

One Tree Sinkhole, some might say looks a bit like the outline of Australia.
Drone image courtesy of Damian Bishop.



C.D.A.A. Newsletter

No. 148 - JUNE 2019



CAVE DIVERS ASSOCIATION OF AUSTRALIA

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CAVE DIVERS ASSOCIATION OF AUSTRALIA

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GUIDELINES is a newsletter of the Cave Divers Association of Australia. All articles for the following issue are to be sent to the Publications Director, Email: publications@cavedivers.com.au

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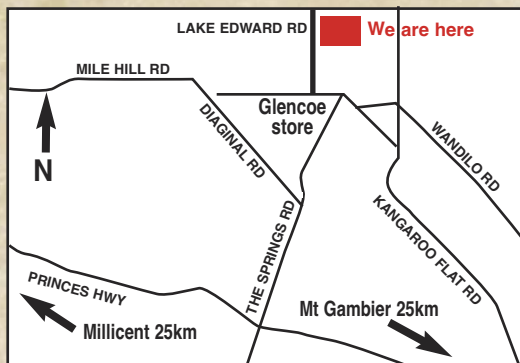
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EDITORIAL MEGGAN ANDERSON



Dear members

Welcome to another edition of Guidelines. It has been really great over the last couple of months to get some articles and photos from members, to the point where I now have some to carry over for future editions! Definitely makes life easier and means less scrambling around for material. On the topic of making life easier, I am pleased to officially announce Brendan Moore as our new Records Officer. Brendan has been on deck for a few months now and has proven to be a very fast learner and reliable volunteer. June is a very busy month for the records portfolio with membership renewals and I thank you all for your patience and tolerance during this time. I will also be away for the month of July in Europe so Brendan will be holding the records fort. I will be travelling in Europe and I am looking forward to doing some cave diving in Malta (and yes I will probably have to write an article for Guidelines!).

This edition of Guidelines is jam packed but it also has important information that you as members should be aware of. Be informed to avoid making a mistake as ignorance is no excuse. If you are not much of a reader, then all I ask is that you please read each director's report and Julien Louys article on fossils from this issue. But I am hoping you will also enjoy reading everything else! I also want to encourage you to think about attending our AGM and Symposium in October, we are going to have some great guest speakers of a very high calibre. Having been to OZTek recently, the most popular talks were the ones delivered by CDAA members who delivered at last year's symposium - and you can attend for free.

Warm regards

Meg #4942

Publications and Records Director

Meggan Anderson #4942 | Publications and Records Director
M: 0415 291 904 | E: publications@cavedivers.com.au

Articles for Guidelines Sept. 2019 - Deadline is Aug. 15th

- Send articles and jpeg images by email to guidelines@cavedivers.com.au

Did you know?

You can opt for an electronic copy of Guidelines rather than a paper copy. **Simply login to your CDAA online account**, select the dropdown menu under the My Records tab and click on Update My Details. Handy for those who have multiple CDAA members in their household or for those wanting to do their bit for the environment!

NATIONAL COMMITTEE UPDATE

JUNE 2019

Hi All,

Usually I try to keep my National Committee report positive, and inform members about all of the great things we are currently working towards. But the truth is, the last couple of months have been, by far, the hardest I (and likely any of the members of this committee) have faced. For the most part, the majority of the other projects we've been working on have had to be put on hold.

Dealing with member misconduct is never a pleasant job. It's time consuming, frustrating, and super stressful for everyone involved. Other members tend to be quick to form an opinion and take sides, usually based on rumours or having only heard one side of the story. The process is also seen by some as an opportunity to push their own agenda or throw further allegations into the mix.

I am not going to delve into a discussion about specific breaches, however I would like to use this opportunity to speak very broadly about the responsibilities we share as CDAA members.

"Access is a privilege, not a right". It's a line that has been getting drummed into students for several decades on each and every CDAA course. And yet, there has been one recurring theme amongst most of the breaches we have had to investigate over the last 18 months. That is; adherence to this principle seems to be the first casualty when it conflicts with an offending member's personal interests, opinions or ambitions.

Managing and maintaining site access protocols is undeniably the most important function of the CDAA. Consider the CDAA's aims – "to foster the development, advancement, promotion, mapping, education, exploration, conservation, safety and research of underwater caves and related features throughout Australia". Without caves to dive, the CDAA's aims would be but meaningless words on a piece of paper.

Training, regulations and insurance all serve to reinforce the access arrangements we have in place, but ultimately, access to sites is dependent on one other key ingredient; TRUST.

Landowners and land managers place trust in the CDAA's ability to ensure that our members abide by

certain access protocols when we undertake activities on their land. These access protocols are in place for their benefit, as well as ours. Irrespective of all the other supporting structures we have in place, if our members do not respect and abide by these protocols, this trust will be lost. And we will all suffer the consequences.

In most cases, landowners and land managers provide access to their properties at their own cost. They invest time, resources, and assume a level of risk, often at no gain for themselves, so that we may dive the sites on their properties. We are so privileged to be able to dive these sites. So it is somewhat infuriating to hear of members being disrespectful to landowners and managers, or undertaking activities that undermine the reputation of the association. Such examples of entitled and arrogant behaviour are simply not acceptable.

As individuals, we all have varied personal interests, ambitions and skills. It's when these personal interests are prioritised over our broader responsibilities as members, that problems arise.

As members of an Association, we share a responsibility to ensure that the best interests of the CDAA, the landowners, land managers, and the broader membership, are ALWAYS put first. This is such a small price to pay to reap the benefits of membership, and there can't be any exceptions.

This isn't to say that we can't encourage or support individual members to pursue personal interests or goals. It simply means that we do need to consider the interests of other parties before we pursue our own personal interests.

Furthermore, the pursuit of one aim can't be at the expense of another. For instance, safety shouldn't take a back-seat in the pursuit of advancement. Exploration and conservation ARE NOT mutually exclusive. And we must never compromise our integrity as members, or as an association, for the purposes of promotion. We share a responsibility to accommodate these aims simultaneously. It's a precarious balancing act, but it's not really as complicated as it sounds.

As a general member, there's no need to know the Regulations verbatim. You only need to familiarise

yourself with the rules applicable to the diving you do and the sites you are diving. Follow those rules, look after the sites, and be considerate of the needs of others. That's it. It's really that simple.

In the past 18 months, as a committee we have had to devote several hundreds of hours dealing with the inconsiderate behaviour of a handful of individuals. This is precious time that could have been far better spent furthering the aims of the association and working on projects that benefit everyone.

As a committee, we need your help – the help of our members – to drive a positive culture. Lead by example. Be respectful. Show gratitude to landowners and managers. If you witness or hear of members doing the wrong thing, don't turn a blind eye. Speak up. Tell them to lift their game. Educate them. And encourage others to speak up too.

Once again, I don't like to use this as a platform to rant. But I feel that these are things that needed to be said. The CDAA is reaching new heights. Our membership numbers are the highest they have been in a very long time, and our members are diving more than ever. The buzz and good vibes at OzTek around the CDAA stand was palpable. Cave diving related

subjects were the dominant topics amongst the presentations. And thanks to the recent achievements of some of our very own CDAA members, cave diving has never attracted so much positive public interest. Even more exciting, is that we still have so much more in the pipeline.

As the National Director, I get to witness first-hand the passion and tireless effort that is invested voluntarily by so many people for the greater good of the Association, and it is an honour to be working with such a great team. The CDAA as we know it is the culmination of 45 years of collaborative effort. It's up to every one of us to protect this moving forward.

Warm Regards, Pete
CDAA National Director



Mary-Anne McLeod,
Business Director



Kelvyn Ball,
Site Director



Joseph Monks,
Standards Director



Meggan Anderson,
Publications and
Records Director



As our Financial Year end approaches time is being spent on the Annual General Meeting and Symposium preparations. I have undertaken a full Financial Review in readiness for the 2019 Financial Statements and 2020 Budgets. I encourage everyone to read these when they are made available – and I welcome any questions!

The AGM and Symposium will be held on Saturday 26th October in Mount Gambier. I'm very pleased to announce that our Keynote Speaker this year is Associate Professor David Doolette, a long standing member of the CDAA. Not only is David an avid underwater cave explorer, but also conducts full time research into decompression physiology. David will be presenting on both these topics at the Symposium. If you are interested in learning more about fossils, Dr Julien Louys will be sharing some of his knowledge with us. Julien presented at a Victorian State Meeting last year and had us all captivated – it is well worth seeing.

The remainder of the program is still being finalised,

so please do reach out if you have some suggestions of what you would like to see. And of course, everyone loves a good door prize, so any businesses who wanting to support the day I would be keen to hear from you.

On a more formal note, there are 4 National Committee positions up for nomination. Voting for the positions, and any member motions or constitutional amendments will for the first time be conducted by electronic vote.

In further news, Damian Bishop is stepping down from his duties as Product Officer, after several years of doing a fantastic job in the role (in addition to SA State Rep!). If you want to help out, but don't want to commit to a directorship, this is a great opportunity. We are in the process of confirming a supplier going forward, so keep a lookout for a revamp of Merchandise in the coming months.

Mary-Anne McLeod #5011
Business Director



Hello Members,
Well, it has certainly been a very exciting year thus far as was to be expected with the hype surrounding such an important event on the CDAA's calendar taking place, which was of course-OZTek. As most of you are aware, the entire National Committee were in attendance at this year's event as it is such a big year for cave diving- I am sure this will be expressed in the other directors reports.

As for me, I was fortunate enough to have attended some amazing talks by a number of current and former CDAA members during the OZTek event, and I have to say that I was blown away by the calibre of divers out there, wow- the things that some of these people are achieving is nothing short of amazing and I would personally like to thank them for their efforts and I eagerly look forward to hearing about their upcoming adventures.

One of the most important issues I faced while I was there was former members expressing an interest in re-joining the association. I had some in-depth conversations with people from across the board and I am sure that with the payment of a once-off late fee and some help from the instructor body, most if not all of the people walked away very happy, and ready to be a part of the CDAA again. I can not wait to see them back, once again diving the amazing caves and sinkholes we are so fortunate to have access to here in Australia. To all the people who chatted

with me throughout the weekend, thanks for your time it was appreciated, and I hope your questions were answered.

I'd like to give a special shout-out to two of our prestigious award winners from OZTek 2019, They are both incredible divers, well done- Ryan Kaczkowski for Technical Diver of the Year and Stephen Fordyce for Emerging Explorer Award. On the CDAA home front, things have been going great. There is an amazing team in place, the current directors work effectively together and strive to achieve the best possible outcomes for both the association and its members. There have been a couple of form corrections and adaptations to suit the current direction of the CDAA. The instructors have been on fire running course after course, acquiring new members and progressing members who are looking to upskill their current diving practices. I thank them for their hard work, dedication and for being great role models to our new and old members.

I would encourage all members both new and old to have a look at the CDAA document base so you are aware of any changes and to refresh your knowledge; we all have very busy lives and it is easy to forget things but the document base is a great user-friendly tool and is easy to access through the CDAA website.

Remember to 'dive safe and within the standards.'
Regards , Joseph Monks

WANTED! ARTICLES FOR GUIDELINES...

If you've been travelling lately or dived somewhere spectacular, we want to read about it, so send your story and pictures to us

URGENTLY!



Well what can I say? OZTEK 2019 was pretty exciting for a first timer. Great to see so many CDAA members and committee there. Lots of information to be heard and just a great general catch up with anything diving.

Donation We have had a stretcher donated and will be available for Nullabor trips. Thanks goes out to Ken Smith for this. Looking at storing this in Adelaide somewhere for easy pickup on the way through.

Thank you to members who have sent through positive feedback about the Tank Cave driveway and carpark repairs. Always appreciated and encouraging.

But now I have to put my grumpy pants on. Seems to me we need a few reminders put out about diving etiquette.

Firstly, when booking sites online, please refrain from booking too many sites on the one weekend, Only book the sites you actually intend to turn up and dive at (not just in case bookings) Forestry's are looking at charging for access to sites and at the moment you are just increasing their expectations of what they are going to receive from these sites - so if not diving don't book.

Secondly, The Lady Nelson Tourist Information Centre has informed us that there is a key issue. Please only take the keys for your allocated day

and return ASAP as there is not an endless supply of keys and other divers have not been able to access them in time for their dive slot.

Thirdly, recently a committee member has had to go to Goulden's and clean up used toilet paper that is being left on site. This is **not acceptable** and all divers either bag it or don't use it. Thank you to our committee member for their bravery and ensuring the future access to this site.

Fourthly, Always be courteous and respectful to other divers at all times. Divers exiting from Tank Cave have right of way to those entering and if you are doing Fossils to Tank or Tank to Fossils please let other divers know of your intention to avoid bottlenecking at the Fossils end.

Lastly, Access Officers. Make sure you know the protocols for the site that you have taken responsibility for. Look up changes to Regulations that have been uploaded in the last few weeks. Let the committee know of any issues that arise while divers are under your guidance.

Remembering to take nothing but photos and leave nothing but bubbles. This will ensure that we get to enjoy all our dive sites in the future.

Happy and Safe Diving!

Cheers Kelvin Ball – Site Director

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Notice of 2019 Annual General Meeting, Election of National Committee Members and Voting for Member Motions & Constitutional Amendments

This notice is issued pursuant to Clause 12 of the Constitution and serves to advise members that the Annual General Meeting of the Cave Divers Association of Australia Inc. will be held on

Saturday October 26th, 2019 at the Main Corner Dress Circle, Mt. Gambier, SA.

The Annual General Meeting will commence at 11:00am and will conclude no later than 12:00pm.

This notice also serves to call for:

- *Nominations for National Director, Standards Director, Publications & Records Director and Business Director
- *Member motions
- *Amendments to the Constitution

NOMINATIONS

The Returning Officer must receive nominations for the National Committee positions no later than the close of business Friday, 26 July, 2019.

Mail to: Returning Officer, CDAA - PO Box 9286, Mt. Gambier West, SA 5291

MOTIONS & AMENDMENTS TO THE CONSTITUTION

The Business Director must receive member motions and proposals for amendments to the Constitution no later than close of business Friday, 26 July 2019.

Mail to: Mary-Anne McLeod, CDAA Business Director – PO Box 544, Mount Gambier SA, 5291

Items received after this date will not be accepted nor will any extensions to this date be granted.

ELECTION CRITERIA

Members intending to nominate for a National Committee position must be eligible members of the Association as defined in the Constitution. Nominations should be accompanied by a précis not exceeding two hundred and fifty [250] words detailing skills, experience and achievements relevant to the duties and responsibilities of the nominated position. The responsibilities of National Committee members are contained in the Constitution of the Association. Nominations must be in writing and be signed by the nominee, the proposer and the seconder all of whom must be eligible members of the Association.

POLLING

The polling date close for the election (if required) is Friday, 18 October, 2019.

The election of National Committee members and voting on amendments to the Constitution will be conducted entirely by electronic ballot.

Voting will be conducted via an electronic ballot according to instructions to be sent via email to members. To be eligible to vote you must be a current member of the Association.

Detailed voting information will be provided via email and in the next issue of Guidelines.

Questions may be directed to Darren Walters, Returning Officer at returningofficer@cavedivers.com.au or Mary-Anne McLeod, Business Director at business@cavedivers.com.au

Please note that Australia Post quote 2-6 days for standard delivery from capital cities to Mount Gambier.

AGM / SYMPOSIUM 2019

2019 Annual Symposium Keynote Speaker –

Associate Professor
David Doolette CDAA #1310



Associate Professor David Doolette began scuba diving in 1979 and was introduced to sinkholes and caves of Australia in 1984. During this time he alternated between his university studies and working as a dive instructor, and he developed an interest in diving physiology. He planned and conducted among the first technical dives in Australia in 1993. Since being awarded his Ph.D. in 1995, he has conducted full time research into decompression physiology in academia and for the military, published widely in the scientific and military technical literature, and produced military decompression procedures. He has been a member of the Undersea Hyperbaric Medical Society since 1987 and received their 2003 Commercial Diving Award. He has been a member of the South Pacific Underwater Medicine Society since 1990 where he was the Education Officer for five years. He is a member of the Cave Diving Association of Australia, the Australian Speleological Federation Cave Diving Group, Global Underwater Explorers, the Mexico Cave Exploration Project, and the Woodville Karst Plain Project, and is an avid underwater cave explorer. He has lectured widely on topics related to decompression theory and technical diving.



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A cave diver's guide to fossil discoveries – our obligations

Julien Louys PhD

It is not unusual to come across an interesting fossil find while cave diving in Mt Gambier. Our natural curiosity makes us want to know what it is and how it got there, and instinctively we want to pick it up and take a closer look. However, rules and regulations are in place to protect these finds. It is our responsibility, as cave divers, to be aware of them and act accordingly. Here, I outline what our obligations and responsibilities are.

Federal legislation for protecting all Australian fossils does not exist, and responsibility for looking after our geological heritage is largely the purview of individual states and territories. As such, considerable variability exists in the legislation and regulations that control collection, ownership, and protection of fossils and fossil sites. Some states and territories in Australia can have ambiguous or uneven treatment of different fossil types and their protection in different situations. This is certainly the case for South Australia.

The flooded caves and sinkholes around Mt Gambier

are found on private land, Crown land, Forestry land, and in National Parks. While different pieces of legislation cover each of these different property types, it is understood that all fossils found in South Australia are owned by the Crown as stipulated in the Mining Act 1971. While the Act does not specifically refer to or define 'fossils', fossils will likely fall under the definition of 'minerals'. The Mining Act 1971 defines a mineral as "any naturally occurring deposit of metal or metalliferous ore, precious stones or any other mineral (including sand, gravel, stone, shell, coal, oil shale, shale and clay)" (Mining Act 1971 Pt 1 s. 6). If this definition is accepted as inclusive of fossils, then the legislation is clear over ownership, namely that "the property in all minerals is vested in the Crown" (Mining Act 1971 Pt 3 s. 16). Because the Mining Act 1971 does not specifically refer to 'fossils', it could be argued that fossils don't fall into this category. However, the wording of 'minerals' has been kept deliberately vague, allowing the definition to be set by case law rather than specifically through legislation



Tank Cave (S.Donn)

(Bradbrook, 1987). This allows the term to be given a broad or specific meaning based on the intention in which the word is used (Bradbrook, 1987).

The state repository for fossils is the South Australian Museum, thus, as all fossils technically belong to the state they should be deposited there. However, the South Australian Museum, like all museums around the world, have limited storage and curatorial resources and usually only accept fossils into their collections on the recommendation of palaeontologists. Some fossils occur in their tens of thousands, and not every single fossil ever found needs to be made available for scientific research. Of course, common fossils can be, and often are, of huge scientific value – their richness can be the very thing that makes them valuable. Knowing which fossils are important and need to be properly recorded, extracted, curated, and preserved is the job of palaeontologists.

Despite the relatively ambiguous wording regarding fossil ownership in South Australia, regulations regarding fossil protection are much more explicit. Fossils found on Crown land, such as Fossil Cave and Gouldens Hole, are specifically covered by the Crown Land Management Act 2009. There, it states that a person who, without authority or excuse, damages or removed fossils from Crown land is guilty of an offence (Crown Land Management Act 2009 s. 61 (1)). Regulations regarding fossils found on National Parks, such as Piccanninie Ponds, is even more explicit. Under National Parks and Wildlife (National Parks) Regulations 2016, fossils cannot be removed, displaced or intentionally disturbed (s. 21 and 30). The Forestry Regulations 2013 covers fossils

found on Forestry land. Section 17 states that without authority, one cannot intentionally destroy, damage or disturb any fossil or remove it from Forestry land.

Regulations regarding fossil conservation on private land are not explicitly addressed in any legislation, and hinge on who the caves hosting the fossils belong to. How much of the land under the surface is owned by the landowner is a question without a simple answer. While it is commonly referred to the maxim *cujus est solum*, roughly meaning that everything from the sky to the centre of the earth belongs to the landowner, things are not that simple. Case law over the years has established that this only really applies to subsoil on the property (Bradbrook, 1987). Subterranean caves, formed in hard rock and thus well outside any definition of any soil horizon, do not belong to private landowners but instead to the Crown. Fossils found in caves on private land are therefore covered under the Crown Land Management Act 2009, as detailed above.

The Cave Diving Association of Australia has its own specific set of regulations, and clauses pertinent to fossil preservation can be found in the Member Code of Conduct. Specifically, all CDAA members are expected to understand and apply the Australian Speleological Federation's Minimal Impact Caving Code. This code states that: If bone material is found on existing or proposed tracks, the area should not be disturbed, but be taped off pending consultation with the land owner/manager towards timely assessment of the find. The Member Code of Conduct also outlines the responsibility, shared by all divers, to avoid caving practices that compromise the value, environment, and the surrounds of caves, including fossils.

So what do I do if I find a fossil?

Fossil deposits are a limited resource – they won't be made again any time soon! Each fossil represents a unique snapshot of past life that, once disturbed, can be lost forever. It's therefore in our interests, as well as our responsibility as cavers, divers, and explores, to make the most out of what is found. Information from fossils allows us to build an understanding of what life was like back then – fossil sites are past laboratories where a one-off biological experiment has been run, and all we need to do is read the results. We can't waste this enormous potential, which can literally rewrite our understanding of Australia and our unique biota.



Engelbrechts East - (P.Wolf)

Fossils are not just objects, they are the remains of once living creatures that fascinate and captivate the imagination. For palaeontologists, however, it's often more than the fossil that we're interested in. For us, the context of the fossil find is just as important, if not more so, than the fossil itself. This is one of the primary reasons that fossils should not be disturbed once they're found. If moved or handled, valuable scientific information is lost. We're interested in more than knowing 'what species is it'? We need the context of a fossil to answer questions like: How old is it? What sort of environment did it live in? Is this leg from the same animal as this skull? How did this fossil get here? etc. In many ways, how a palaeontologist approaches a fossil find is similar to how a crime scene is examined. We're trying to work out exactly what happened, and we need as much information for that as possible. Unlike a crime scene, though, we're working on a case that's been cold for thousands if not millions of years. To unravel the mystery behind every fossil, every bit of data counts.

The best thing to do when finding a fossil is to take a picture of it without disturbing it, preferably with a scale (metric is best, but anything whose dimensions are easy to visualise can be used). This will allow a palaeontologist to at least estimate what the organism is, and how significant it might be. If the fossil has already been unintentionally disturbed, where

possible and safe make detailed notes and diagrams and take photos of its original position/location, so that this can be reconstructed. For mammal fossils that have already been disturbed, if the grinding (occlusal) surfaces of the teeth are visible, photographs of these will help enormously with identification to species. However, if taking photos at this angle requires movement of an undisturbed fossil, it's best to leave it where it is.

It's important to note that almost all fossils found in caves have been lying there undisturbed for tens of thousands of years and are thus rarely in any imminent danger. If there is a remote chance that the fossils are at risk of future damage/disturbance, the first step is to make other divers aware of their presence (for example, by using cave line to create a perimeter around the fossil or area, attaching a wet note to a nearby rock). These finds should then be reported to the CDAA National Committee to determine what further protective measures would be suitable. These steps observe the Minimal Impact Caving Code directly and are considered best practice.

If the fossil is in imminent danger of being destroyed or damaged, it's best to move the fossil to a safer, nearby area within the cave. However, the threat of damage to fossils, and indeed to any the cave's values, should never stem from a diver's actions or aspirations. We are but temporary visitors to these places, with the rare privilege of accessing these

unique sites. Above all else we share a responsibility to ensure that our impact on these fragile environments is minimised. If a fossil must be moved, they should be kept submerged if at all possible – the drying out process can damage and could potentially destroy valuable palaeontological information. Again, if moved, detailed notes, plans, and photographs should be taken where possible and safe.

Photographs can be sent to any vertebrate palaeontologist for identification. There are many excellent palaeontologists

working in universities and museums around Australia, and most are happy to help identify fossils and evaluate significance. Determining species from photographs is not an exact science, and it can be difficult to be accurate, however, we can generally get it in the right ballpark. It's important to note that not all fossils should or would be removed from a cave for scientific study. Palaeontologists weigh up the scientific versus aesthetic value of removing a fossil, and oftentimes it's preferable to leave a fossil in its natural state, for people to enjoy, rather than remove and potentially ruin the site.

In short, here are the six key steps to follow when you find a fossil:

1. Do not disturb the fossil and the area around it;
2. If at risk, mark off the area to indicate its presence
4. Take notes regarding location, orientation, to other divers;
3. Take photographs and/or video, use a scale;
4. Take notes regarding location, orientation, and depth;
5. Report the find to the CDAA executive committee;
6. (optional) Approach a palaeontologist for potential fossil identification.

Ultimately, fossils are part of Australian geological and biological heritage. It's heritage that belongs to



Tank Cave (S.Donn)

all of us, and that should be shared widely for all to enjoy. New fossil finds are dependent on the new explorers and pioneers, people who spend considerable time and effort to probe the unknown, who in turn stand on the shoulders of past explorers and their efforts. However, even explorers need to be mindful of the irreversible impact their actions may have on the cave value. It's our duty to make the most of all this effort, and not waste the precious and irreplaceable resources fossils represent.

Note: The information contained in this article is for general guidance only, as the application and impact of laws can vary widely based on the specific facts involved. The information in this article is provided by a professional palaeontologist with the understanding that the author and publishers are not engaged in rendering legal advice or services. As such, it should not be used as a substitute for consultation with professional legal advisers.

Reference:

Adrian J Bradbrook, 'Relevance of the Cuius Est Solum Doctrine to the Surface Landowner's Claims to Natural Resources Located Above and Beneath the Land' (1987) 11 Adelaide Law Review 462, 462



Marsupial Lion teeth - Gouldens (J.Louys)



Fossilised Snake - Tank Cave (J.Bowman)

The most internationally followed cave rescue in history:

THAM LUANG NANG NON, THAILAND

Compiled and Edited by Nivaldo Colzato. Authors: Martin Ellis/UK and Thierry Tournier/France

UIS Adjunct Secretary/Editor of the UIS Bulletin.

Sourced from: <http://www.uis-speleo.org/downloads/uis-bulletins/uisb602.pdf>

On July 10th, 2018, the world breathed a collective sigh of relief when the last of the boys and their soccer coach, who had been trapped by flooding for 18 days in Tham Luang Nang Non, in Mae Sai, Chiang Rai Province, in northern Thailand, were all safely out of the cave. It was the most internationally followed cave rescue in history and the past issue of the UIS Bulletin brought an article by George Veni (USA), UIS President, not related to details of the operation itself but focused on sharing some general thoughts about rescues in general as well as the importance of the international participation for the success of Tham Luang rescue. In that article, on behalf of the UIS, Veni sent deepest condolences to the family of former Thai Navy Seal diver, Saman Gunan, who died as a volunteer assisting with the rescue. He also invited the whole international speleological community to join the UIS in honouring the memory of Saman Gunan and all people who risk their lives bravely to save others, by helping the UIS improve cave rescue methods and in minimising the need for cave rescues in the future.

As a detailed report on the Thai rescue was promised for this current issue of the UIS Bulletin, here we present more information on this highly complex and ultimately successful rescue operation. The focus is not on technical aspects of the rescue but on the efforts of the divers and many other volunteers who made the rescue possible.

Christian Dodelin (France), President of the UIS Cave Rescue Commission, contacted two cavers, authors of two different reports related to the chronology of the Tham Luang Nang Non rescue and who gave permission for their use in the UIS Bulletin. The report below combines and condenses those reports, which were initially published as:

A SUMMARY OF THE THAM LUANG RESCUE

By Martin Ellis (United Kingdom) - thailancaves@gmail.com
Published on September 5th, 2018, updated on October 7th, 2018 on www.thailancaves.shepton.org.uk/rescue-summary
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SAUVETAGE DE THAM LUANG NANG NON

By Thierry Tournier (France) itoune1@gmail.com
Published on Sep 16, 2018 on https://issuu.com/toune/docs/chronologie_du_sauvetage_de_tham_lu

We thank the authors for their support. Photos from different sources are included in this overview. The basic timeline is focused on the British involvement between 23 June and 11 July 2018. All times are Thailand time.

Saturday 23rd June 2018:

The day is sunny. At around 16:00, the young team (12 teenage boys and their football coach) of "Moo Pah" (wild boars) of the Football Academy of Mae Sai, a small town snug against the Myanmar border, enters the cave of Tham Luang Nang Non, located in the forest park of Khun Nam Nang No. With only few lamps, this visit is part of a regular training program aimed at reaching "Tham Lab Lae," a point inside the cave 4 km from the entrance.

The thirteen were:

- Aekkapol Chanthawong - age 25 - (Coach)
 - Pornchai Kamluang - age 16 *1
 - Phirapat Sompiangjai - age 16 *2
 - Mongkol Boonyiam - age 15 *1
 - Adul Sam-on - age 14 *3
 - Prachak Sutham - age 14 *2
 - Na huwat Thakhamjai - age 14 *2
 - Pipat Pothi - age 14 *4
 - Aekkarat Wobgsukchan - age 14 *5
 - Panumat Saengdae - age 13 *2
 - Duangpet Promtep - age 13 *2
 - Sompong Jaiwong - age 13- *2
 - Chanin Wiboonrungruang - age 11 *2 K
- *1: Ban Pa Yang School *2: Mae Sai Prasitsart School
*3: Ban Wiang Parn School *4: Ban Sansai School
*5: Daroonrat Wi haya School K: Kindergarten School

The group progresses to the "Tham Lab Lae," marked "low vault" on the survey of the french Pyrenean Association of Speleology dating back to 1987.



On their return they find the passage sumped at a muddy U-bend just before getting back to Sam Yaek, the junction with Monk's Series. Whilst they were in the cave, 15 mm of rain had fallen in one hour, and the cave had flooded via the Monk's Series.

Then the group eventually found refuge at a high level, muddy slope located 2.25 km from the entrance, which was later named "Nern Nom Sao."

When the team didn't return home, their parents contacted the police who called out the Mae Sai Rescue Unit at 21:00. On arrival at the cave, the Rescue Unit found ample evidence that the boys were in the cave: the backpacks they had dropped, cleats, shoes, their bikes parked outside. But they had zero evidence they were alive.

At 22:00, 14 members of the first rescue party entered the cave. However, they found the cave flooded just past Sam Yaek. Upon leaving the cave, the Sirikorn Rescue Unit in Chiang Rai were called out as they had diving equipment.

Nine days later, British cave divers Rick Stanton and John Volanthen found the group safe and sound.

Sunday 24th June:

At midnight, the Governor of Chiang Rai, Narongsak Osatanakorn, was informed of the trapped party and he arrived at the cave at 01:00.

At 02:00, locally-based British caver Vern Un-

sworth is called out and along with 22 members of the Sirikorn Rescue Unit who enter the cave. However, they are unable to dive through the sumped section.

Thai cavers Noppadon "Taw" Uppakham and Anukoon "Guer" Sorn-Ek are involved with the rescue by the afternoon. Unsworth informs Rob Harper and Martin Ellis, who are in the United Kingdom (UK) about the rescue.

Narongsak, who is in charge of the rescue operations, requests help from the Thai Navy and a team of Thai Navy divers flies up from Sattahip (Chonburi Province) in the evening.

By evening, the international media is starting to show an interest in the story.

Monday 25th June:

02:45 - Twenty divers from the Royal Thai Navy (SEAL) from Sattahip are on site led by Captain Anan Surawan.

The divers go to the sump past Sam Yaek and work on a small muddy underwater hole and eventually get through. However, the Wild Boars aren't there and as the cave soon sumps again the Navy are unable to progress further.

Harper suggests to Unsworth that experienced cave divers are required. Harper knows the cave and he has warned British cave divers Rick Stanton and John Volanthen to be on standby. However, an official callout from the Thai authorities is required so the British cavers email the Thai Embassy in the UK and start to work their contacts to get the official invitation.

Tuesday 26th June:

It starts to rain hard, and the cave starts to flood from Sam Yaek almost back to Chamber 3. This means no further rescue attempts can be made. Over the next couple of days it rains at 6 mm/hr causing the cave to flood almost back to the entrance.

The Department of Mineral Resources start to coordinate the surface work and is in contact with Ellis, who sends them surveys and caving reports. The rescue effort at the cave ramps up and hundreds of people from many organisations are involved.

In the evening, Unsworth hands Narongsak and the Tourism Minister, Weerasak Kowsurat, a hand-written note with the three British cave



British cave divers (from left to right) Richard William Stanton, Robert Harper and John Volanthen join the rescue effort.

diver's names and forcibly points out they need to be called out as soon as possible if the Wild Boars are to stand any chance of being rescued. Weerasak phones Harper in the UK and Harper, Stanton and Volanthen are mobilized to Thailand that evening by the British Cave Rescue Council (BCRC).

Wednesday 27th June:

Rain overnight with a downpour at 04:45 causes the water to rise 15 cm in 1 hour and forces the rescuers back to Chamber 3. Diving teams had re-entered on Wednesday morning, but could make no progress. There is a big effort to get pumps and hoses into the cave.

Teams from the army, police, National Park Department and volunteers search for other entrances and shafts on top of the mountain. The cave floods causing rescuers to retreat from Chamber 3 to Chamber 2. Four Thai Well Water Association workers get trapped in Chamber 3. 19:30 - Harper, Stanton and Volanthen arrive at Tham Luang. They go straight to the cave with Unsworth, but it is flooding quickly and they are unable to get to Chamber 3.

Thursday 28th June:

British divers Stanton and Volanthen unexpectedly find and rescue the four workers from the Thai Well Water Association who were trapped in the cave.

By evening, the cave is sumped 200 m from entrance - between the entrance and Chamber 2 Harper and Unsworth conduct a surface

search at Pha Mi, above the Monk's Series, and find two shafts. The US Air Force Rescue team arrive from Okinawa.

"We will stay until we find them," said Captain Wuttichai, who oversees the Thai Navy's SEAL team who have been trying to reach them since Sunday. "They are healthy, they are young," he says, confident of the survival of the group, "and moreover, they are athletes."

The surface teams looked for possible access to the Monk's Series.

A drone with an infrared camera crosses the massif in search of strategic points for drilling. A drilling point would be found and would allow the evacuation or partial diversion of floodwaters.

A team of dog masters arrives at the site.

Soldiers and police travel the north side of the mountain top to find "crevices wide enough to enter from above." Four entrances are found, but only one was penetrable.

12:00 - a team of Laotian rescuers arrived on site.

13:16 - the rain continued to raise the level of water in the cave.

15:48 - the Department of National Parks (DNP) decides to temporarily ban access to the cave.

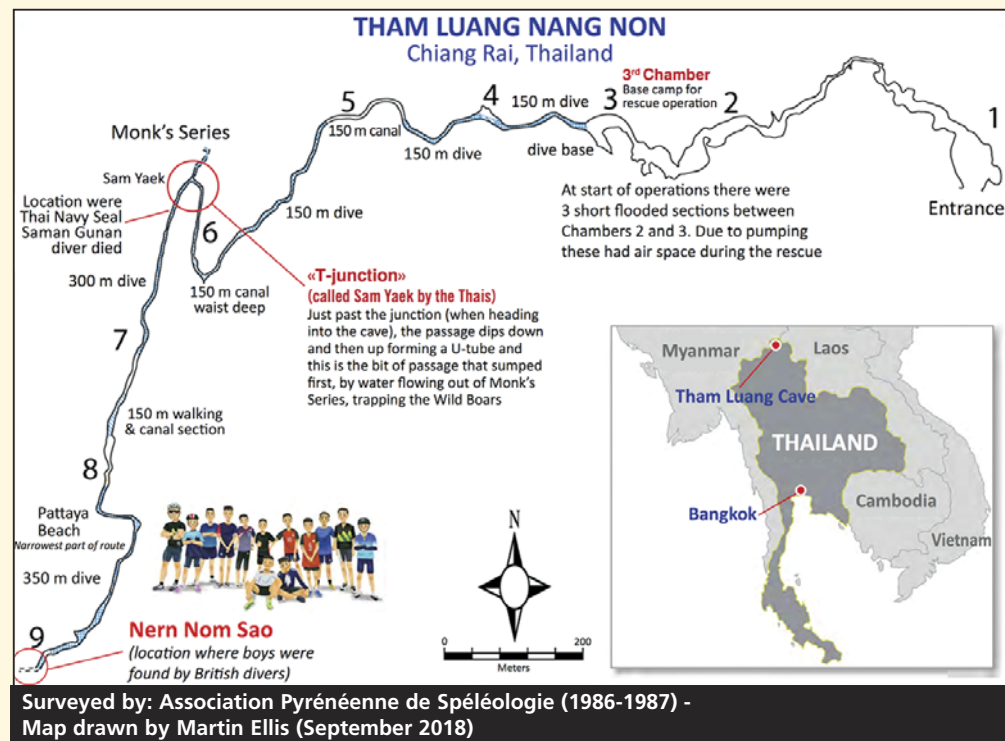
17:00 - Interior Minister Gen Anupong Paojinda announces the beginning of drilling operations by the Electricity Generating Authority of Thailand (EGAT).

Friday 29th June:

As the rain stops, the water level drops in the cave. Prime Minister Prayut Chan-O-Cha made a visit to comfort the rescuers and families, inspiring everyone to remain optimistic and calm.

Thai Navy divers penetrated from Chamber 2 to Chamber 3, but could only get 100m upstream from Chamber 3 due to the strong current.

At Pha Mi, Harper and Unsworth investigated the shafts found on 28 June.



Surveyed by: Association Pyrénéenne de Spéléologie (1986-1987) - Map drawn by Martin Ellis (September 2018)



Water pump on the truck on the way to the cave and working (right): Over a billion litres of water (the equivalent of 400 Olympic-sized pools) were pumped from the cave.

Governor of Chiang Rai, Narongsak Osotthanakorn, informed the media that a 40-m deep shaft was found and that there were others to explore with hopes to reach the cave. Rescuers dropped, or rather dumped down the 40-m pit, dozens of survival boxes of emergency supplies in the hope that they would float toward the group, with the intention that the victims would put them back in the water for the current to carry the boxes back outside. The "boxes of hope" contained sandwiches, cards, a pencil, drinks, candles, lamps, cell phones, flashlights, and a lighter. Each box also contained a message asking for a phone call to the rescue team and to give their location, condition and medical needs. The message also said, "Please, indicate on the map where you are. Everyone will come to help you immediately." At Sai Thong, work commenced to clear the resurgences and pump out the water.



Prospections on the massif aimed to end access to the cave upstream river. Four entrances were found but only one was penetrable.

Six rescuers from the Beijing Peaceland Foundation (China) arrived with an underwater robot.

The Australian Federal Police Specialist Response Group arrived with other SEAL divers. Considering the extent of the difficulties, Burmese, Filipino, Nepalese, and other rescuers were contacted.

Saturday 30th June:

Thai Navy and foreign divers, who include Ben Reymenants, Maksym Polejaka, Bruce Konefe, Rafael Aroush and Shlomi Aroush, slowly pushed upstream. A thick rope guideline was installed along with many bailout cylinders. Harper, Unsworth & Volanthen visited Sai Thong resurgence. The large "Naga" pumps also arrive at the resurgence. The flood water level in the cave continued to drop.

The Chinese Green Boat Emergency Rescue Team, rescuers specialized in rescues in mountainous areas and caves, arrived.

Sunday 1st July:

There was no rain for the past 36 hours. The water levels continued to drop and the underwater visibility improved.

Birds'-nest collectors from Trang arrived to help with the surface searches.

Chinese rescue divers from the Beijing Peaceland Foundation arrived.



At 14:30, Stanton and Volanthen began their dive upstream from Chamber 3. Light rain fell at the cave at 15:50. At 23:30, Stanton and Volanthen returned having pushed their dive line to Sam Yaek.

Monday 2nd July:

One hundred and one farmers are affected by the flooding of farmland from water pumped at Sai Thong. Surface teams started diverting the stream that sinks at the southern end of Tham Luang. Thailand-based diving instructors Claus Rasmussen, Ivan Karadzic, and Erik Brown arrived at the cave. Stanton and Volanthen dove again and pushed their dive line a further 750m from Sam Yaek and reach the boys. At 22:00, Stanton and Volanthen return to Chamber 3 after a 5 1/2-hour trip. Forty minutes later, the news breaks that all 13 Wild Boars have been found alive.

Tuesday 3rd July:

Ben Reymenants, Maksym Polejaka, and Bruce Konefe left Tham Luang.

At 22:00, six Thai Navy and one Army doctor entered the cave to go to Nern Nom Sao and deliver food, medicine and supplies to the boys, including high-calorie gels and paracetamol. Four of them, including Dr. Loharnshoon, volunteered to stay with the boys inside the cave for a week until all 12 were extracted.

How to extract them? There are many difficulties. The point where the boys were found is 2.25 km from the entrance, with 800 to 1,000

meters of limestone above their heads.

The passage leading to them has several flooded sections, some with strong currents, poor visibility and narrow passages, the smallest measuring 38 by 72 centimetres.

Is it necessary to wait four months for the end of the monsoon, with divers providing food and water? Should the group be taught the basics of diving? Find another entry? Drill a rescue well? Lay an oxygen line? Establish a phone line?

Wednesday 4th July:

At 14:30, BCRC mobilised Chris Jewell and Jason Mallinson (divers),

Mike Clayton and Gary Mitchell (cave rescue coordinators), and Martin Ellis (Thai cave expert).

Jewell and Mallinson flew to Thailand on the evening flight. Harper left Tham Luang.

At 21:00, three Thai Navy divers returned to Chamber 3 after being away for 23 hours. Only three could make return journey as they used three of their four cylinders on way in, leaving not enough air for all seven to make the return dive. They took 23 hours for the return journey as they had to rest on their way out.

Thursday 5th July:

Stanton and Volanthen returned to Nern Nom Sao with supplies and an oxygen meter, which read 15%. Their trip lasted 5 hours.

Thai Navy divers, with three stage cylinders each, started to stage air cylinders in what is believed now to be Chamber 5, 6 and 7.

Cylinders were staged in Chamber 6 by four foreign (Rasmussen, Mikko Paasi, Brown and Karadzic, diving in pairs to stage three cylinders each) and, Saman Kunan and one other Thai Navy diver. The Thai divers met Rasmussen and one other foreign diver on their way way in.

Clayton, Mitchell and Ellis took midday flights to Thailand. Jewell and Mallinson arrived at Tham Luang in the evening.

Friday 6th July:

At 01:30, Saman Kunan, a former Thai SEAL diver and rescue mission volunteer, died after

losing consciousness while placing relay bottles. He was posthumously promoted to the rank of Lieutenant Colonel of the SEALs. The King of Thailand would later decorate him with the highest distinction of the Order of the White Elephant.

Kunan's companion diver arrived back at Chamber 3 alone after 15 hours. Other Thai divers then recovered Kunan's body, which was near Chamber 3.

The authorities insisted that the rescue be carried out more quickly, because oxygen levels fell to 15%, below the safety zone of 21%.

10:30 - Clayton, Mitchell and Ellis arrived at Tham Luang.

12:00 - Stanton, Volanthen, Jewell and Mallinson entered the cave with Unsworth and Chiang Maibased cavers Mario Wild and Surachet "Add" Kongsingh to help carry equipment. Stanton and Volanthen only go as far as Chamber 3. Water levels had dropped enough so the dive base in Chamber 3 could now be reached without diving. Jewell and Mallinson dove to Nern Nom Sal taking supplies to the Wild Boars and the four Thai military rescuers.

14:30 - Stanton & Volanthen returned to the surface after their trip to the dive base at Chamber 3.

18:15 - Dr. Richard Harris arrived at the cave from Australia.

18:20 - Unsworth, Wild & Add enter the cave with three members of the US Air Force to look at where to place bolts for highwires, etc.

20:05 - Jewell and Mallinson returned from Nern Nom Sao with a message of apology to the parents of the children written by the team coach as well as the notes from the kids.

20:50 - Narongsak was briefed by the divers.

21:00 - Unsworth, Wild and Add returned from the cave with the dive kit.

High level political meetings began to brief the Thai authorities and receive outline permission for the rescue plan.

BCRC starts to mobilize cave divers Jim Warny from Ireland, Connor Roe, and Josh Bratchley from the UK.

Saturday 7th July:

The authorities now think is reasonable to continue the dives.

More than 100 holes were drilled in the hope of creating a direct link with the survivors. Meanwhile, six people were injured in an accident involving a rescue vehicle.

12:15 - All the rescue divers go to a local swimming pool with Thai doctors to try out face masks, packaging, etc. on local school children.

13:00 - Dr Harris and Challen entered the cave to go to Nern Nom Sao to assess the Wild Boars.

13:10 - Unsworth and Mitchell went to Chamber 3.

13:55 - A team of seven Chiang Mai climbers established high-lines in Chamber 2.

14:45 - Unsworth and Mitchell returned from the cave. Pumping operations continued to

lower water levels before Chamber 3.

15:50 - All the divers returned from swimming pool after a successful testing session.

18:00 - The divers went off to a big briefing for the next day's rescue operation.

18:30 - A full scale walk-through of the rescue plan, with all the divers and support team, was conducted in the car park.

19:15 - Dr. Harris and Challen returned from the cave.

19:30 - Another very high level political meeting began

to brief the Thai authorities, who at 22:45 gave the go-ahead to proceed with the rescue.

Sunday 8th July:

Change of strategy. Evacuation by the flooded gallery is the only solution. After sedation, the boys would be evacuated one by one.

Twelve international divers, 5 British, 2 Australian, 2 Danish, 1 Belgian, 1 Finnish and 1 Canadian, returned to the cave to attempt an evacuation.

08:00 Started to remove the journalists from the cave site to a district council building 5 km away.

08:20 - 09:15 - Diver briefing followed by the medical briefing.

09:55 - Roe and Warny arrived at the cave. Stanton, Volanthen, Jewell and Mallinson go to the US Air Force camp for the final briefing.

10:00 - Stanton, Volanthen, Jewell, and Mallinson entered cave.

10:20 - Dr Harris & Challen entered the cave.

10:30 - Paasi, Brown, Rasmussen and Karadziec enter cave.

11:50 - All divers were in Chamber 3. Four continue further into the cave, with other six to go when ready 13:41 - Roe and Warny headed into the cave to go to Chamber 5 to assist with cylinder changes.

14:45 - Roe and Warny continued past Chamber 3.

15:29 - Heavy shower began, forecasted for approximately 20mm and with a similar amount in the cave's catchment area.

16:50 - Wild Boar 1 reached Chamber 3 with Mallinson.

16:58 - Wild Boar 2 reached Chamber 3 with Volanthen, who stayed in cave until all were out.

17:41 - Wild Boar 1 was out of the cave. Panic occurred at the medical center as the Thai medics couldn't get the mask off Wild Boar 1 as they were afraid of breaking it and the oxygen cylinder was down to 10 minutes of supply. They fetched Clayton and suited him up to enter the medical tent, but before he is allowed in a US military medical Major rushes in, brushes aside the Thai medics, and removes the mask.

17:56 - Mallinson returned to UK dive base from the cave.

17:58 - Wild Boar 2 reached the cave

entrance. 18:46 - Wild Boar 3 reached Chamber 2 with Jewell.

19:04 - Wild Boar 4 reached Chamber 3 with Stanton.

19:12 - Wild Boar 3 was out of cave.

19:30 - Bratchley arrived at Tham Luang.

19:32 - Dr Harris returned to Chamber 3.

19:35 - Challen returned to Chamber 3.

19:47 - All 12 rescue divers were back in Chamber 3.

21:30 - The rescue operations team debriefed followed by a debrief and planning meeting for the divers.

Monday 9th July:

A total of 25-32mm of rain fell in the 24 hours prior to midnight with no rain since.

08:33 - The Thai Medical chief was briefed, who then briefed the Thai leadership.

08:42 - Water levels as far as Chamber 3 continued to drop overnight, despite the previous day's rain.

11:02 - Harris, Challen Stanton, Volanthen,



More than 700 cylinders were used in the rescue, of which more than 200 were left in the cave.

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The twelve boys and their soccer coach described their ordeal at a news conference in Chiang Rai after they left the hospital.

Jewell and Mallinson left Chamber 3 to rescue more Wild Boars.

11:25 - Chiang Mai climbers and Unsworth entered cave to operate the highlines.
 11:57 - Paasi, Brown, Rasmussen and Warny also left Chamber 3 for more Wild Boars.
 12:35 - Roe and Bratchley entered cave.
 15:33 - Wild Boar 5 reached Chamber 3 with Mallinson.
 16:29 - Wild Boar 5 was out of cave.
 17:23 - Wild Boar 6 reached Chamber 3 with Volanthen.
 17:34 - Wild Boar 7 reached Chamber 3 with Jewell and Warny
 18:10 - Wild Boar 8 reached Chamber 3 with Stanton.
 18:23 - Wild Boar 6 reached the surface.
 18:30 - Wild Boar 7 reached the surface.
 Brown, Challen, Dr Harris, Paasi and Rasmussen reached Chamber 3.
 18:48 - Roe and Bratchley reached Chamber 3.

Important Information:

Body core temps of the four children rescued this day was 34.5°C and higher. The water temperature was 23°C and the air temperature was estimated to be 20°C.

Based on the tally board at the cave entrance, between 200 and 250 people are in the cave for the rescue, but only 12 divers went upstream of Chamber 3.

19:30 - Wild Boar 8 reached the surface.
 19:39 - The Chiang Mai climbers and Unsworth exited the cave.

21:00 - The divers met to plan for the next day's rescue. The weather forecast was good until midnight.

Tuesday 10th July:

02:00 - Elon Musk and his team visited the cave to Chamber 3, but without their rescue pod which remained at the temple, away from the cave site, used by the Thai Navy as a base.
 08:00 - A total of 5.8mm of rain fell at Tham Luang from 00:00 to 08:00 and in the 2.69 sq. km Monk's Series catchment area. This was 1mm more than the previous day. This day

would probably be the last weather window to finish the rescue, and it wasn't a big window.

09:00 - The divers had their briefing, and a separate large briefing occurred for the Thai support team.

09:20 - The divers' briefing finished.

10:00 - Harris, Challen Stanton, Volanthen, Jewell, Mallinson, Paasi, Brown, Rasmussen, and Warny entered cave.

11:10 - Roe and Bratchley entered cave.

11:00 - Harris, Challen Stanton, Volanthen, Jewell and Mallinson continued beyond Chamber 3 for the remaining trapped victims.

11:40 - Paasi, Brown, Rasmussen, and Warny followed them, leaving Chamber 3.

12:45 - The rain stopped, with a hint of blue sky.

12:55 - Roe and Bratchley left Chamber 3.

15:16 - Wild Boar 9 (the coach) reached Chamber 3 with Warny.

15:36 - Wild Boar 10 reached Chamber 3 with Volanthen.

16:15 - Wild Boar 9 was out of cave.

16:20 - Wild Boar 11 (the smallest) reached Chamber 3 with Stanton.

16:36 - Wild Boar 10 was out of cave.

16:37 - Wild Boar 12 was detected on the dive line.

17:00 - Wild Boar 12 could no longer be felt on the dive line. Jewell was with Wild Boar 12, but he lost the line. He found an electrical cable which he followed back to Chamber 4. There Mallinson, with Wild Boar 13, went past him. Dr Harris then took Wild Boar 12 and

came out followed by Jewell.

17:04 - Wild Boar 11 was out of cave.

17:49 - Wild Boar 13 reached Chamber 3 with Mallinson.

18:02 - Dr Harris & Jewell reached Chamber 3.
 18:03 - Brown reached Chamber 3.

18:15 - Paasi reached Chamber 3.

18:17 - Rasmussen reached Chamber 3.

18:21 - Roe and Bratchley reached Chamber 3.

18:27 - Challen reached Chamber 3.

18:53 - Wild Boar 12 reached the hospital and Wild Boar 13 reached the cave entrance.

20:46 - Chiang Mai rope access and Unsworth exited the cave.

21:00 - Two Thai military from Chamber 9 reached Chamber 3.

21:02 - Third Thai military from Chamber 9 reached Chamber 3.

21:10 - Fourth and final Thai military diver from Chamber 9 reached Chamber 3. No one was up-stream of this point. At this time, a water pipe coupling breaks causing the water to rise rapidly between Chambers 3 and 2. The ~50 people who were still in Chamber 3, who served as advanced base camps, quickly fell back to Chamber 2.

Wednesday 11th July:

10:00 - The remaining rescuers met at the cave to pack up their equipment. Three vans were needed for all the equipment & people.

13:00 - The last of the rescuers left Tham Luang.

FOREIGN ASSISTANCE:

Up to 20 Australians were involved in the rescue, including Dr. Harris and Craig Challen, who received diplomatic immunity from the Thai government to protect him from potential problems with child sedation. Other international support included:

- 1 Belgian diver - Ben Reymanants
- 1 Canadian diver - Erik Brown
- 2 Danish divers - Ivan Karadzic and Claus Rasmussen
- 1 Finnish diver - Mikko Paasi
- 1 German diver - Nick Vollmar
- 1 Singaporean diver - Douglas Yeo
- 1 Spanish diver - Fernando Raigal
- 6 Beijing Peaceland Foundation rescuers and their underwater robot
- 1 British diver - Tim Acton

- 1 American diver - Bruce Konefe
- 1 French diver - Maksym Polejaka
- 1 Ukrainian diver - Vsevolod Korobov
- 1 Thai diver - Ruengrit 'Pae' Changkwanyuen
- 1 New Zealand diver - Ross Schnauer
- 11 cavers from the British Cave Rescue Council - divers Rick Stanton, John Volanthen, Chris Jewell, Jason Mallinson, Connor Roe, Josh Bratchley and Jim Warny plus surface support Rob Harper, Mike Clayton, Gary Mitchell and Martin Ellis.
- 1 UK caver - Vern Unsworth
- Chiang Mai Rock Climbing Adventures staff Josh Morris (US) and Mario Wild (Austrian) with Thai staff Surachet Kongsingh, Noppadon Uppakham, Aditthep Khamsri, Archan Nawakul and Jarundech Tongnak.
- Thanet Na Sri (Thai/US) - groundwater expert and translator.
- 1 Israeli diver - with communication means provided by Maxtech NetWorks.
- Several Japanese groundwater engineers - including Shigeki Miyakes, a specialist in the Japan International Cooperation Agency in Thailand.
- Several Lao rescuers - from Vietnamese Rescue
- Several Dutch drainage specialists.
- Several Indian pumping experts.
- 36 US Military's Indo-Pacific Command (USINDOPACOM).
- The Czech Republic government was ready to supply 4 pumps of 400 litres/second, but after inspection on the ground it was proved to be unsuitable.
- Volunteers, teams and technical specialists from countries such as Myanmar, the Philippines, Sweden and Ukraine.
- France, which followed the situation very closely, proposed to send a team of Secours Français, but the Thai authorities estimated that adequate resources were already available on the site. Other teams and cavers were about to leave when the rest of the survivors were being evacuated.

FINAL CONSIDERATIONS:

About 10,000 people contributed to the rescue, including more than 100 divers, representatives of about 100 government agencies, 900 police officers, 2,000 soldiers and many volunteers. The equipment included ten police helicopters,

seven police ambulances and more than 700 diving tanks, of which more than 200 were left in the cave. More than a billion litres of water (the equivalent of 400 Olympic-sized pools) were pumped from the cave.

It is worth to mention that the weather conditions were preponderable over the happy end of this long rescue story. It could very well have happened to a team of foreign cavers, coming as part of a monsoon expedition as we have seen in the past.

Thailand does not pass close to climate change. Heavy rains can now fall in the middle of the "dry" period in the north of the country. December 2018 is a good example, with floods, and unusual and very significant rainfall.

In the spiritual field, all the Thai caves are sacred. Buddhist and Animist beliefs are very strong. To the majority of Thai people who have followed this, the happy end of this story is also attributed to the venerable Kruba Bunchum, who will be the only one to deliver the hostages of the princess of Tham Luang. With his prayers, predictions will bring hope to Thai families and rescuers.

Regardless of belief, the Thai people gratefully acknowledge the participation of many people from around the world.

BOOKS ON THE THAI RESCUE:

PRIS AU PIÈGE: L'INCROYABLE - HISTOIRE DES ENFANTS SURVIVANTS DE LA GROTTTE THAI-LANDAISE

By Thierry Falise - Editeur Florent Massot
Available on: [h ps://www.amazon.fr](https://www.amazon.fr)

THE BOYS IN THE CAVE: DEEP INSIDE THE IMPOSSIBLE RESCUE IN THAILAND

By Ma Gutman
Available on www.amazon.com
or www.harpercollins.com

RISING WATER:

THE STORY OF THE THAI CAVE RESCUE

By Marc Aronson
Available on www.amazon.com

THE CAVE: THE INSIDE STORY OF THE AMAZING THAI CAVE RESCUE

By Liam Cochrane
Available on www.harpercollins.com.au

THE GREAT CAVE RESCUE

By James Massola
Available on www.allenandunwin.com



Divers from the rescue mission (from left to right) Chris Jewell, Mike Clayton, Rick Stanton, Lance-corporal Connor Roe, Josh Bratchley, Gary Mitchell and Jim Warny, speak to media after arriving back at London's Heathrow Airport.

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OZTek 2019 Highlights

Compiled by Meg Anderson

OZTek certainly did not disappoint. It was great to catch up with our members at our stand and also talk to former members about rejoining. CDAA members were also well represented in the presentations, photography contest and the awards and the 2019 event definitely had a heavy focus on cave diving. Thanks to all those members who came to say hi and to those who helped out at our stand! Here were some of the highlights:



CDAA National Committee at the CDAA stand: Peter Wolf (National Director); Meggan Anderson (Publications and Records Director); Mary-Anne McLeod (Business Director); Kelvyn Ball (Site Director) and Joseph Monks (Standards Director)

The Tank Cave VR (Virtual Reality) Experience Words Meg Anderson and photos by Ken Smith and Meg Anderson

CDAA members John Dalla - Zuanna (aka JDZ) and Wayne Johnson, felt it was time everyone experienced cave diving at least once... and so, they created the Tank Cave VR Experience, which is a 3 to 5 minute reconstruction of a dive in Tank Cave. A 3D reconstruction from data recently gathered by Richard Harris allowed participants to sample what it's like to dive in Tank Cave.

Participants had the opportunity to fly through a section of Tank Cave, looking up, down and around. They experienced the 'space' in 3D and got to move around, walk up and down the 'corridor' and see all the incredible cave features. Richard Harris also joins you on the dive at some point. JDZ and Wayne were flat out during the whole of OZTek, with their VR Experience proving very popular with old and young alike. It is likely that the experience will have a wider reach in coming months, so keep an eye out.



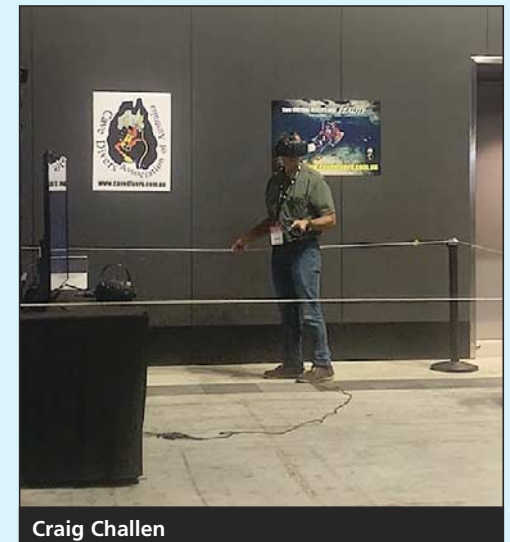
Emerging Explorer Award winner Stephen Fordyce.

CDAA Members Taking the Stage Words and photos by Joseph Monks

A number of CDAA members did us proud and presented. Standards Director Joseph Monks has written a rundown of highlights of talks he attended: Let me just start off by saying that there was certainly no shortage of excellent speakers at the event and it was hard to choose which talks to attend.

1. Cook Islands- Paul Hosie and Bruce Clulow:

I was lucky enough to listen to these two presenting their talk on The Cook Islands, one of them being a former CDAA member and the other is current. They spoke with passion and enthusiasm about their



Craig Challen

incredible discoveries 'over the ditch' and future plans for exploration and cave diving in the region. The presentation was very informative and really showcased the skill, drive and determination of these two amazing divers/ explorers as well as other important cave divers from Australia.

This talk really made it clear that there is so much exploration out there, and with the right mindset and the right people you can discover things that are truly amazing. These guys have certainly been around the block and the sport of cave diving owes them much here in Australia, and they are always on the lookout for new places to explore.

It was great to see the bonds of friendship forged by you guys, with the local community allowing future trips - well done on your success it has been no minor effort. I will not go into the details of their finds as I cannot do them justice but needless to say, if you see them around it is well worth chatting with them about what they found and what they might be up to.



Kids loved the Experience



Wayne Johnson (pictured) and JDZ were the busiest stand throughout the weekend.

2. Cave Diving Fatalities Monitoring and Prevention - Peter Buzzacott

This was a presentation from another member of the CDAA, just fresh off the plane as he has recently moved back here to Australia after living overseas and improving and expanding the safety of the sport



Peter Buzzacott

of diving, not just within the caves. The talk was a real eye-opener, looking at what we need to examine in relation to accidents and incident reporting without concerns of finger pointing and/or shaming for making a mistake.

Peter is looking at the reporting process and the trends within all aspects of the diving curve. Once again, I will not go into detail but I am sure we will be seeing a lot of Peter's work being mindful that it is very important to learn from the past and improve our systems and processes allowing us to move forward in the safest way possible.

I tip my hat to Peter as he investigates the darker side of the sport, yet he still has more enthusiasm than most new divers. I hope we will be seeing more of Peter around the CDAA sites here in Australia and I personally look forward to chatting with him about what he is doing in regard to the future safety of the sport and hopefully developing a data base utilising this information so we can all learn from it.

3. Tasmania - Stephen Fordyce

I have to say that I am biased here as Tasmania is my home and I am always interested in hearing stories both old and new regarding the amazing exploration and general diving/caving around the area.

It was so interesting listening to Stephen Fordyce talking about his encounters in some of the muddiest and coldest cave diving exploration environments. Despite fire ravishing the Tasmanian bushland at the time, Stephen and his team (all CDAA members) endured and dived some amazing caves in Tasmania. He and his team have been working for years to push out the cave systems in some of the most inhospitable cave environments in Australia.

The talk was delivered with the passion of an explorer- a bit rough around the edges but it was exactly what people had come to see. Steve laid it all down as it was



CDAA instructor Jane Bowman introduces Andreas Klocker.

and even included a Batman joke. He is a truly amazing diver and a capable engineer, making all the gadgets we see in varying degrees on expeditions around Australia and internationally with his company TFM Engineering. I believe Steve is writing an article detailing his trip so I won't spoil that, but I look forward to reading some more about your epic adventures mate.

I will close this saying that it was my privilege to have listened to these presentations and I thank the speakers on behalf of all the CDAA members. We will all benefit in different ways from their hard work.

Other noteworthy talks:

CDAA members Richard Harris and Craig Challen's talk on the Thai Cave Rescue was hugely popular, to the extent that surplus people were put in other

rooms to watch it on big screens. Former member Tom Crisp delivered a really interesting talk on the cold caves of Canada that featured having to chop trees, rebuild roads, kayak, walk through snow and avoid bears just to get to the sites. Andreas Klocker also presented on his experiences in Sistema Huautla, as he did at our symposium last year.



Tom Crisp talks about his adventures in Canada, which involved Richard Harris and Craig Challen.



Everybody Needs Good Neighbours

We were really lucky to have our stand placed next to the Tank Cave VR and the friendly chaps from RAID (which included a few CDAA members!). Paul Toomer, co-owner and Director of Diver Training from RAID also visited Mount Gambier to dive our caves as a visitor permit holder. Paul enjoyed his dive in Tank Cave and it left him wanting more!



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Sixteen Legs Premiere in Adelaide

Photos and story by Meg Anderson

CDAA South Australian State Representative Damian Bishop hosted the premiere of the documentary Sixteen Legs in support of the Bookend Trust in Adelaide in May. Damian started his campaign to get Sixteen Legs to Adelaide over a year ago, after hearing rave reviews about it from CDAA members in Victoria. We were lucky to have director and writer Niall Horan in attendance.

Prior to the screening, Damian gave attendees a short speech about the CDAA and Niall then introduced the film. I'll be honest in saying that I had not given too much thought to the title of the film, until Niall introduced it and I suddenly realized I was

about to watch a documentary about spiders making babies. For me, the documentary was also a love letter to Tasmania and featured vast landscapes of natural beauty such as rainforests, snow covered mountains, waterfalls and of course the caves

(which appear to be more decorated than the caves we usually frequent). There was ample footage of dry caving, which featured CDAA member Stefan Eberhard (who also provided commentary throughout the film). The documentary first eased you into the life of all the creatures in the cave (including the behavior of the glow worms, who are not just there to look pretty) and then it focused on the hard and dangerous work of a giant prehistoric male spider when he is trying to mate. If people think they have it bad on Tinder, this guy basically has to make one wrong move and he'll land up dead. The documentary took 7 years to film and 2 years was spent just trying to get the mating sequence. During the Q and A portion after the screening, a certain member of the CDAA (who asked to remain anonymous) posed the question: Evolutionary psychologists use animal behavior as a



Damian and Niall during the Q and A.



Niall chatting to CDAA member Chris Brown during the book signing.



CDAA members Danny Pethybridge and Rowan Blake.



Director Niall Doran and CDAA SA State Rep Damian Bishop.



CDAA members Ken Smith and Richard "Harry" Harris with the director Niall Doran. As the co-recipient of Australian of the Year, Harry will be featuring in a special Science Week event in Parndana on Kangaroo Island with Sixteen Legs.

model for human behaviour. Based upon the behaviour of the spiders in this documentary, can it be assumed that females are inherently evil?" Niall's response to that was that the female spiders definitely control the situation and dominate the story and it was for this reason that a female was chosen to narrate the documentary! The premiere was a huge success and it was great to see many non-cavers and cave divers attend of many different ages. The documentary has been so popular that instead of just one screening, another three have since been added at the Palace Nova Cinema in Adelaide. The film looked fantastic on the Exi-MAX, Adelaide's largest screen. It's great that the power of the people is creating more opportunities for this independent production to be screened.

CDAA SITE ACCESS - www.cavedivers.com.au

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BC = BASIC CAVE C = CAVE AC = ADVANCED CAVE




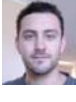





| SITE | LEVEL | OWNER | ACCESS DETAILS |
|--|----------|--|--|
| MT. GAMBIER - SA Ewens Ponds | Nil | DEW | Groups of 6 or more, phone DEWNR on (08) 8735 1177 for booking. Smaller groups, no need. |
| Gouldens | BC | DEW | <p><i>Book online: www.parks.sa.gov.au.</i> Please note that these sites are listed under Piccaninnie Ponds Conservation Park on the website.</p> <p>Bookings must be made a minimum of 48 hours before the actual dive timeslot to allow for DEW to confirm your booking and details. You will receive a booking confirmation email once all indemnities have been received and CDAA qualifications verified. The DEW office in Mt Gambier is open 9am to 5pm, Monday to Friday, 08 87351177 or you can email DEW.SEOnlineBookings@sa.gov.au</p> |
| The Sisters | BC | DEW | |
| Fossil | C | | |
| Piccaninnie Ponds | BC | DEW | |
| Horse & Cart Tea Tree | BC BC | Dale & Heather Perkins Dale & Heather Perkins | Phone (08) 8738 4083 or email dhperkins@bigpond.com at least 24 hours in advance. |
| Little Blue | BC | District Council of Grant | Booking can be made online from www.cavedivers.com.au . |
| Allendale | C | District Council of Grant | Booking can be made online from www.cavedivers.com.au . Obtain key from Lady Nelson Tourist Information Centre. |
| Ela Elap | BC | Dean & Carol Edwards | Obtain key from Management at Bellum Hotel. |
| One Tree | BC | Mr. Peter Norman | Visit the house before diving. If no one is home - no dive! |
| Dave's Cave | C | | Maximum 3 divers all weekends between May & November inclusive (check and update on CDAA website). |
| Hells Hole | BC | Forestry SA | Booking can be made online from www.cavedivers.com.au . Show ForestrySA Permit to obtain key from Lady Nelson Tourist Ctr. |
| Pines | C/AC | Forestry SA | Bookings can be made online from www.cavedivers.com.au . Cave Rated divers cannot enter Advanced Cave Section of Pines. |
| Mud Hole | C | Forestry SA | Bookings can be made online from www.cavedivers.com.au |
| Nettle Bed | C | Forestry SA | Bookings can be made online from www.cavedivers.com.au . Show ForestrySA Permit to obtain key from Lady Nelson Tourist Ctr. |
| Stinging Nettle Cave | AC | Forestry SA | Bookings can be made online from www.cavedivers.com.au . Show ForestrySA Permit to obtain key from Lady Nelson Tourist Ctr. |
| Iddlebiddy | AC | Forestry SA | Bookings can be made online from www.cavedivers.com.au . Show ForestrySA Permit to obtain key from Lady Nelson Tourist Ctr. |
| Kilsby Sinkhole | BC | Kilsby Family | Bookings can be made online at www.cavedivers.com.au Email: kilsby@cavedivers.com.au |


CDAA SITE ACCESS - www.cavedivers.com.au

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| SITE | LEVEL | OWNER | ACCESS DETAILS |
|--|-----------|--|---|
| MT. GAMBIER - SA (continued) The Shaft | BC/C | Trevor Ashby | Booking can be made online from www.cavedivers.com.au . Landowner mandates Dive Supervisors (with their own Insurance) leading all dive trips. |
| Engelbrechts | | Mt Gambier Council | Booking can be made online from www.cavedivers.com.au . Obtain key from Lady Nelson Tourist Information Centre. Diving should be avoided after heavy rain due to possible water contamination. Diving hours are now restricted to 8am to 8pm CST. |
| - East - West | C AC | Lessee: Ph: 08 8723 5552 Owner: | |
| Three Sisters Access available for | AC | Wattle Range Council | Download Indemnity from www.cavedivers.com.au and email to council@wattlerange.sa.gov.au . A \$30 processing fee can be made over the phone on (08) 8733 0900 after Council has received your indemnity. Allow 4 wks for indemnities to be processed. |
| Tank Cave | AC | CDAA | Bookings can be made online at www.cavedivers.com.au Booking Officer is Noel Dillon Email: tankcave@cavedivers.com.au |
| Baker's Cave | C | Janet & Bruce Saffin | Bookings can be made online at www.cavedivers.com.au Booking Officer is Matthew Skinner. Email: bakerscave@cavedivers.com.au Climbing equipment required. One member must have previous dive experience at site. |
| NULLARBOR - WA | | | |
| Cocklebidy | C/AC | WA Dept of Parks & W'Life | Apply in writing for permission to dive at least 4 weeks in advance of trip to: |
| Murra El Elevyn Tommy Grahams | C/AC C | WA Dept of Parks & W'Life WA Dept of Parks & W'Life | District Manager, PO Box 234, Esperance, W.A. 6450. Phone: (08) 9083 2100. |
| Burnabbie | AC | WA Department of Lands | Apply in writing or email for permission to dive at least four weeks in advance of trip. |
| Olwogin Cave | AC | WA Department of Lands | Miss Shannon Alford, E: Shannon.Alford@dph.wa.gov.au Department of Lands, Planning and Heritage, P.O. Box 1143, West Perth WA 6872. Phone: (08) 6552 4661 Fax: (08) 6552 4417 |
| Weebubbie | S/C | WA Department of Lands | P.O. Box 1143, West Perth WA 6872. A site indemnity form must be filled out for each visit to the site. Form can be downloaded from the CDAA website. Diving permission acknowledged by official letter from Land Owner. |
| WELLINGTON CAVES - NSW | | | |
| Limekiln (McCavity) Cave | C/AC | Wellington Caves Management | Access coordinated by Greg Ryan Email: giryan@gmail.com Ph: (02) 9743 4157 Both Cave and Advanced Cave Level are being accepted for this site depending on its water level at the time. When entrance is under water, Advanced Cave Divers only! |
| Water (Anticline) cave | C | Wellington Caves Management | Access coordinated by Greg Ryan Email: giryan@gmail.com Ph: (02) 9743 4157 Affected by high CO ₂ levels during Summer/Autumn. |



CDAА INSTRUCTORS

| NAME | Basic Cave | Cave | Adv. Cave | NAME | Basic Cave | Cave | Adv. Cave |
|--|------------|------|-----------|---|------------|------|-----------|
| NEW SOUTH WALES | | | | VICTORIA Continued | | | |
|  FEATONBY, Tim (CDAА 3327) Worworing Heights, NSW Mob: 0402 129 253 E: tim.featonby@hotmail.com | Yes | Yes | Yes |  EDWARDS, Chris (CDAА 2247) Mob: 0417 116 372 Email: chrisedwards01@me.com | Yes | | |
| SOUTH AUSTRALIA | | | |  McDONALD, Warrick (CDAА 1882) Mob: 0408 374 112 E: info@oceanandivers.com.au | Yes | Yes | Yes |
|  MAIN, Robert (CDAА 4909) Mob: 0411 519 825 E: rob@reef2ridge.com | Yes | Yes | |  MONACO, Rubens (CDAА 1731) Mob: 0413 429 533 E: info@idcscuba.com.au | Yes | Yes | Yes |
|  PAYNE, Timothy (CDAА 2640) Mob: 0448 147 927 E: Tim@diveessentials.com | Yes | Yes | Yes |  MUSCAT, Tim (CDAА 4557) Mob: 0422 127 802 E: tim_muscat@bigpond.com | Yes | Yes | |
| VICTORIA | | | | WESTERN AUSTRALIA | | | |
|  ALLEN, Terri (CDAА 3483) Mob: 0419 176 633 E: terri.allen@monash.edu | Yes | Yes | Yes |  BICANIC, Josip (CDAА 4691) Mob: 0412 571 779 Email: joseph_b@me.com | Yes | Yes | |
|  BARCLAY, Gary (CDAА 1735) Mob: 0407 527 921 E: garinda@bigpond.com | Yes | Yes | Yes |  PAYNTER, Geoff (CDAА 3784) Mob: 0407 445 112 E: gpaynter60@bigpond.com | Yes | Yes | Yes |
|  BOWMAN, Jane (CDAА 1880) Mob: 0407 566 455 E: janelbowman@hotmail.com | Yes | Yes | Yes | QUEENSLAND | | | |
|  CLARIDGE, Linda (CDAА 2214) Mob: 0408 052 070 E: garinda@tpgi.com.au | Yes | Yes | Yes |  HODALIN, Dominic (CDAА 4782) Mob: 0418 870 202 Email: dominic_hodalin@yahoo.com | Yes | | |
|  DALLA-ZUANNA, John (CDAА 236) Mob: 0407 887 060 E: jdz@paintandcustom.com.au | Yes | Yes | Yes | | | | |



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