From the very moment we squeezed through the gravelly slot under the Boulder Mother we knew instinctively that the cave we had found was an extension of the known West Deep Creek (Y-6) system. But the Y-6 entrance had been silted up since at least 2015 and no one had been in that section of cave, probably for quite some years. The only survey available for Y-6 dated back to the 1970s and covered a limited section of the cave. But the circumstantial evidence was strong.

Our survey confirmed that the new passage was not only very close to the Y-6 entrance but actually passed under it. Also, we had a major surface stream disappearing underground and then a similar stream reappearing in the cave. Still, our instinct that this was all part of the same cave had to remain tentative. No connection, either physical or dye traced, had been established to positively link the new system into West Deep Creek.

So, what cave were we in? West Deep Creek? Or had we found another system?

Fortunately, some meticulous survey work narrowed the odds and we were eventually able to establish a physical connection to the surface stream but not until November 2021.

HELICTITES IN RED RIVER

Enter the Surveyor

Typically, acknowledgements go at the end of an article, but if it were not for Edd Keudell arriving on the scene this story may have had a different outcome. Edd was introduced to HCG by Al Caton, who casually mentioned that we had an upcoming trip to Yarrangobilly. Edd was newly arrived from the US and was keen to visit cave areas in Australia.

WHEN THE STARS ALIGN

Edd's story

Edd describes his recollections of the project.

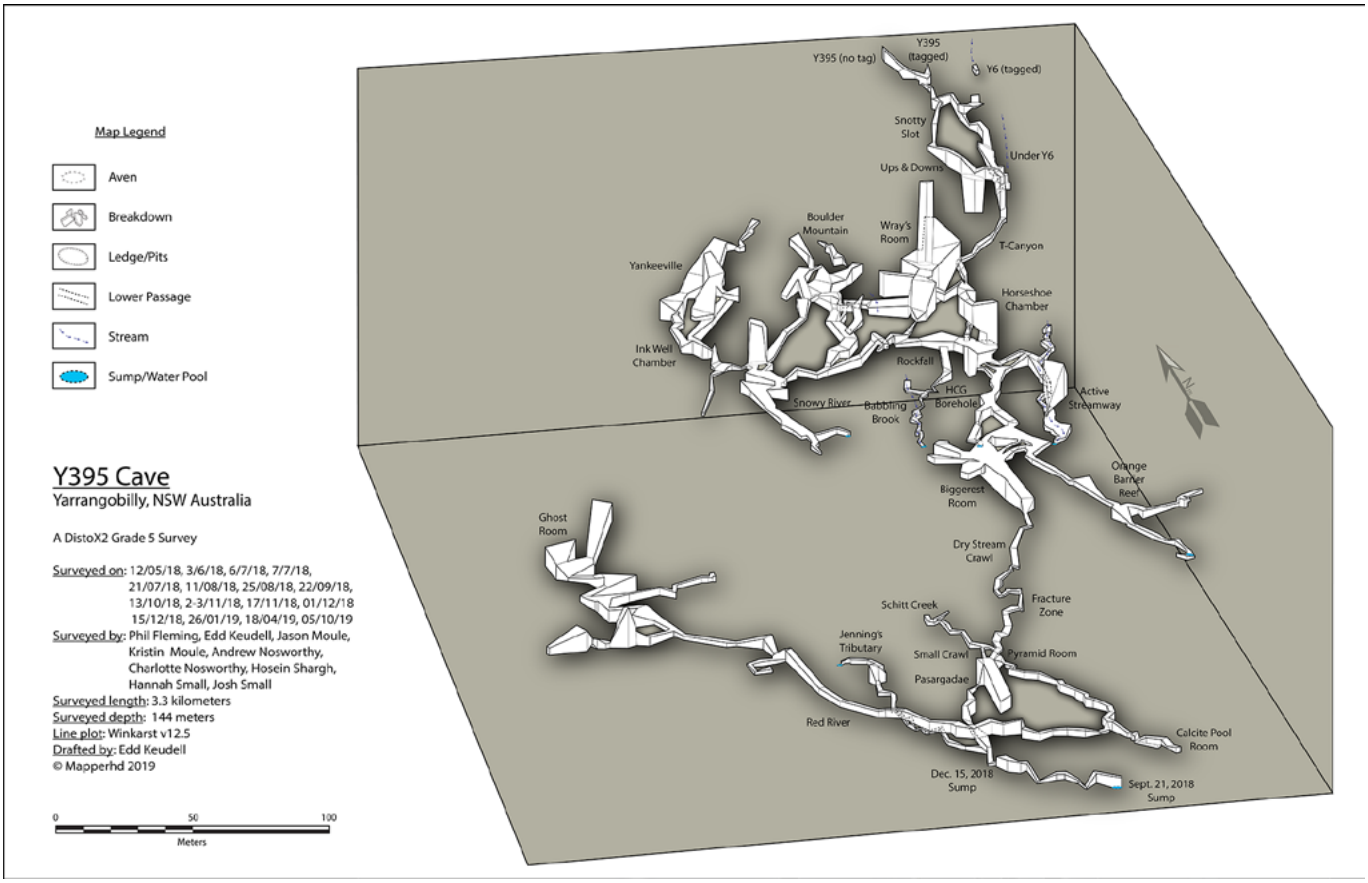
'My wife had received an opportunity through her company to work in Australia for a limited time and I was excited to be able to visit caves on the far side of "the Pond." Being a caver and with the network of clubs internationally, it becomes easy to meet other like-minded people and make friends. So when I packed my bags to fly over I dedicated two of my allotted five bags for caving gear. I had expected to spend my time in Oz as a sport caver rather than project caving like the role I normally perform in the States and Mexico. But my first trip with HCG would put me into an all-familiar role and introduce my soon-to-be new friends the meaning of 'survey as you go'.

I had overheard Jason and the others discussing the blowing air lead in an entrance at Yarrangobilly but I didn't really register its significance until I got into the cave and turned the corner where Jason and Andrew were attempting to squeeze through a small opening that I felt the air sucking into the passage and knew it was going to be a good find. It was when I popped through to the other side of the squeeze, sat up, took out my DistoX2 and book that Phil asked me, "What are you doing?" and I responded, "I'm going to survey," and that I practice the 'survey as you go' philosophy. This would be a phrase I mentioned several more times during the next year.

It was after our second trip via the Y-395 entrance that we needed to involve a couple more HCG cavers I met on a trip into Drum Cave at Bungonia, Hossein Shargh and Josh Small, a couple of younger fellas with rope and technical skills to augment us older guys. The stars had aligned for some unknown reason, but the team had come together and were set to explore and document whatever lay in store for us.'

FRANCES SMALL

The Push Team. Left to right:Andrew, Josh, Jason, Edd and Hossein



EDD KEUDELL

TWO ENTRANCE NAMES, SAME CAVE

Edd continues. 'It was on the third trip into the cave that the Snotty Slot was discovered and opened into true cave passage and not just voids in a huge collapse. It was also this same trip when we first encountered the underground stream.

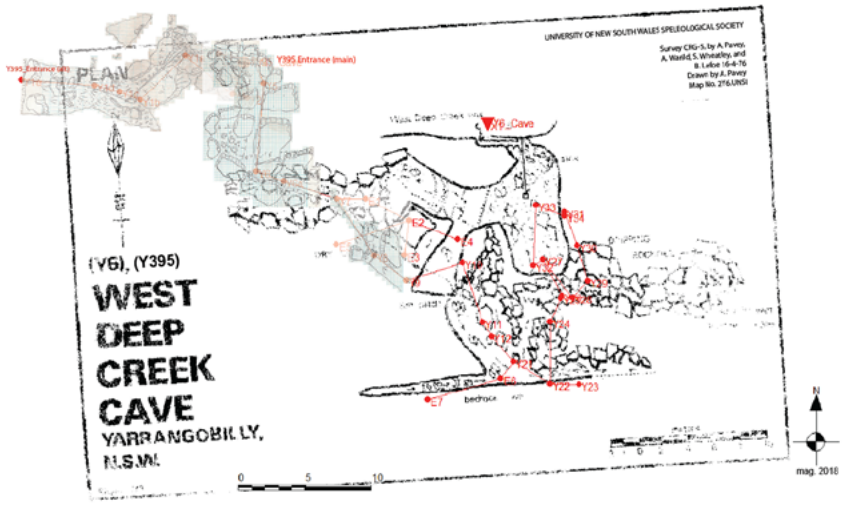
'As previously mentioned, the Y-6 entrance is silted and we noted the water now sinking approximately four metres to the west. While Jason and Andrew were rigging the climb in the now-called the Ups and Downs (American-ese for the Up and Overs).Hossein and I were surveying our way down through the collapse to reach its deepest point. We crawled into a room with a climbable 10-12 metre pitch that looked fairly promising but opted for a less exposed route to get down. It was while we were poking around at the bottom that we started to notice water was dribbling into the rocks and seemed to be increasing visually and audibly.

'When I climbed back up to the spot near the top of the pitch there was water falling over rock face in a solid sheet. To add to the intensity a rather tricky climb-down through the ceiling using a handline now had a full-on garden hose stream flow coming down the side of it. It was at this time that I heard Andrew and our sharing of our most opposite conditions we were facing. We all suspected Y-395 and Y-6 were

JASON MOULE

Helictites in Red River

Fig. 1



HIGHLAND CAVING GROUP

Survey DistoX2 of
entrance level of Y395 by:
E. Keudell, Jason Moule,
Andrew Nosworthy, Phil Fleming,
and Hossein Shargh
Surveyed on: 12 May 2018,
3 June 2018,
& 2 Nov 2018
Plot (red) by E. Keudell
Drafted by E. Keudell

HCG line plot, in red, overlayed with UNSWSS 1976 maps by A. Pavey, A. Warild, and B. Lefoe

Fig. 2

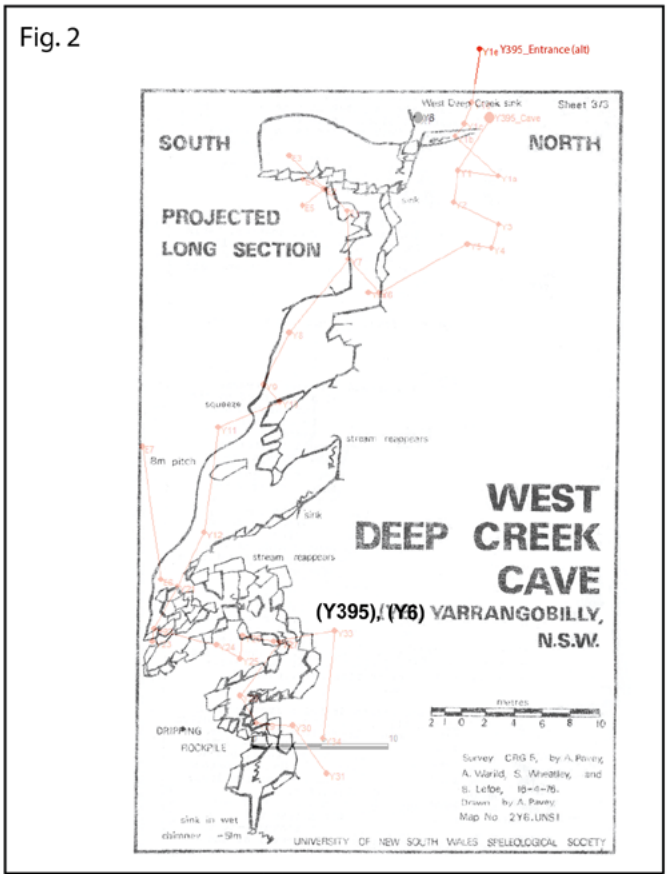
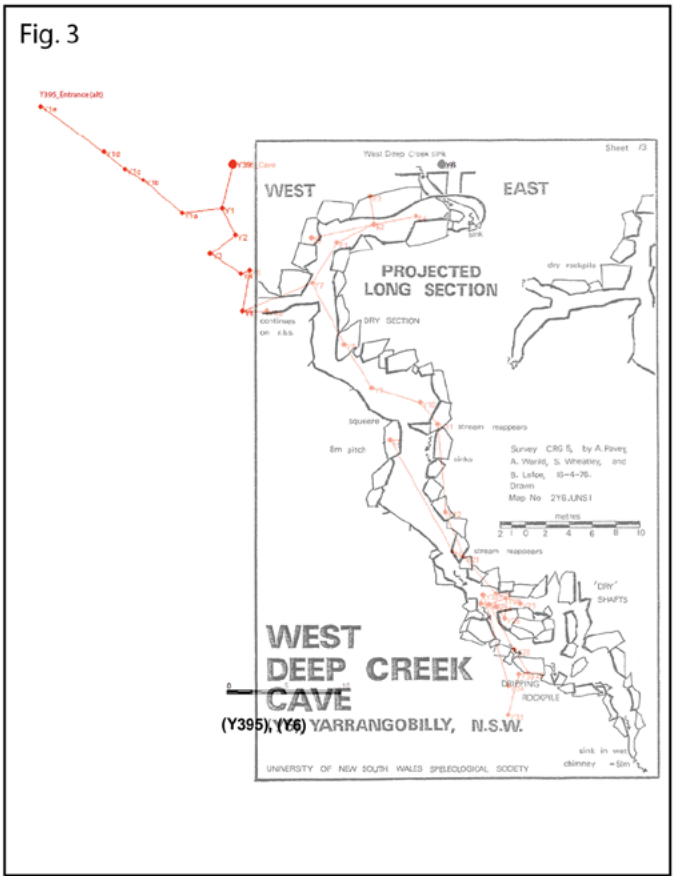


Fig. 3



connected, if not the same cave, but now we had some proof. We knew where the water was going.

'Later, I asked Phil if there were any maps of Y-6 or Y-395 and he said there were but very old. I asked if it was possible to get a copy of the survey data, but in the end I had to make do with the 1976 published UNSWSS survey of West Deep Creek by Pavey, Warild, Wheatley and Lefoe (Pavey, 1976). Al Warild no doubt recognised the potential of West Deep Creek.

'On comparing the two surveys and allowing for differences in surveying tools, caving conditions, magnetic declination, etc. it shows that we had found a new entrance into West Deep Creek Cave!'

'Figure 1 shows our survey (in red) from the main Y-395 entrance and the alternative Boulder Mother entrance, and how it overlays the 1976 Plan view of Y-6. A prominent rift feature on both surveys is near station E6. The 'Vocal Tube' is also near this station. Figure 2 and Figure 3 show the profile of our survey (in red) overlayed with the 1976 map, and the depth reached. Our survey shows we were within metres of the Y6 entrance, but the influx of silt over the years had blocked any further human access. Entering the cave would be through Y-395 from now on.

'It was on the fifth trip we found the Horseshoe Chamber, Wrays Room and Rockfall. Oh, and the HCG Borehole! It was also the trip we found an alternative route to Wrays Room from the bottom (and eventually the way to Snowy River, Ink Well and Yankeeville).

We also quelled any and all possibilities

JASON MOULE

Josh and Hannah in Snowy River

of a 50 Jason-metre pitch dropping into the Horseshoe Chamber. We had reached a depth of 133 metres (not Jason-metres) and were starting to entertain the plausibility of reaching a depth record for Yarrangobilly. We also came to realise that getting out of the cave was a 2 ½ hour endeavor of jumaring, abseiling and contorting our bodies through the T-Canyon and the Snotty Slot (which just got worse and worse). Ahh… out of the cave, finally. Oh, but wait — there's still the trek back up the hill to the cars. This was just an 8-hour trip and we would see trips dragging out to as much as 20 hours later on.'

THE SHAPE OF THINGS TO COME

By this point, HCG had been exploring and surveying the Y-395 system for three months. The trips continued at monthly intervals and many more discoveries were still to be made. Wrays Room was to be surpassed as the biggest room in the known cave. But Wrays Room is still a very impressive chamber with an upper access point (no longer used due to sensitive formations) and a lower access from Rockfall Chamber. It also has the highest aven in the cave of 45 metres and a gnarly breakdown collapse at the upper end.

We were still to find the spectacular 'Orange Barrier Reef', the 'Biggerest Room' and 'Pasargadae'.

Even then, we knew there was more to come and more to find, but bushfires and then COVID intervened in quick session.

The second part of this story, still to come, will describe the exploration of the lower levels of the cave to give a surveyed length in excess of 3.4 km. In addition, conservation and management considerations will be discussed as well as bushfire effects on the doline and cave and the eventual tie in of the surface and underground streams. Not to mention the search for and discovery of further entrances.

ACKNOWLEDGEMENTS

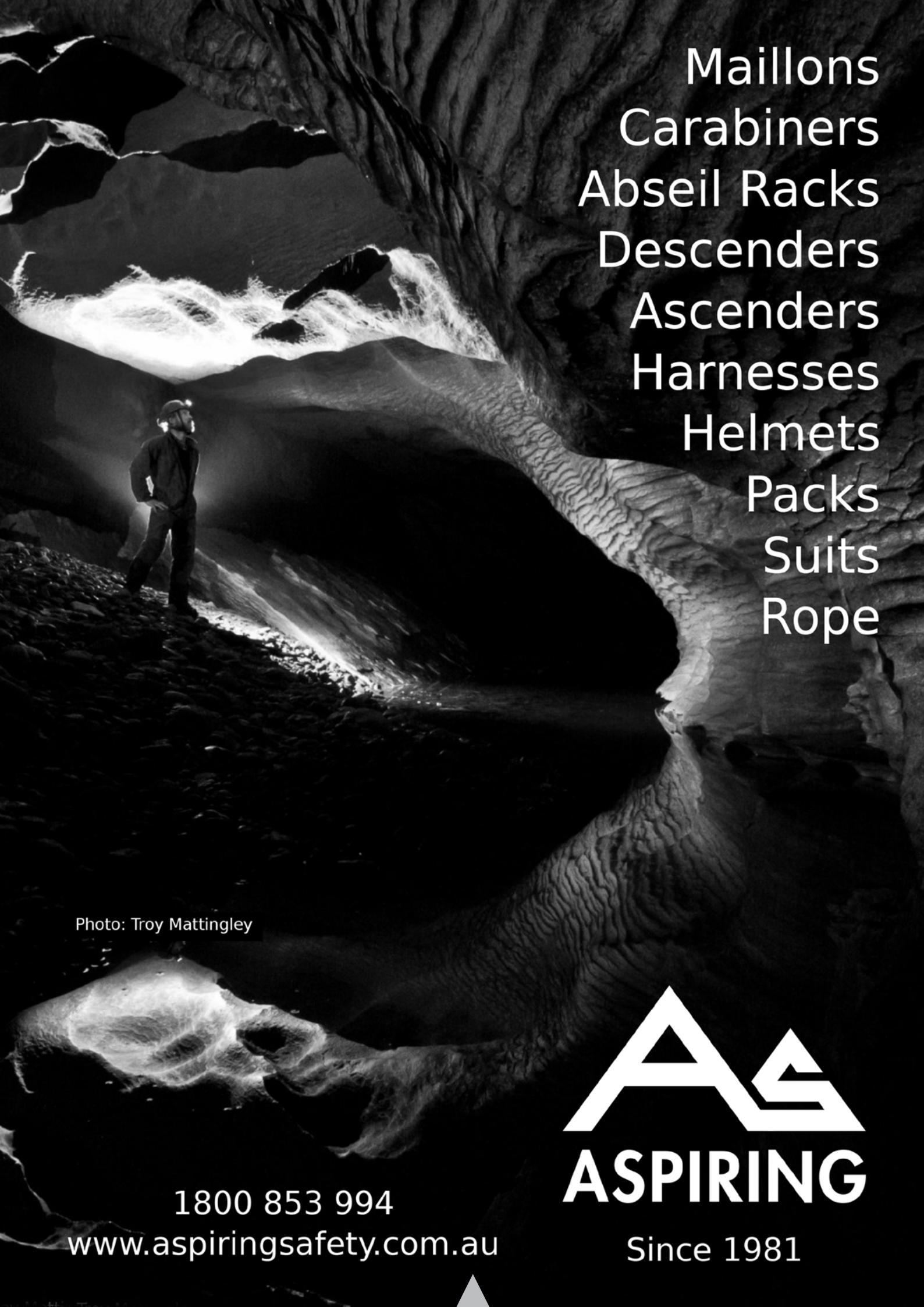
HCG would like to acknowledge the cooperation and assistance of NSW National Parks and Wildlife Service, DPIE, especially Ms Bernadette Zanet and Ms Larissa Lembke of Yarrangobilly Caves Visitors Centre.

HCG acknowledges the financial support of the ASF Karst Conservation Fund and the encouragement of Mr Nicholas White in the pursuit of this project.

REFERENCES

McDonnell, G. (2016). Y395 Boulder Mother Cave [in] Ellis, R. & Halbert, E, (eds), *Caves and Karst of Yarrangobilly* (p. 205). Sydney Speleological Society, Sydney.

Pavey, A. (1976). West Deep Creek Cave (Y6). *Spar* 56, 3-9.


Maillons
Carabiners
Abseil Racks
Descenders
Ascenders
Harnesses
Helmets
Packs
Suits
Rope
Photo: Troy Mattingley
ASPIRING
1800 853 994
www.aspiringsafety.com.au
Since 1981