Speleo Spiel 456

July-September 2023

Newsletter of Southern Tasmanian Caverneers Inc. ISSN 2208-1348

STC Office Bearers

President: Janine McKinnon
Ph: 0427 889 965
jmckinnon@caverneer.net.au

Vice President: Chris Sharples
Ph: 0408 396 663
chris@sharples.com.au

Secretary: Russell Fulton
Ph: 0427 956 297
FultonRL@bigpond.com

Treasurer: Karina Anders
Ph: 0478 228 639
karina_anders@hotmail.com

Equipment Officer: Alan Jackson
Ph: 0419 245 418
alan.jackson@lmrs.com.au

Librarian: Greg Middleton
Ph: (03) 6223 1400
ozspeleo@iinet.net.au

Spiel Editor: Janine McKinnon
Ph: 0427 889 965
jmckinnon@caverneer.net.au

Search & Rescue Officer: Jemma Herbert
herbertjemma@gmail.com

Training Officer: Karina Anders
Ph: 0478 228 639
karina_anders@hotmail.com

Archivist: Stephen Fordyce
Ph: 0437 356 322
stephen.fordyce@gmail.com

Public Officer: Ciara Smart
Ph: 0438247337
ciara.m.smart@gmail.com

Webmaster: John Oxley
Ph: 0409129 908
joxley@bigpond.com

Social Secretary: Henry Garratt
Ph: 0474 356 195
hwgarratt@gmail.com

Front Cover: *Possum skeleton, JF-368 Armadillo Pot. Photo: Rolan Eberhard*
Back Cover: *Karina with cookies for all. Photo: Stephen Fordyce*

STC was formed in December 1996 by the amalgamation of three former southern Tasmanian clubs: the *Tasmanian Caverneering Club*, the *Southern Caving Society* and the *Tasmanian Cave and Karst Research Group*. ***STC*** is the modern variant of the oldest caving club in Australia.

Speleo Spiel

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Contents

Editorial

Well folks, I think for the first time ever we have many more pages devoted to interesting articles than trip reports. The articles are quite varied, so there should be something to interest everyone.

The keen-eyed amongst you will even note a Letter to the Editor snuck in there. My editorial life is fulfilled. I knew eventually I would make a mistake that would inspire someone to submit a correction.

It is only a brief note at the bottom of SnS, but I highly recommend that you follow the link to the cave rescue recently undertaken in Turkey. Just incredible.

Stuff 'n' Stuff

Anyone with the time, and money, might be interested in this great opportunity. I have discovered, on previous trips, that lava caves are surprisingly fascinating. It's also a great opportunity to visit Galápagos. Check out their website:

http://www.vulcanospeleology.org/sym21/GalapagosISV2024%20PreliminaryInfo.pdf

21st International Symposium on Vulcanospeleology

(ISV21)

Galápagos Islands, Ecuador – 10th-20th April, 2024

Preliminary information:

Pre-Symposium field trips (10th - 13th April, 2024)

Notes:

Those wishing to participate in the full range of field trip opportunities should plan on arriving on or before 9 April. Arrivals after that date will miss some of the pre-ISV trips.

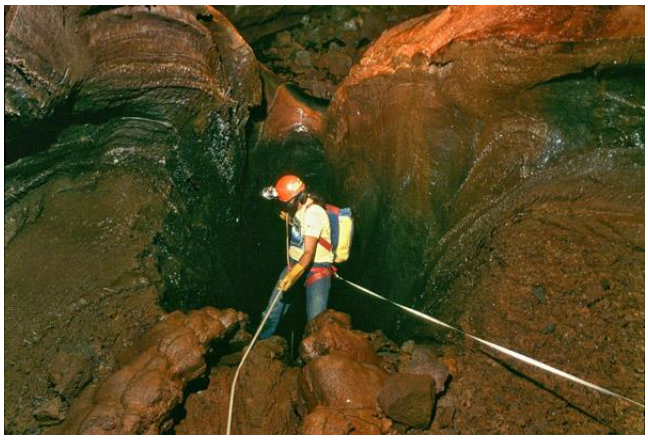
All pre-symposium trips will be day trips to caves on Santa Cruz Island.

All the trips will be for one of the following purposes:

Exploration/ Surveying

Photographic documentation

Science



Random photo of a lava cave. Photo courtesy of Vulcanspeleology website gallery

...and a second one to whet your appetite.

Two interesting facts you may not know: There are such things as iron ore caves, and bat guano is sufficiently corrosive to enlarge them. Of 1500 iron ore caves investigated in the Carajás National Forest, Brazil, only 10 currently house bats. Their analysis showed that the bat caves were nearly 200 m long, compared with regular caves of only 30 m length. That's a lot of bats pooing over a long time (*New Scientist, 27 May 2023)*

Unrelated image for a pretty picture of an iron ore cave. ResearchGate. Article by Stephan Kempe. Photo by Ataliba Coelho.

EXTRA EXTRA!! It's too recent to make it into trip reports, but a seriously impressive new section of decorated cave was discovered on a recent unrelated trip into Porcupine Pot. Those on the trip describe it as rivalling Kubla Khan. Hyperbole? You'll just have to wait and see. Video is online with a link on our Facebook page.

Now there's an incentive to wait in anxious anticipation for the NEXT issue of the Spiel. You could call it an old-fashioned cliff-hanger. They're coming back into fashion I see.

An epic rescue from a depth of 1000 m has just been completed in Turkey. What an amazing effort. Read all about it here: https://tinyurl.com/5n6rwv78

Trip Reports

JF-761 Delta Variant

29 April 2023

Karina Anders

Party: Karina Anders, Henry Garratt, Jemma Herbert, Ciara Smart

Another day another Delta Variant trip. The four of us went off to complete some more tasks to get closer to completing Delta Variant. As we started early, we weren't expecting a super long day so Jemma and I messaged our respective partners that call out was 10 pm. The aim was to finish exploring Snot Monster and continue surveying. Ciara and Henry kindly volunteered to do the surveying so Jemma and I got to push ahead and keep exploring. Once we said goodbye to Ciara and Henry and left them to calibrate her disto, we headed to the pitch head that Henry and I had rigged, now officially called 'Boogie Monster' and down to the rocky ledge where you could see the pitch continue. I rigged this rebelay, a nice 20 m straight down drop. It should be noted that there are lots of loose rocks and it is probably unsafe to have more than one person on the pitch at a time (unless the first person is sitting on the middle ledge and not moving).

The bottom of this pitch only has one way down, through a muddy/slimy hole which looks like it goes in a couple of directions but after closer inspection has one main route, headed down to the right. We followed this very muddy passage which required some crawling until we arrived at a window in the wall on the right. The passage continues maybe a metre or two past the window to an opening into the same chamber. Looking out the window we could see the opposite wall but not the bottom (until we got out onto the pitch). Jemma rigged this pitch, called 'The Black Lung', unfortunately there were very few good options and in the end a big boulder which looked very wedged in was chosen and we descended into the deep dark room. Further sub-optimal rocks presented themselves and some therefore sub-optimal rebelays were put in place. The first was on a big pillar, you need to stay left when descending down to it. After that Jemma made it to a platform and ran out of rope. One side looked like it went so I joined her and we tied the 60 m to the end of the 40 m. Now anyone else had to pass a knot. She then rigged a rebelay to drop the final 8 m pitch. At the bottom here if you went down to the left there looked to be a rocky ledge leading to another pitch. On the right was a massive sloping downward rockpile. We decided I would head down to the pitch on the 60 m and rig the top and see how far it went, Jemma would go check out the rock pile. Once I got to the edge I could see it went down far! I thought it could be the Black Supergiant but it didn't match the description we had been given. So instead I thought we had made a new discovery (getting ahead of myself). I started dropping rocks, Jemma timed them as 7-8 seconds. VERY EXCITING. Jemma then found a different platform further around to the right which she thought would be a better pitch-head spot. So we decided to swap. Whilst she was checking out the big drop, I walked up to where I thought she had been. I must have been slightly further to the left because I walked around a bolder and then saw in the wall glued in P-hangers. A mixture of emotions occurred at this point, the first was disappointment, we were not the first here but it was quickly overcome with happiness when we realised this must be the Black Supergiant, meaning we had connected it to Delta Variant. This was closely followed by elation at the thought of finally finishing Delta Variant. By this point Ciara and Henry were at The Black Lung pitch and I called them down.

Henry: While Jemma and Karina went ahead to rig the new pitches Ciara and I stayed back to calibrate her disto at Superspreader Junction. We began calibration efforts at 1200. The first calibration we attempted had an average error of 0.67 degrees. The acceptable tolerance is normally under 0.5. Thus, the disto calibration fiasco began. Ciara and I spent over an hour and a half trying to get a more accurate calibration. After many attempts the best we got was 0.68. Frustratingly worse than our first attempt. Defeated, we accepted this and began the surveying. We resurveyed the traverse above Daily Cases and the corridor beyond. Ciara on book and me on disto. We continued surveying down the two new pitches to the muddy squeezy bit. Here we decided to stop surveying and move ahead to the others. We grovelled down through the muddy bit and found Karina and Jemma babbling about an 8 second pitch.

Karina: Jemma came back up and I showed everyone the P-hangers. We concluded it was mostly likely the Black Supergiant. We realised at this point, no one had a time keeping device and decided we should probably head out. On the walk back we realised we would miss call out, we started wondering which partner would message Alan first. It was 10:15 pm when we got to the reception tree, whoopsies. It turned out Andie (Jemma's partner) had messaged Alan exactly at 10 pm saying we had missed call out - busted! *(and that's how it should be done; call out time is set in concrete – Ed).* He promptly sent a follow up message upon receiving our communication. All in all, a successful trip with perhaps only one more trip needed! Later in the week we confirmed with Petr who showed us a picture of himself at the top of the BSG. It was indeed the same place.

The clean team. Photo: Karina Anders (selfie)

Weld River track wanderings

20 July (and 16 August) 2023

Janine McKinnon

Ric and I have ambitions of running a club trip to the Weld Arch, surprisingly on the Weld River, sometime this summer. We haven't been there for probably more than a decade and it is an interesting karst feature in potential cave-land. We are also planning to spend a couple of days in the area prospecting.

So we thought a reconnoitre of the track beforehand was a sensible idea.

This has proved to be a slow progress and thus far we have done two days finding our way in the section before the river is reached for the first time. We expect one more day should see this first section of much Horizontal scrub negotiated. Stay tuned…

A less-than-scenic start to the track

Photo: Janine McKinnon

It begins - JF-207 Voltera Swallet

11 August 2023

Stephen Fordyce

Party: Stephen Fordyce, Andrew Wilkinson

JF-207 Voltera Swallet was discovered in the 1980s or so, but apart from being an impressive doline with a medium stream, it didn't go far. However, in 2014, it was explored to base level (a depth of 300 m+) and became a major JF cave, tantalisingly close to the line of the master cave between Niggly and Junee Caves. My first Tassie caving trip was the project wrap-up and de-rig, in winter of 2014 (doesn't time fly when you're doing lots of miserable caving), and suffice to say I was way overconfident, underprepared, and thoroughly broken by the end, to the delight of my mainland caving buddies.

A detailed map and project wrap-up report were recently completed by Alan (*SS*451, p20), and I enjoyed a trip down memory lane, with the added bonus of more experienced eyes. I hadn't realised that the main stream (in a rift passage punching sideways straight towards the master cave line) ended in an uninspiring little sump which had had a single cursory look, in winter, a day or two after a massive amount of rain. Small wonder it was full of foam and debris, and looked uninspiring - definitely worth a look in summer I reckon. The survey data indicates the sump is about 10 m above base level, so is also a possible candidate for draining, if necessary. There are other base level leads worthy of another check, and a mud dig which could be interesting.

The usual crew was keen but hadn't done anything yet, so the easy first trip was ripe for the scooping – sweet! As a shakedown day before the Coelecanth push dive, Andrew (an expat Canadian with expedition caving experience, now living in Brisbane) and I had a productive and not too crazy day track-marking, route finding and rigging the first pitch.

We cleared a few fallen trees from Chrisps Rd to get Andrew's car to the end of the eastern fork. The track to the cave was pretty overgrown and devoid of tapes but wasn't as bad as I remembered (it's mostly flat at least). It took us about 90 minutes each way of painstaking searching and following the wrong tapes but should be more like 30-45 minutes now that we've re-taped most of it. Another more direct route north from the carpark might be worth investigating. On the way we confirmed locations of JF-487, JF-488 and JF-206, and sufficiently failed at navigation to approach the Voltera doline from the wrong side.

In the cave, I had a few half-memories but was very glad I'd obsessively read reports and looked at maps – route finding is not easy. We found 2 concrete screw holes for a Y-hang at the top of the 80 m entrance and that was it, the old holes weren't marked. So, I just did all new concrete screw placements with plenty of rebelays down the pitch. Sadly, near the top, my glove caught on the GoPro housing catch, and the little camera on its second outing made a very fast trip to the bottom. I've actually got it working again, but it sure doesn't look pretty.

From the bottom of the pitch, we located the Fistula, and a bloody awful tight thing it was. I experimented with ways to get through it and managed to get 3 m in – after 15 minutes of struggle to figure out the right technique (stay high!). A session of modern digging might be a good investment. We left an etrier there to confirm to the next rigging party where it was and made our escape from the cave. I've made route-finding and rigging notes, but will put them in the archive for now, and publish when complete later.

There was a discussion on the situation with communal rigging gear before starting this project – there being what might be described as a silly number of caves/projects concurrently rigged. Porcupine isn't far off being finished but needs a summer visit (and I paid for all the gear in there anyway). Niggly/Delta Variant is ongoing, but the Black Supergiant route is set to be derigged after some touristing around the rescue weekend, which will free up a lot of club rope. The de-rig of Dissidence (completed at time of writing) should make plenty more gear available for short term projects. Voltera is intended to be a medium-term project, finished and de-rigged by the end of summer. Of course, all of the Niggly/Delta Variant, Porcupine and Voltera rigs are there to be used by STC members and associates, please just give a heads up.

Who needs a PVC suit when you can wear a garbage bag under your cordura? Photo: Stephen Fordyce

Andrew in the impressive Voltera doline

Photo: Stephen Fordyce

Coelacanth Sump Dive (in JF-36 Growling Swallet)

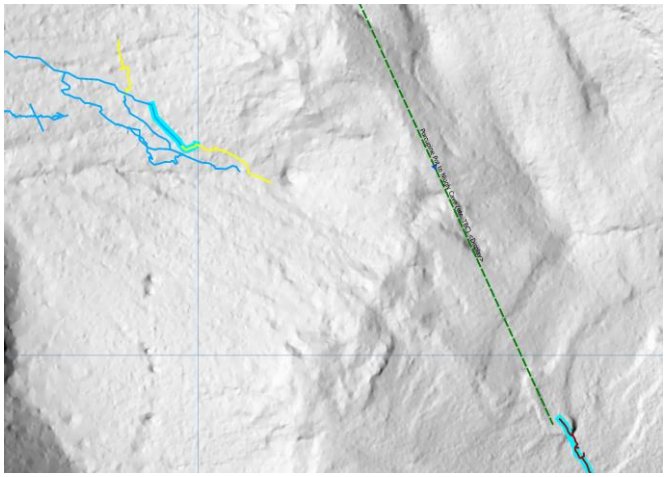
12 August 2023

Stephen Fordyce, photos by Stephen Fordyce unless credited

Party: Stephen Fordyce, Henry Garratt, Jemma Herbert, Alan Jackson, Ciara Smart, Petr Smejkal, Andrew Wilkinson

I'd been keen on a return to Coelacanth Sump since diving and digging it 2.5 years ago (see *SS*443, p11 for various useful background). After the mid-winter madness of the Delta Variant/Niggly connection was so much fun in 2022, this seemed like a good thing to do in 2023 and most of the same excellent crew came along. Winter proved to be a better chance of people not being distracted with other outdoor pursuits, and this particular bit of Growling doesn't seem to be impacted by winter water levels or flooding – which is ironic (and just as well) because it has several roof sniffs.

Coelacanth Sump is worth all the effort of dragging dive gear to because it's one of very few leads going towards the 1.5 km master cave gap between JF-387 Porcupine Pot and JF-237 Niggly Cave. The surface in this area (and associated cave entrances) is covered by glacial sediments. The sump is fed by the Black River stream, which is big enough to perhaps keep a human-passable conduit open. Dry bypasses have been checked fairly comprehensively by various people including me, and the sump feels like it should go (spoiler alert – it does!).



Survey results, showing Growling Swallet in blue, with yellow bits the new passage this trip, and blue background for sump passage. Niggly bottom right in maroon, with line from Porcupine Pot dashed green

So, on a chilly Saturday 7 of us convened in Maydena, dished out vaguely reasonable loads and got on with it. Henry as the youngest got one of the tanks, Petr as Petr got the other (thanks guys), and Alan and I enjoyed not having to be too heroic. Jemma and Henry showed off their ex-Antarctic-division crotchless thermals and Jemma at least had the good sense not to pose for a photo with hers. Henry had better invite us to his 21st… At the Growling main entrance, the water was pumping, the gauge rock inspected, and the conditions pronounced "brown pants" level by Alan, who was in fine form despite his second caving weekend (of three!) in a row.

The Maydena convention

So, plan B was enacted and we went in via Slaughterhouse Pot. The initial squeezy bit was annoying, but we got to the top of the pitches ok. Or at least most of us did – Andrew (despite having done worse squeezes the day before in Voltera) wasn't feeling it and made the reluctant call to pull the pin. After a quick debrief by Petr and Jemma, he was able to find his way back to the cars, transfer my dry clothes into Alan's ute and escape.

The rest of us made cracking time – it's less exciting, but I do suspect the Slaughterhouse route is the better one for access – and were down 5 pitches and through assorted obstacles to be at Black River in under 3 hours. We picked up the dive weights and crawled just shy of the roof sniff, where I insisted would be the best spot to set up the dive gear. The others did what they could, then wisely abandoned me and went back to a large room with sandy floor and ample standing room to get changed into their wetsuits, while I struggled to do everything lying on cobbles with 75 cm floor to ceiling (I'd worried about getting hot and sweaty crawling in my drysuit, but it really wasn't that far).

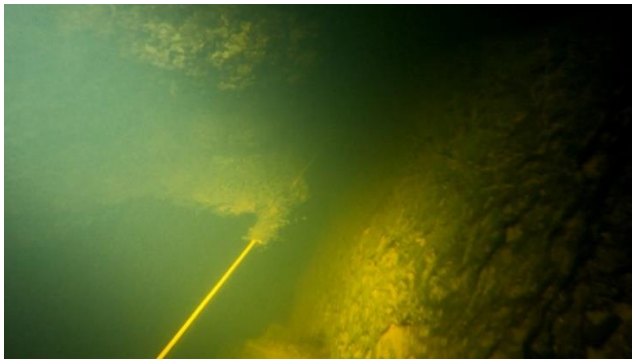
Don't gear up here next time! (photo by Ciara Smart)

Eventually all was ready and into the roof sniff we went (except Jemma, who pottered about by herself at the changing area and by all accounts had a great time). I floated about in my drysuit and neoprene hood and provided moral support by talking about how nice and warm my drysuit was. There was much moaning in the roof sniff and discussion of preferred ways of doing it. We also all forgot there were several more immersions after the first bit. Some of the first-timers discovered the joy of vertigo induced by one ear in 6°C water. It was nice to have help with getting the dive gear to the sump, although it wasn't quite as hard as I remembered, and doing the last bit in 2 trips would have been ok in my drysuit (last time doing the lot at once, I got stupidly hot and quite sweaty).

Petr was an advocate for helmet-on roof sniffing (photo by Ciara Smart)

With cameras rolling in both directions, fist bumps and ceremonial scoffing from Alan (notably absent from dive trips since 2019), I disappeared into the murky water and the others left to hit up leads in Living Fossils. It was about 2pm at this point. We had agreed that the cutoff to be back at the sump pool was 4 hours (6 pm), with a half hour of extra time allowance if things were really happening. A series of bags (bag signals?) left in different places would communicate different scenarios if the sump pool meeting was missed.

If I'd been pleasantly surprised how good the visibility was in summer (3-4 m), I was a bit shocked at how bad it was in winter (0.5-1 m). The mud we stirred up getting there seemed to have been carried through. Oh well, I was probably going to destroy the vis anyway, and had already seen what I needed to see of the terminal restriction. The minor restriction at ~5 m was smaller and more awkward than I remembered (requiring ducking under the guideline), but nothing to worry about. I was pretty apprehensive about pushing the restriction and was deliberately taking things slowly and carefully on the way. It's easy going though, and I reached the room with the last guideline tie-off at 3.5 minutes into the dive.

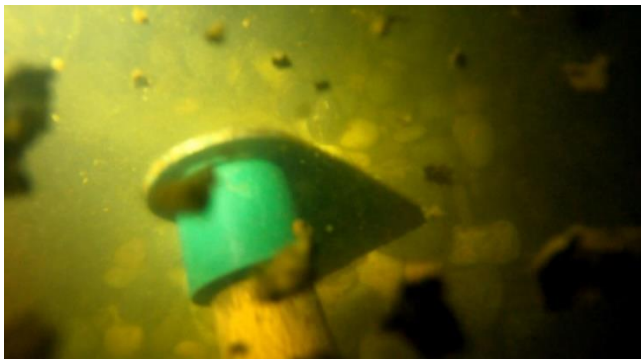


The shallow restriction is made awkward by the placement of the guideline (I ended up having to duck under it)

I tied off my own guideline securely into the loop on the end of the old one, although later got paranoid and realised I hadn't tested whether the loop could pull out. There wasn't much visibility, certainly no view up the restriction, but it was enough to see and feel the loose cobbles choking it. Hard to tell if they had slumped since my clearing efforts in 2021,

I suspect so because it was a bit tight when I had a go at fitting myself through initially.

I was being super cautious and keenly aware of the possibility of it slumping or shifting at a crap time, so I used the small hoe I'd brought for this purpose to for a few minutes. This worked really well, I could get both hands into play (and not trash the fingertips of my gloves), and the slope brought more rocks down automatically, which I cleared down slope into the big room without having to be too committed to the restriction. I could use the hoe to reach forward and gauge the available space and stability of the slope – it seemed ok on both counts, and I knew it was time to push forward. I had planned to commit pretty early or not at all, to give plenty of gas for negotiating the restriction, doing meaningful stuff beyond, and facing it again on the way out. It was a blind wriggle, but the slope was stable, and after a body length the passage was much less claustrophobic – I was through! It was 14.5 minutes at that depth – doing guideline stuff, digging and pushing through.



It's hoe-time!

Beyond the restriction was a similarly sloping (upward) passage about 1 m wide and similarly high, luxury! I saw odd snippets of walls and floor if I was close enough, and noted the floor turned from loose cobbles to silt pretty quickly – at least the stock of cobbles wasn't limitless. The floor flattened (at ~7.5 m depth) then I swam into a wall! The way on was up a vertical shaft roughly 2-3 m diameter – this was beautifully consistent with the "funnel" theory- Ie. fast flowing water could push cobbles up the tight sloping passages, but the slower velocity and higher gradient in the larger vertical section would stop their progress (until they eroded small enough to be carried up and onwards).

Vertical shafts in underwater caves (and just gloomy low-vis mid-water stuff in general) give me the heebie jeebies, especially in low vis and exploring. Shivers. My nerves were pretty jangley from anticipating and pushing through the restriction (and from knowing I'd have to get back), and the cold and proximity to turn pressures wasn't helping. Still, I had enough mojo and reserves left to go a little further – especially as the sump was literally heading straight up, and likely wasn't far from a surface.

Just as my dive computer read "0 m" and I was breathing a sigh of relief, I bumped into a submerged ceiling with some useless little air pockets. How rude. Fortunately, it only took a small bit of feeling around to find a large gap and surface into proper dry chamber and the sounds of the stream burbling off into the distance. The dive had only been 25 minutes but seemed to have taken years off my life. I got out of the water and took a little bit of time to tidy up, warm up, and chin up. The dive gas situation was… ok but mildly nerve-wracking. Accounting for the time spent digging, either tank alone had enough gas left to get me home plus a healthy reserve, but I'd technically gone slightly past my calculated turn pressure, and that didn't sit well. Plan the dive, dive the plan. Next time, I'd factor digging time into the plan.

Alan appreciated the naming of "The Condor" this much (photo by Ciara Smart)

A bunch of nasty dry caving happened over several painstaking hours, in the dry/streamway section named "The Condor" (an awesome bird of prey, and a healthy stroking of Alan's ego for good measure – unfortunately for reasons not appropriate for printing). Sadly, the last of the GoPro battery was wasted on triumphant post-dive yaffling, so you'll have to take my word for it. The way on was not huge but seemed encouraging – the stream could be followed without too much difficulty to a pleasantly sized breakdown chamber (5 m x 5 m). But from here, the cave degenerated into desperately small tubes sculpted by the water into razor sharp spikes.

By inching along at a glacial pace and alternating between swearing and groaning, I got a considerable way into a nasty little flood bypass, and to the point of giving up. However, the thought of backward-grovelling out an unpleasant distance got me a bit further in the hope of being able to turn around. Fortunately, it got a bit bigger and crawling on cobbles in the regained stream never felt so good. Shortly afterwards, I stood up in a large (5 m x 5 m) breakdown chamber with an aven above (interesting, but not very climbable) and a ramping mud rift (which choked out). The stream turned into a wide flat lake which met the low ceiling and felt a lot like the roof sniff back before the sump. Phew, this was probably going to be a good excuse to head for home. The dive gear was safely back at the sump, no way I'd be able to get it in here.

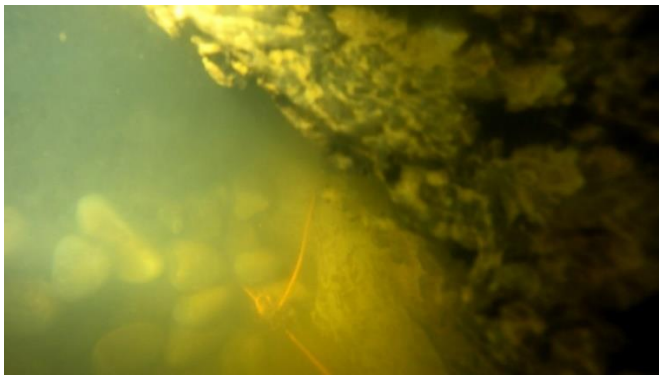
The Condor (just after surfacing) and all its spikey glory

Still, I'd come all this way (total 100 m, over the best part of an hour), and maybe this could be roof sniffed like the other one. At least there was plenty of space – the passage was 2-3m wide and 1 m deep. There was no visibility to speak of and I didn't bother pulling my backup mask out of my pocket. By sticking to the right-hand wall and taking my helmet off, I was able to get through a couple of short but exciting roof sniffs in the truest sense of the phrase – one was even a "water in both eyes" kind of roof sniff. Each one got me into a head-depth airspace running across the passage, with a ridge of rock hanging down into the water between them. At the last, I could feel the next airspace with my foot, but it was going to have to be a duckunder and I didn't have the mojo for that. So, I gratefully turned for home, leaving a pre-labelled tape tied onto a protrusion near the water in the last big chamber, and cracked the DistoX out of its sump canister to survey out. A bonus not-soggy chocolate bar too. On reflection, maybe someone would one day dive The Condor Sump.

Typical inwards visibility (that's a reel with orange guideline bottom left)

Back at the sump, I felt a bit better about getting back into the water – it's always nice to be homeward bound. I attached a commemorative marker (with the initials, messages and crude artwork of the support team) and line arrow to the guideline and surveyed out. The visibility had improved to a pleasant 2 m with all our muddy water apparently having passed through and I could see quite a bit more of the cave (used to flesh out the descriptions above). It was a massive relief to be able to see the approach to the restriction, as it was much less intimidating than it had felt. The curving rock ceiling was actually relatively wide – perhaps 80 cm and the pile of cobbles fell down either side into voids which could be used for pushing rocks sideways.

My impression from the bottom had been of a narrow tube with rock ceiling and walls, with nowhere to push rocks as I grovelled along. It sort of turns a corner, which is also deceptive from the bottom. I could see through to the larger room and that the worst of the restriction was really only 1 m long, with another metre of less tight approach on the uphill side. Knowing this, I would be happy to dial back the restriction cautionometer from "extreme" to "very high" for dives in the near future and to do less pre-digging. You can kind of breaststroke through a loose floor if you can push it to the sides. Kids, don't try that at home (or in an easily damaged cave – this one gets hammered by floods and loose rocks).



The end of the original line in the jumble of rocks at the restriction

The return dive (including survey) was 14 minutes, and a bit soggy – despite my extreme care, the dry caving probably put a nick in my drysuit, or water leaked through a seal. I was up for a bit of gear hauling to warm up from the 6°C water! As usual, the activity had expanded to fill the time available and I was bracing for a lukewarm reception from cold and grumpy cavers as I surfaced in the home sump pool at 6:05 pm – 5 minutes into extra time… But nobody was there – perhaps there was an emergency? Well actually they were off bagging passage (see separate report) and figured bugger Steve and they would take full advantage of the 30 minutes extra time. Fair play guys, nice one! We met at the junction point anyway, and it worked out nicely that nobody had to wait around and get cold.

Back at the gear-up spot(s) we got changed and swapped stories, reunited the bits of stove kit which had been separated (oops) and spent an inordinate amount of time faffing about getting everything packed up, to leave at 8 pm. A freshly-caffeinated Jemma and a regulation standard Petr stormed out of the cave in 2 hours, with a cheerful Alan and chirpy Ciara an hour behind them, and a heavily loaded Henry and fairly wrecked me an hour behind that. The 30-minute walk through the bush saw the last of us reach the car and a sleepy Ciara at half past midnight. In a repeat of last year's shenanigans on the Delta Variant/Niggly Cave connection trip, my dry clothes, shoes, phone and wallet were accidentally taken back to Hobart, rather than to our accommodation in Maydena. Much hilarity and little sympathy ensued.

The gear was washed, the survey data was crunched, detailed sketches were made and Growling Swallet twitched over the 11 km mark. The Condor was now the furthest point in that bit of the cave and wide-open; heading towards the master cave, if someone was idiotic enough to do it. Fortunately, 24 hours after privately vowing never to go back, I was filled with boundless enthusiasm and detailed plans for just such an exercise.

It was a privilege to be able to push through Coelacanth Sump, and I thank everyone who made it possible, including the 35 years of previous explorers, divers and support teams on whose shoulders we stand – it is a success that belongs to all of us. I hope this stupidly detailed report, the GoPro footage and the survey data brought back helps to make it worth your while. As well as those present on the day (listed at top), thanks to Janine McKinnon and Ric Tunney for filling the tanks, and to Andy Terhell for lending his GoPro on very short notice (and Ciara for picking it up!).

Obligatory team photo (L-R: Ciara, Steve, Alan, Jemma, Henry (front), Andrew, Petr)

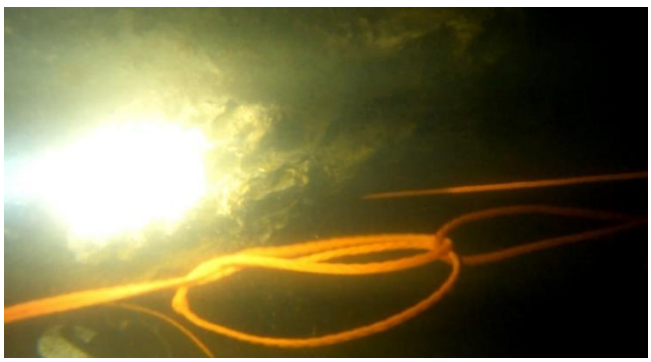
Dive gear used:

- Membrane drysuit, with polypro thermals and Halo3D undergarment, 5mm gloves for the digging at depth.
- 2 x 7 L steel tanks (250 bar cold).
- Mix: Nitrox 32 (nice considering time at depth and post-dive exertion).
- Gas usage:
    - Start: 250/255 bar (3535 L)
    - At far side: 170/130 bar (2100 L remaining, 1435 L used for digging & line placement)
    - Home again: 90/130 bar (1540 L remaining, 560 L used for return & survey)
- 5 x 1.5 kg weights (1 more than previous dive, all left in there)
- Nomad XT sidemount wing/harness, fins.

Surfacing in The Condor with plenty left on the reel (better safe than sorry – running out of line is the worst!)

Thoughts for future dives:

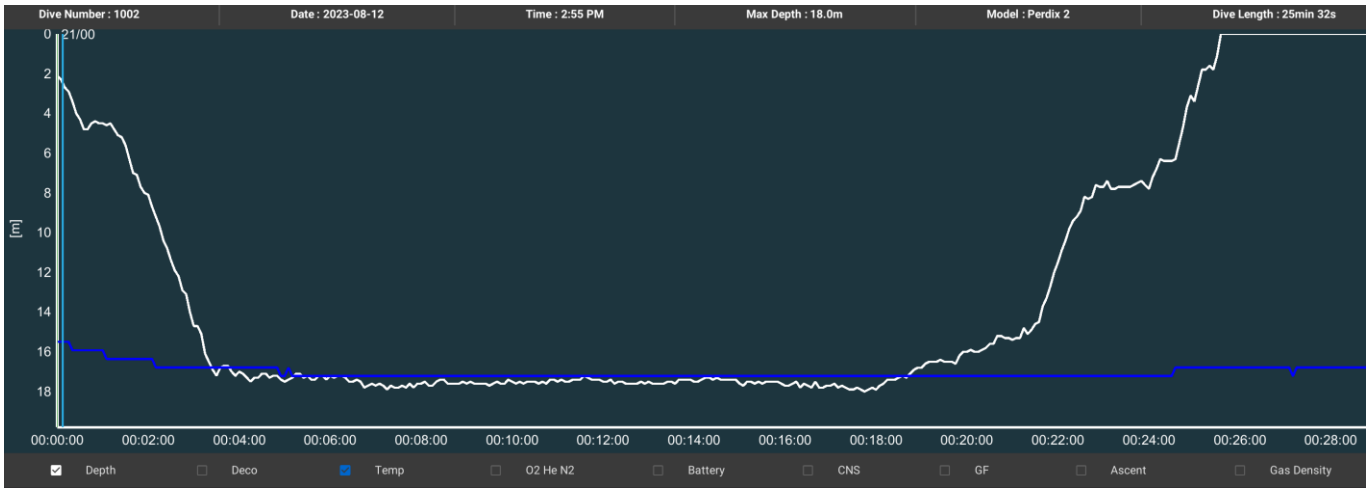
- Get changed further back, in the standing room near the large rock with the weights (5x 1.5 kg threadable, left in there).
- Double check the attachment of new guideline into old one (at deepest point of sump) – that the old loop can't pull out of the knot, or the whole thing unravel if the tie-off rock breaks off.
- Do another tie-off at the far side of Coelacanth Sump (there is only 1).
- Calculate gas/turn pressures with an allowance for digging time.
- Gas/cylinder thoughts: 2x 5 L cylinders (@250 bar, 2500 L of gas) allows a conservative 500 L transit x2, 500 L for digging, and 500 L reserve in each cylinder. Based on my SAC rate of course, and tolerance to cold/suit. Alternatively, 9 L carbon fibre cylinders should have enough for 2 dives, although would be a bit trickier to get through the restriction, and more weights would need to be carried in.
- Suggest taking 2x 3 L cylinders (plugged) through the sump in a caving bag. Then switch regs onto these and use for the 2nd sump.
- Caving bag will help get cylinders/regs, reel and fins to the 2nd sump. Too small to wear them.
- Wear a wetsuit – much easier for dry caving, less critical if holed.
- Do take a wing rather than minimal sump harness with no buoyancy. The vertical section of the dive would be pretty unpleasant without buoyancy and with steel tanks.
- Swapping 2x 7 L tanks for 2x 5 L + 2x 3 L, and drysuit + undergarment for wetsuit, the dive gear load should be about the same – 6 bags.
- Do take a small tool for clearing the bottom restriction, probably don't bother taking it further.



Joining guideline with thick gloves requires nimble fingers

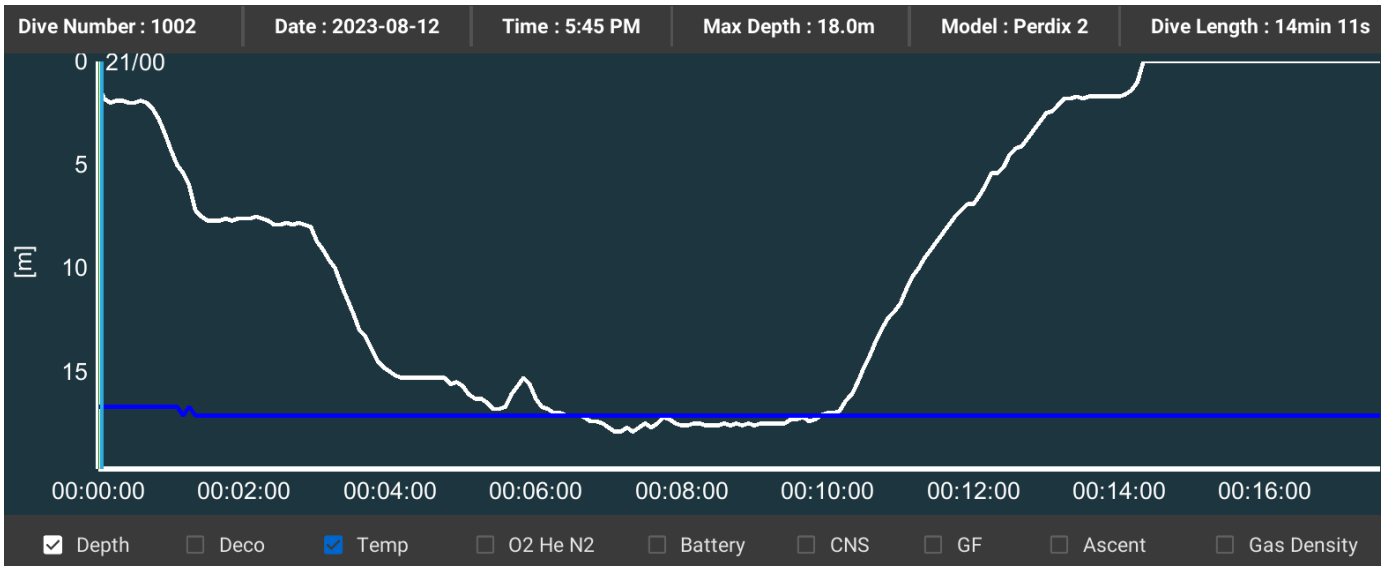
Dive Profile – Outward Bound

Note the hesitation at 5 m to negotiate a minor restriction, then the time spent digging at 17 m. Minimum water temperatures is 6°C.



Dive Profile – Homeward Bound

Note the short safety stop at the end of the dive.



Black Yaris Swallet

13 August 2023

Stephen Fordyce, photos by Ciara Smart

Party: Stephen Fordyce, Henry Garratt, Ciara Smart, Andrew Wilkinson

After a late night getting back from Growling, actually doing anything teetered in the balance, but the promise of tagging new caves got us up Chrisps Rd. A whole new round of negotiation was required as it started snowing as we arrived, but it stopped and we got going. Using the same trick as for finding Delta Variant, I had found a nice new swallet above Satan's Lair in January but not tagged it – it was unclear where the best sink point for the water was.

We stayed high and contoured around through thick but passable saplings, dropping down on Black Yaris Swallet (named for Jemma's car, which got me out of a jam in January) from above. It was cold enough to wear PVC caving suits and be quite comfortable, so Henry was instructed that he had approximately 3 minutes of frenzied digging while we tagged the cave. The sink point was the same as January – down into a tiny hole in limestone rocks in the middle of the canyon – at least 1.5 m from the nearest wall. Half the stream overflowed and continued down the gully/canyon (we followed it 100 m or so to where it pooled, briefly getting excited at a big undercut on the east side). Not super promising, so we tagged it (JF-776) on the east wall and moved on. Not before I joined the frenzied digging and enthusiastically felled a suspended log which was centimetres from also felling Ciara. Sorry…

Steve points at the JF-776 tag while Henry points at the Black Yaris Swallet

We headed up out of the gully onto a ridge and made our way back to the Satan's Lair route, hitting a couple of LIDAR targets along the way, and finding/tagging JF-778 Inauspicious Undertaking – a 2 m deep hole with crack at the bottom only debatably worthy of the tag. Astute observers may notice that we skipped JF-777, which was reserved for a more auspicious cave (a dangerous bet by Ciara, as she may not be there to supervise the placement).

Andrew found the tapes and we made our way back to the car having been away for the promised 3 hours. See – it IS possible.

JF-778 Inauspicious Undertaking is aptly named

IB- 11 Midnight Hole – IB-10 Mystery Creek

27 August 2023

Ciara Smart

Party: Karina Anders, Michael Glazer, Gemma Killalea, Janine McKinnon, Ciara Smart, Abigail Wooll

There's been a bit of a lull in beginner-friendly trips lately, so I figured it was about time for a classic introductory day underground. After an SRT session at Fruehauf, three beginners came along for a trip down Midnight Hole. It had been several years since I'd been down Midnight Hole, so it was very helpful to have Janine along for route-finding and general banter. The first five pitches were negotiated smoothly, but the final pitch proved a problem. I had used a 49 m and 50 m rope for this 49 m pitch. I figured I'd be tempting fate with the rope lengths, but I was reasonably confident we could manage. I tied the ropes together to minimise rope loss in the rigging, but upon descending I was surprised to see the pull-down rope dangling at least 4 m off the ground. The rope I was descending hung about 3 m off the deck. Escaping the rope required a swing onto a ledge, and then a scramble. Thankfully Karina was able to tie our extra rope onto the pull-down rope so we could reach it, and everyone managed the technical finish. Unfortunately, the rope jammed on the pull down. After a great deal of tugging and flicking, it had to be abandoned. We had taken out the knot, and the rope did not appear twisted, so I blame this on the irascible whims of the cave deities. Luckily, I knew there was another trip planned in a fortnight so the rope could be retrieved without too much hassle.

Pre-trip excitement. Photo: Ciara Smart

Everyone managed the Matchbox Squeeze without fuss, and we made suitable noises of admiration at the impressive glowworms in Mystery Creek. On the way out we noticed a smoky odour in Mystery Creek and discovered the remains of multiple firecrackers left within the cave. We took out the rubbish, but the glow-worms can't have enjoyed the light show!

Postscript: Later I measured the ropes and discovered that they had indeed lost a few metres. John Oxley retrieved our stuck rope on a consequent trip. It appeared that the tail had somehow wrapped around itself and formed a neat unmovable tangle through the anchor. See John's picture.

Matchbox Squeeze, always a delight. Photo: Ciara Smart

Well-trained self-tying rope.. Photo: John Oxley

Other Exciting Stuff

Concrete Screw Testing – June 2023

Alan Jackson (photos: Jemma Herbert)

STC started using Hilti 6x65 mm concrete screws as caving anchors circa June 2014 (JF-207 Voltera exploration), not long after cavers in other parts of the world had started playing with them. They offered several advantages:

- smaller holes meant more smaller/lighter drills could be carried and you'll get more holes per drill battery;
- they could be removed entirely so are not left to rust away in caves after exploration (i.e., cave conservation and visual benefits);
- the original hole can be used again for the same sized concrete screw on a later trip, or drilled larger to accept a more permanent rigging solution (e.g., glue-in anchor) – i.e., more cave conservation benefits;
- they can be re-used (if a pitch doesn't go you haven't burned two bolts – just whip them out and use them on the next pitch you find).

They also offered some disadvantages:

- moderately laborious to install by hand (compared to expansion bolts);
- concerns over strength.

From the get-go, we were mindful that dropping from 8 mm to 6 mm was a significant reduction in cross sectional area and that common sense said they'd not be as strong. 6 mm is 56% the cross-sectional area of 8 mm, but while a concrete screw has 6 mm of steel plus the threads, an 8 mm expansion bolt has total 8 mm minus the threads. If we say an 8 mm expansion bolt is effectively 7 mm of cross-sectional steel, then 6 mm is 73% of 7 mm. It's probably somewhere between these figures.

We started cautiously, always placing two screws at each anchor point, but over time we became bolder and started using single screws on anchors where failure wouldn't result in total system failure or a rope rub (e.g., rebelays placed for convenience on free-hanging pitches). With the guidance of Al Warild, following the lead of European cave rescue techniques, we even started using them in our cave rescue rigging (in triple load shares), both in training and in anger (for Midnight Hole and Snowy Mountains cave rescues).

Since 2014 (including cave rescue) I'd guess we've installed close to 1000 screws. We've never had a single failure under load, but a few have been snapped off by overzealous personnel over-torquing them when drill and/or thread cutting dust jams the thread during installation. There have been plenty of naysayers over the years, branding their use as too risky. Some half-decent load testing seemed like a good idea, hopefully to convince the doubters, so after several years talking about it we've finally done some.

A few people have already done their own informal testing. Al Warild threw a load cell and a hand winch on some in 2016, with loads of 1300-1500 kg (approx. 13-15 kN) not resulting in failure when installed properly into competent NSW marble and concrete (Warild 2016). Simon Wilson (UK) tested Multi Monti brand 6 mm screws to failure (in tension only) in 2018 and got numbers in the 24 kN range (Wilson 2018). Seigenthaler & Hof (2019) did a comprehensive study which is worth a read. They found galvanized 6 mm Hilti could break from around 10 kN and inox (stainless) ones generally around 20 kN. I tested some in tension a few years back (pulling directly on the bolt head, not via a hanger) and got numbers in the 15-20 kN range. To reflect how we typically use them, what I really wanted to do was test in shear (which is how they're loaded >90% of the time), in typical Tasmanian limestone and using a hanger and carabiner. Steve Fordyce helped research and source a reasonably priced load cell and modified the digital display unit to run off a battery and extended the cord so it could be placed at a safe distance from the action. Then it sat in my shed for a couple of years …

Last year we welded up a simple steel frame that would allow us to use the Hilti load tester that Parks and Wildlife Service own (which we use for the mandated glue-in anchor testing) in a shear arrangement and trialled the system at an old dolerite quarry in Hobart. In June 2023 we finally got round to having a go in some limestone and run repeat tests thanks to a burst of enthusiasm from Jemma Herbert.

Based on how we've been using them over the last nine years, the questions that I feel need answering are the following:

What does a new screw in a new hole fail at in shear?

What does re-using a screw multiple times do to strength?

Does the inevitable wear and tear on a hole being re-used reduce their strength? (The first time a screw is inserted the thread is hard to cut and the bolt is held firmly but subsequent installations can eventually be done with fingers only, as the thread in the rock deteriorates).

Does using an impact driver over-torque them during install and weaken them?

Does it matter if they're not fully screwed in?

Does it matter if you don't drill the hole perfectly perpendicular to the rock face?

Does leaving a screw on semi-permanent rigging in a cave for years result in a reduction in strength? (Visible signs of rust and corrosion is evident in such scenarios.)

The testing was conducted in the old Junee Quarry in the Junee-Florentine karst area. The limestone there is typical of good quality Tasmanian Gordon limestone. With the exception of one, all tests were conducted with a Raumer stainless steel 8 mm 'Fixed' hanger. In total we tested 36 bolts to failure. The following categories had six replications completed:

- New screw in new hole – installed by hand ('control' group);
- Old screw in new hole – installed by hand. These screws had spent a few years installed in Niggly

and were visibly rusty and corroded, but most hadn't ever cut a new thread, as they'd been replaced into pre-existing holes. ('niggly screws' group);

- New screw in a hole – installed by hand – that had been used three times (i.e., install new bolt in new hole, then remove it, then put another bolt into that existing hole twice more. The result was a hole which had had three screws in it, and a screw which had been in three different holes). ('thrice used' group);
- New screw in new hole – installed with an impact driver. ('impact driver' group);
- New screw in new hole drilled not perpendicular to the face (angled towards the direction of shear load) – installed by hand. ('wonky hole' group).

A few novelty installs were tested to relieve the boredom, also:

- 1x installation in a 'reamed' hole – i.e., overworked with the drill bit in the hope it would make the diameter marginally larger than a typical hole;
- 2x installations very close to an edge (one at ~50 mm from edge and one at ~20 mm from edge). ('edge' group);
- 2x installations not fully screwed in (one at ~10 mm proud and one at ~20 mm proud). ('sticking out' group);
- 1x installation using a manky old, corroded alloy hanger I found abandoned in a cave that had potentially spent decades underground. ('jank hanger' group).

The test site and setup in the Junee Quarry. Left to right: screw and hanger on (under a towel to control small projectiles at failure), chain running from screw to load cell, load cell, welded angle bracket and Hilti load tester, and muscle.

Results

Table 1 contains the raw data, while Figures 1 and 2 graph it.

Failure values ranged from 10.8 to 20 kN. Leaving out the 'novelty' tests (edge, sticking out and jank hanger), failure values ranged from 12.8 to 20 kN. All bolts failed by shearing of the bolt shaft at or just below the rock surface.

Table 1. Raw data. Values in kN.

control	niggly screws	thrice used	impact driver	wonky hole	reamed	edge	sticking out	jank hanger
16.2	12.8	17.8	16.2	17.7	17.3	17.1	10.8	13.9
12.8	15	16.8	16	17.4		11.7	11.8	
13.4	17.9	15.5	17.9	16.1				
17	13.3	17	15.6	17.6				
16.5	20	16.7	19.3	16.2				
16.7	17.6	18.6	17.7	17.4				

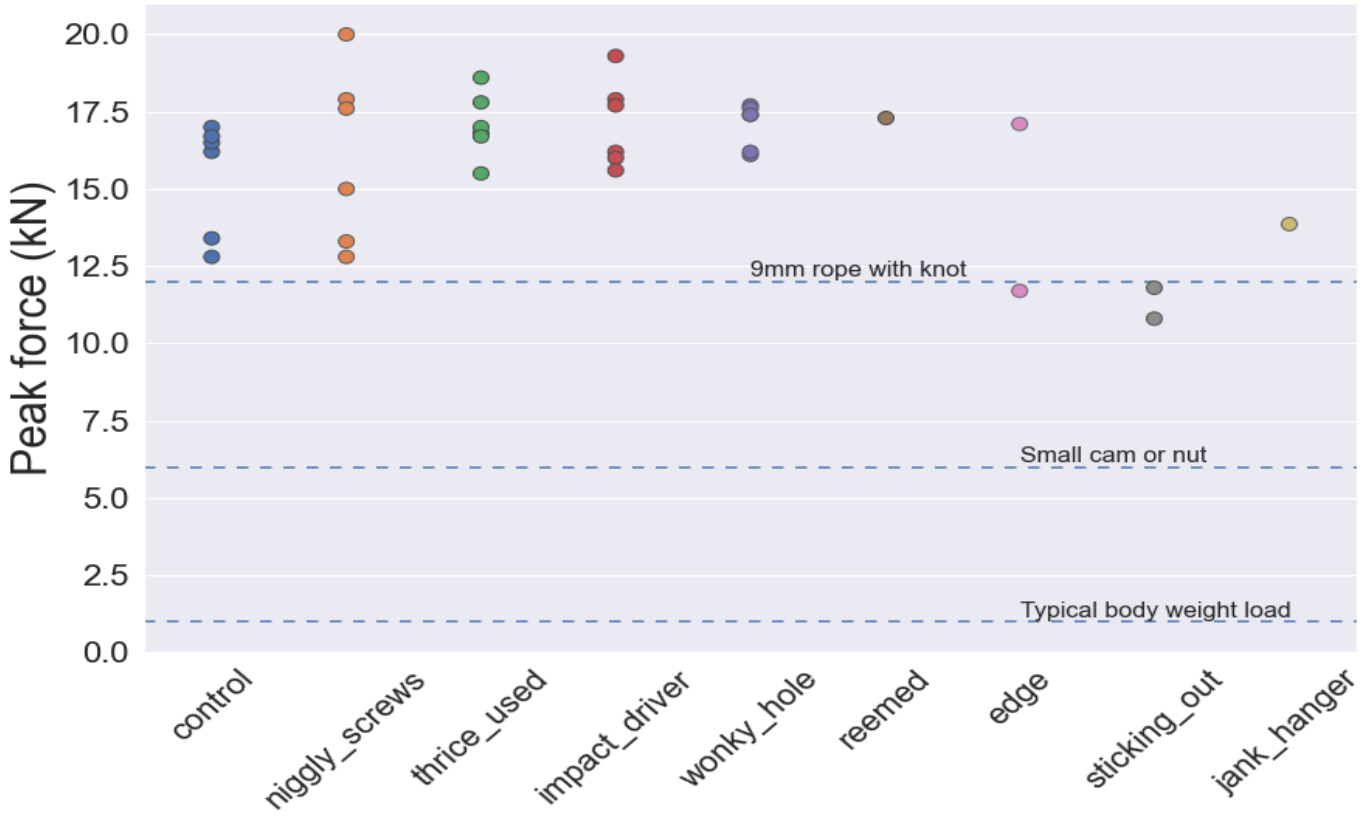


Figure 1. Raw data. Each point is the peak force before breaking the concrete screw on a single test. The dashed lines show other forces and ratings for comparison.

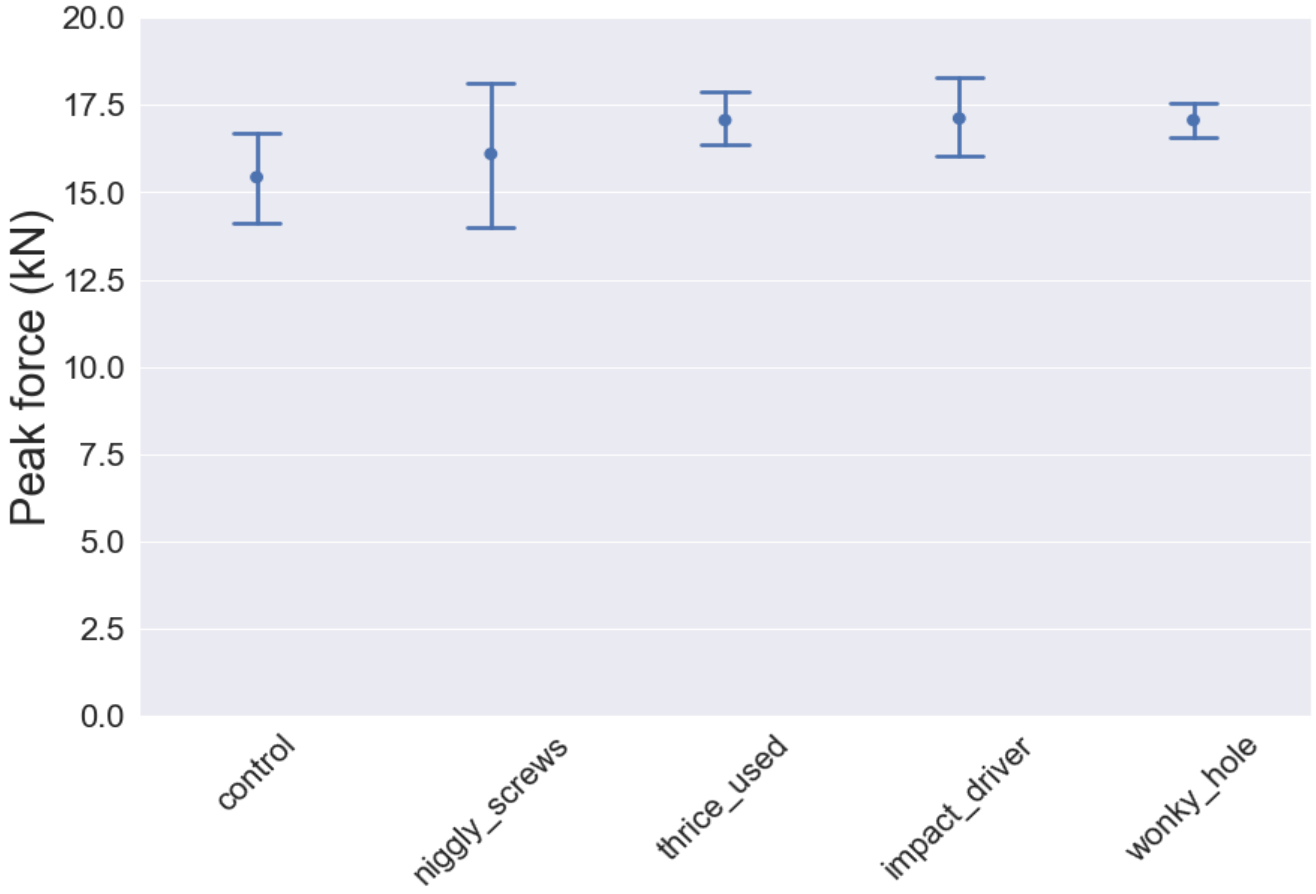


Figure 2. The point is our best estimate of the mean of the population, the bars give a range of reasonable values in which the mean might lie.

Discussion/Conclusions/Thoughts

I'm not much of a statistics man, but Jemma tells me that none of the difference in the results were 'significant'. Focusing just on the five core groups (six tests per group), the results are mostly reassuring.

On average, the peak forces for all groups were similar. We have enough data to be reasonably confident that if there are differences between the groups, they are small. This means concrete screws are quite robust, even to suboptimal placement.

Are the values obtained strong enough?

Table 3.1 in "AS1891-4-2000, Industrial fall-arrest systems and devices, Part 4: Selection, use and maintenance" recommends that any single point anchorage for a 'free fall-arrest – one person' should be designed to 15 kN. For two persons attached to that same single anchor, it's 21 kN. Only 4 of 30 (13.3%) fell short of 15 kN, and not by much. This is a document put together for industry by a bunch of very nervous engineers who routinely double everything to cover their arses.

Pretty much everything else in a caving rigging system is typically stronger than 15 kN. Most hangers, maillons and carabiners have an MBS (minimum breaking strain) of ~20-22 kN (some alloy hangers are ~15-17 kN). Rope is a major variable, depending on diameter, but as an example, Tendon Speleo 9 mm static rope has a listed MBS of 19 kN but a knotted strength of 12 kN. If people are generally happy to swing around on 9 mm rope (even 8 mm isn't unheard of), then 6 mm concrete screws probably shouldn't be upsetting you for recreational caving. Trad climbers regularly throw themselves off cliff faces and hope that micro-cams and small wires/nuts will catch them, and these are typically rated in the 5-10 kN range by the manufacturer (assuming you placed them well).

Tasmania Police's 'Rope Access and Rescue Manual 2014' specifies acceptable anchors for its rescue activities. The following is the relevant extract:

(1) ANCHORS

There are three (3) levels of anchors:

- *Level 1 - Bomb-proof single anchor*
- *Level 2 - Equalised anchor, consisting of a minimum of two separate anchor points*
- *Level 3 - Anchor constructed from artificial hardware*

To assist with determining the level of anchor, the following is a guide:

- *Level 1:*
    - *Solid, healthy tree, with trunk diameter greater than 15 cm.*
    - *Rock, resting on a solid surface, with a minimum size of 0.5 cubic metres, (e.g. 1 m x 1 m x 0.5 m).*
    - *Inherent part of a building/structure, such as structural columns, supports for large machinery, stairwell support beams, brickwork with large bulk.*
    - *Large vehicle, parked perpendicular to load line, with wheels chocked.*
    - *Two equalised & SERENE* level 2 anchors*
    - *Three equalised & SERENE level 3 anchors*
- *Level 2:*
    - *i Solid, healthy tree, with trunk diameter smaller than 15 cm.*
    - *ii Rock, resting on a solid surface, with a size smaller than 0.5 cubic metres.*
    - *iii Parts of a building/structure, which are not structurally inherent, such as a handrail, posts and small chimneys.*
    - *iv Bolts and hangers, such as those used on climbing pitches, or in caves, provided they are designed for the use in which they are employed.*
- *Level 3:*
    - *i Well-placed artificial protection having a minimum rating of 5 kilo newtons.*

(2) APPLICATION OF ANCHORS

a. A rescue load shall have a minimum of three level 1 anchors. These can be made up by three equalised level 2 anchors (6 pieces total), three equalised level 3 anchors (9 pieces total), or a combination. The resultant anchor must pass the SERENE test.

b. A single person load shall have a minimum of one level one anchor.

*SERENE – Strong, Equalised, Redundant, Efficient, No Extension

Based on our own and others' testing, concrete screws could be considered 'level 2' anchors, but one could argue the 'provided they are designed for the use in which they are employed' point – let's face it, the 6 mm Hilti screws are not technically designed for hanging humans off. At a minimum they could be considered 'well-placed artificial protection having a minimum rating of 5 kN' – i.e., Level 3.

So, to ask again, are the values obtained strong enough? I think they're sitting in that grey area where if you're already a convert then you'll happily look at these numbers and keep using them how we are, but if you're a nervous nelly then you'll easily point out numerous red flags you can dwell on. I think I'd summarise it with 'Hilti 6 x 65 mm concrete screws are strong but they're not bomb-proof so use them accordingly and with caution'.

Load cell digital display and Jemma's notes.

What repeatedly applying high loads to a M12 expansion bolt does when you don't really nip up the nut. We used this single 12 mm bolt to hold the welded angle bracket in place; a single bolt so we could pivot the setup and place test bolts in multiple low radius arcs instead of an ever-lengthening linear arrangement.

Miscellaneous Comments

Impact Drivers

Installing concrete screws by hand is tedious. Impact drivers make it much more pleasant. We were happy to see that all six screws installed with the impact driver exceeded 15 kN. The driver used was a 12 V Milwaukee used on setting 2 (setting 1 often didn't have the oomph to drive the screw). There is a setting 3 and 4 (drilling) and there are various brands and settings and voltages available, so it would be foolhardy to categorically state that using an impact driver to install 6 mm concrete screws doesn't weaken them significantly, but it is probably reasonable to state that using an impact driver is ok so long as you start on the lowest setting and only step it up when/if needed, and be sure to back the screws out two or three times during installation as it is impossible to hear the tell-tale squealing noise of a bound screw about to be over-torqued above the rattle of the impact driver.

Edge Placement

It was a small sample size, but 50 mm worked fine (17.1 kN) and 20 mm resulted in some rock spalling and a lower than average breaking strength (11.7 kN). Siegenthaler & Hof (2019) quote Hilti's minimum edge placement distance as 35 mm. I don't think any self-respecting caver would place a bolt closer than ~60 mm from an edge, so we should be all good on this front.

Sticking Out

Screws sometimes unwind themselves a bit and other times people install them incompletely in the first place (but poor installation is not limited to concrete screws – we've all seen shithouse spit and expansion bolt installations over the years). Also, a concrete screw that has worn or broken threads (from multiple installs) in a hole that's been re-used multiple time can be quite loose in the hole and prone to unscrewing, particularly if it's a single bolt at a rebelay where passing cavers pull sideways on the rope in a way that rotates the hanger in a counter-clockwise direction (doubling such an anchor tends to solve the problem).

Testing (only two) showed reduced strength values (10.8 and 11.8 kN). Not catastrophic numbers but if paying attention can get you an extra 5+ kN then I'm all for it.

Janky Hanger

I was surprised the crusty old alloy hanger that I found rotting in a cave for an indeterminant length of time proved stronger than the concrete screw (13.9 kN). Regardless, I won't be putting it back in service.

Reamed

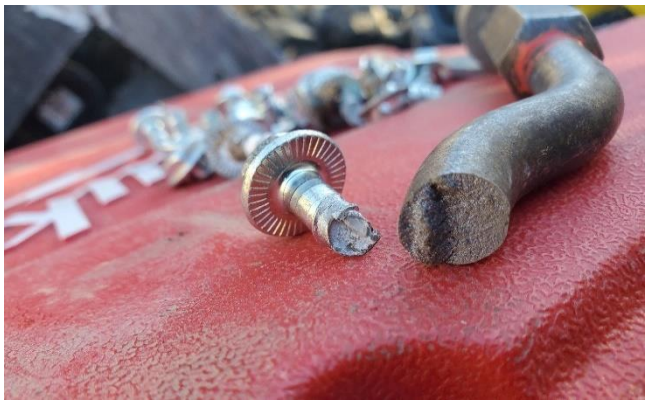
This was an attempt at making an oversized hole. The same 6 mm drill bit was used but the hole was worked hard, angling the drill bit etc. I wouldn't read much into this result, but it is worth noting that Siegenthaler & Hof (2019) drilled oversized holes for some of their tests and determined that it made no difference in shear. It could obviously be bad in tension!

We used a good quality Hilti drill bit ('quad tip') for all the holes. Anecdotally we've noticed that the cheaper two-tipped drill bits often drill a tighter hole, and they also tend to wear out faster than a four tip bit. Screws can be very hard to install into an undersized hole and it increases the risk of over-torquing them (potentially snapping them off or weakening them). Use a quality drill bit in near new condition to make your installations easier and arguably safer. Even consider a 6.5 mm drill bit in really hard rock (like Tasmanian Pre-Cambrian dolomite).

Wonky

This is a common problem among new bolters. For this test we had all the bolts leaning towards the load, this would put the screw partially in tension as well as in shear. It is rumoured by sketchy ice climbers that this might actually be a stronger orientation in some circumstances, so maybe it would be worthwhile testing other loading directions on wonky screws before drawing a conclusion on this one. And of course, there are 90 degrees of wonk so what we played with here is hardly a comprehensive assessment of 'wonk' on screw strength.

Lots of broken screw heads and the historic 'jank hanger' with the manufacturer's bend taken out of it.



Even 12 mm of high tensile steel fails after decades of high forces flexing it. After a few tests the 12 mm open hook on the tester failed instead of a 6 mm screw. This hook has been used to test hundreds of glue-in eyebolts in caves and on rock climbs over a 20-year period. It has now been replaced with a more robust clevis style.

Further Testing

The data set is pretty small and doing more would be valuable.

We haven't tested any screws that have been installed into a new hole multiple times and re-use is a common practice to date.

Galvanised versus Stainless Steel – Siegenthaler & Hoff (2019) compared gal with SS (inox) and found the SS to be significantly stronger. We've never mucked around with the SS screws here, principally because they're ~5x the price and as far as I'm aware, Hilti don't make them under 8 mm diameter. It would be interesting to get a hold of a box of the German Multi-Monti ones and do some testing. If we can consistently get ~20 kN out of a small-diameter stainless screw then it effectively puts to bed all concerns.

Acknowledgements:

Thanks be to:

Stephen Fordyce for his technical and electrical expertise re the load cell.

Jemma Herbert for reliably providing the activation energy to get almost anything done and for being a numbers and stats nerd.

Henry Garrett for youthful enthusiasm and assistance breaking stuff.

PWS for trusting us with thousands of dollars' worth of shiny load testing kit.

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Cave bones – a primer for cavers

Rolan Eberhard

Much of what we know about the deep time history of Australia's fauna, including the evolutionary linkages between species, early interactions with humans, and the timing and causes of extinction, depends on evidence found in caves, especially fossil bones. Cavers have played a key role in finding, reporting, and researching these fossils.

In the 1970s, TCC's Albert Goede and Peter Murray from the Tasmanian Museum and Art Gallery studied bone deposits in caves in the Florentine Valley and near Smithton. They found evidence of prehistoric human occupation in a cave which also contained megafauna fossils, leading them to suggest that early humans had co-existed with giant kangaroos. Although not widely accepted at the time, the possibility that megafauna was still present in the landscape when humans first entered Tasmania about 40,000 years ago has gained currency following further cave-based research. The evidence for this includes fossils of giant macropods found by the SRCC at Mt Cripps. More recently, notable fossil finds have been made by Alan Jackson and other STC members at Femur Fest, Bill and Callum Nicholson and Phil Jackson at Predator Pot, and Stephen Jacobs and others from NC and MCCC at Caveside. These caves are providing new insights into Tasmania's past during a period of profound change which strongly conditioned the present-day landscape and fauna.

This article has two main purposes. Firstly, it seeks to increase awareness amongst cavers of fossil bones as an invaluable scientific resource, the care of which should be routine minimal impact caving practice.

Secondly, it provides tips on how to recognise significant bones, as opposed to the everyday recent bones present in very many caves. Cavers who wish to record and report fossil bones are encouraged to do so – I am more than happy to provide feedback and to visit caves with potentially significant bones. I'm not a palaeontologist but am involved in relevant collaborative research with museums and universities.

Sources of cave bones

Pitfalls

It is self-evident that caves with steeply inclined entrances are natural pitfalls with potential to entrap animals. If the form of the entrance is a vertical shaft with a cone of sediment at the base, then likely there will be animal bones buried in the sediment and probably also scattered on its surface. Animals entrapped in pitfalls do not always die because of the fall; rather, they tend to die later of the effects of injury, exposure, dehydration and/or starvation. Some of the animals which survive the initial entrapment event will stay in the vicinity of the cave entrance and ultimately die there, typically after placing themselves in a niche or other semi-protected place against the cave wall. Other animals may move deeper underground before they perish – quolls and ringtail possums show this tendency. Thus, although the highest concentration of bones is often found close to the entrance pitfall, bones may also be found deep underground in unexpected places (Figure 1). Articulated skeletons are less common than disordered clusters of bones, due to disturbance from later entrapped animals or natural flows of water or sediment (Figure 2).

Animal dens

Certain caves are frequented by carnivores such as Tasmanian devils. These tend to be smaller, horizontal caves which provide both shelter from the elements and opportunities for defense against competitors. Devils are bone crunchers par excellence and the remains of their prey tend to be reduced to small angular shards of bone. This is not ideal for some purposes, because shards of bone are hard to identify. Even so, bone deposits of this type are still of interest for what they can tell us about the presence of devils in the landscape over potentially long periods of time.

In addition to devils, other Tasmanian animals which opportunistically inhabit caves include wombats, brushtail possums, rats and platypus. Some of these animals will die from disease, injury or old age in the caves which they habitually occupy.

Owl roosts

Owls swallow their prey whole and later regurgitate undigested fur and bone. They also roost in caves, amongst other places. Consequently, caves used by owls may contain dense accumulations of the bones of their prey, typically dominated by small mammals such as rats, pygmy-possums, antechinuses and bats. These deposits are of high scientific interest – a recent study used owl roost deposits to track changes in the abundance and diversity of small mammals in Tasmania during the last 20,000 years.

Other sources

Most of the bones encountered in Tasmanian caves will be derived from one of the sources described above, especially pitfalls. In addition to these, at some sites other sources may need to be considered. These include prehistoric human occupation or the intentional disposal of animal carcasses in caves. Bone deposits from these sources may be easy to recognize, because the cave is an obvious place for people to shelter, or because it is located close to farmland and contains agricultural rubbish.

Bats are a further special case. Tasmanian bats do not now roost in caves; however, bat skeletons are not especially rare in our caves and in a few caves occur as clusters which suggest roosting behavior. Where the skeletons of individual bats are found, this may be due to animals entering caves and becoming lost, dying before finding their way back to the surface (Figure 3).

Field identification and photography

Tasmania's mammal fauna is not very diverse, which is helpful when identifying our cave bones. Of course, skulls are easier to identify than post-cranial bones, although it is sometimes still possible to identify the latter. The level of confidence of an identification made in the field will depend on the experience of the observer, the completeness or otherwise of the bone/skeleton, whether the bone is clean or coated in sediment, and the species or group in question – some species have very distinctive bone structures which cannot be confused with any other species; others are separated from other species by subtle differences which cannot be resolved in the field. Skulls of the more common species can be recognised by their size, shape, and dentition. The book *Skulls of the Mammals in Tasmania* by R.H. Green (revised 2015) is an excellent starting point for anyone interested. It is not essential to attempt an identification in the field, but it may add interest to try, and in doing so you are more likely to notice details which will later help to confirm the identification.

Photographs of bones are invaluable, both in terms of identifying the species present and evaluating their potential antiquity. In the case of articulated skeletons or cluster of bones, a series of images starting wide and then zooming in close to elements such as skulls is ideal. When photographing skulls, where possible take images from directly above and side on (see Figure 4). This will not be possible if the skull is partly buried in sediment, in which case it is best left undisturbed (see Minimal impact caving protocol below). Close up images of the teeth are especially helpful. Always include a scale of some sort, which can be any object which provides a familiar visual reference for size e.g., glove, watch, carabiner, etc.

Indicators of potential significance

Bones which are ancient, or otherwise of high scientific interest, may not be immediately recognized as such by a casual observer. Moreover, in some situations, bones which are only a few hundred years old will be of high interest, if the species is rare or extinct for example. Thus, it is prudent to treat all bones as potentially significant. The following indicators can help assess the possible significance of fossil bones in the field:

- unusually dense accumulations of bones;
- bones which are larger or otherwise different compared to modern species;
- bones which look weathered, ancient or otherwise fossilized;

- bones formerly buried in sediment and now exposed by erosion.

The conditions described above are illustrated in a selection of images below (Figures 5-9).

Minimal impact caving protocol for bones

The ASF Minimal Impact Caving Code states:

> If bone material is found, the bones and surrounding area should not be disturbed, but should be taped off pending consultation with the landowner or land manager (management authority) and scientific specialist (e.g., palaeontologist or archaeologist). Do not remove such material without permission.

The three actions implied by this prescription – avoid disturbing the bones, mark them off so others do not inadvertently disturb them, report the find – will be straightforward in most cases. The marking off can be done using flagging tape, string, or a line of rocks (Figure 10). However, situations may arise where it is advisable to move bones to make them safe, as in the case of bones in constricted passages subject to ongoing visitation. Placing these bones out of harm's way at the side of the passage is probably better than leaving them in situ and exposed to a high risk of being crushed underfoot by cavers. This should only be done as a last resort following consideration of all available options, including that of closing the passage. It is also acceptable to move bones for authorised research, noting that all natural features on reserved land including bones are protected by law and cannot be taken without an authority.

Figure 1; Articulated skeleton in Dwarrowdelf. These bones are more than 200 m below the cave entrance near the base of a 67 m deep shaft. The animal survived the fall and moved some distance away from the fall line.

Figure 2: A disordered accumulation of wombat and wallaby bones in a cave at Cave Hill. These bones are probably in the order of hundreds or thousands of years old.

Figure 3: Bat skeleton with fingers for scale in Exit Cave. The presence of fur and skin suggest that this specimen is not especially old; however, under ideal conditions, the soft tissues of dead animals can be preserved in caves for millennia.

Figure 4: Ideal views for identification of a cranium, in this case potoroo. Although it is not possible to make images like this in the field, it is included here as a model for framing images of in situ skulls, to the extent that actual conditions in the cave may allow.

Figure 5: Femur of an extinct giant kangaroo in a cave at Cave Hill. The bone was found by STC cavers who immediately recognised it as a significant fossil due to the exceptional size. A systematic investigation of the site is now underway.

Figure 6: Bank of bone-rich sediment in Femur Fest Cave. Much of the original sediment has been eroded away, exposing numerous, formerly-buried bones. In this example, despite being coated in sediment, the bones are obvious because they are large and very numerous.

Figure 7: Bones of wombat and giant kangaroo cemented on the underside of a suspended sheet of flowstone in Dromaius Cave. The original floor on which the bones were deposited has been eroded away.

Figure 8: Macropod bones embedded in flowstone in Boomer Cave. The density of bones demonstrates the efficiency of the cave as a pitfall trap, implying potential for more ancient bones buried in sediment on the floor.

Figure 9: Skull of a ringtailed possum in the aptly named Pseudocheirus Cave. Bones can become coated in flowstone over periods of decades to centuries, creating curious mineralised shapes which are novel but not necessarily scientifically important.

Figure 10: Echidna skeleton marked off with flagging tape in Chief Inspector Cave.

Letter to the editor

(This letter corrects an earlier piece in SS *354, p3.- Ed.)*

Sassafras Block access, Mole Creek Karst National Park (MCKNP).

Chris McMonagle
Karst Ranger
Great Western Tiers

South Mole Creek Rd provides public access to the Sassafras Block of the MCKNP and was gazetted as a reserved road when Springwater Farm was split up and part of it became MCKNP in the early 2000's. It was specifically gazetted to ensure public access through the remaining Springwater freehold title to the reserve was maintained into the future. This block contains popular and regularly visited caves such as Baldocks and Sassafras caves, (which are utilised by caving clubs and community organisations such as schools, Scouts Tas and a commercial tour operator) so maintaining public access is an important aspect of managing that particular area.

The fact that there is a locked gate at the start of this access road is not bound by any legislation as such, but rather is a result of a 'gentleman's agreement' instigated by previous owners of the Springwater freehold title, who wanted to reduce public access that could lead to illegal activities such as stock theft, wood hooking, deer hunting, etc. The restriction of general public access works well for both Parks & Wildlife Service (PWS) and the private landowner by significantly reducing unmanaged general public access and its associated issues.

When the block sold last year, the new landowner replaced all the existing locks with their own, under legal advice that the road was part of their private tenure. We contacted them to try and inform them of the legal right of access and to reinstate the PWS combination lock, to which they argued against, claiming their solicitors indicated otherwise. Because the road is not PWS tenure we had no authority to issue a formal direction to reinstate our lock, so then had to contact Crown Lands and request they provide the new owner with the correct legal information and formally direct them to remove their locks because of that pre-existing legal right of way for public access.

The new owners then worked with us to reinstate the pre-existing security arrangement. However, they are not supportive of public access on their freehold title and as such have requested that no one access their land for any purpose - even if it is just walking along the fence line to get to Sassafras cave. Hence, we have had to modify the gate system near the big tree and revise the Sassafras Block Access Protocols (that I have emailed to all of the caving clubs in the past few weeks).

So, in sum, that road is a gazetted Reserved Road for public access and as such the new owner of Springwater Farm has no rights to restrict or direct anyone who is using it to gain access to the reserve. They are not permitted to run stock on the road (as they were when they initially bought the property) nor direct or control any public activities related to the use of that road.

I hope this clarifies the situation, please contact me if any further information is required or if there are any issues with caver access to the reserved road at any time. If you are considering publishing any future articles regarding tenure access to PWS managed reserve estate, or any matters pertaining to decisions made by PWS that affect karst management or public access, I am more than happy to review the content prior to publishing to ensure the correct info is presented.

The JF-210/211 Sesame Story

Stephen Fordyce.

Photos by Stephen Fordyce unless credited otherwise.

Party: Karina Anders, Lachlan Bailey, Nina Birss, Lewis Clarey, Matt Dunwoodie, Stephen Fordyce, Jemma Herbert, Gabriel Kinzler, Alan Jackson, Anna Jackson, Simone Lee, Hugh Mason, Brendan Moore, Michael "Pax" Packer, Oxana Repina, Ciara Smart, Adriana Stoddart, Austin Zerk

While many of the adventures in Sesame Cave over the past few years have been covered in various levels of detail, I've long promised (threatened?) a report to fill in the gaps - here it is.

History and Description of JF-210/JF-211 Sesame Cave and JF-633 Ring Hole

These first few paragraphs are largely plagiarized from the.htm file in the archive folder (it has references too). The cave was explored in 1972 from the higher JF-211 Sesame II entrance, which has a pot entrance with 4 shortish consecutive pitches (total ~40 m) that lead to a horizontal section. This horizontal section was linked via some tight crawls and rockpile climbs to the JF-210 Sesame I entrance in rockfall in the bottom of a large doline nearby in 1980.

There is a Sesame Street naming theme, with assorted favourite characters featured. From the junction point, the cave continues horizontally in small but not horribly tight passage until it drops 55 m across 2 pitches. A spacious rift passage with intermittent stream is followed sometimes above, sometimes below an interesting calcite false floor, until eventually there are another 2 short pitches. The rift continues until the floor drops out and the ~20 m drop was the end of the cave at that time. A moderately entertaining, mostly dry cave.

Exploration beyond this point in the early 1980s, and subsequently in the mid-1990s is detailed by Rolan Eberhard in *SC*59, p11. Vera Wong apparently gets the credit for pushing through The Wet Hole, and anyone who's been through is in awe of her effort.

From the top of the 20 m drop, a rather exciting traverse across (and another shortly after) leads to a considerable amount of more solid-floored rift passage which widens to 2-3 m in places. When the mud hits 11 out of 10, it's obvious the cave has hit base level, and the passage slimes its way into a dolerite-filled choke. However, just back from this point, there's a spacious but slippery climb heading up into some surprisingly big rooms and rockpile – it took more than a decade before this was pushed in 1994. Actually, it's a series of slippery climbs, with handlines now left in situ (it

was so improbable, that it took the next party in ~2015 3 trips to identify and get up it).

From the large, high levels up there, the Irish Expedition of 2018/19 (See *SC*71) in conjunction with Andreas Klocker, found some good leads going off away from the main cave and to draughting rockpile. Andreas and Petr Smejkal did a couple of capping trips but it didn't really do anything. Alan took the survey to the start of The Wet Hole. But I digress…

The 90s crew found a slippery slope back down to base level, and a healthy little stream where there was no stream before! The upstream direction was later found to be from JF-633 Ring Hole (although via an impassable dolerite choke), while the downstream direction went into a horrid little grovel in the water. At some point a name paying tribute to Vera's effort to get through was applied but has been superseded by "The Wet Hole". It's bloody awful, a 60 m belly-wriggle, the crux of which is a 25 cm high section half full of water. Anyone saying it's not that bad will be sent back to do it with 2 bags of dive gear, as per the video (3 minutes) in the archive and also here: https://youtu.be/tlqYhmZWfNE

There's another stupid climb (3 m) just before the stream disappears into cobbles again, and another higher level of expansive rockpile, mud and horror. A few improbable and disorienting squeezes get you to a slimy tight 13 m pitch, which dumps you unceremoniously back at base level yet again. Then the cave presents The Little Wet Hole, which is tighter but shorter and a bit less wet than the other one. How the 90s crew had any motivation to continue pushing is almost beyond my comprehension. Respect. It was apparently so miserable that these otherwise data-conscious cavers didn't survey anything beyond the 1980 extent. This was rectified in 2021 with the help of fellow mainlanders Lewis, Matt and Hugh (who carried dive gear and re-found the route to the sump on their first Tassie caving trip!).

After The Little Wet Hole, finally there is some return on the investment of effort to get to this point. A short section of pleasant crawling passage intersects a much larger streamway (shown by 2022 dye tracing to come from JF-364 Tarn Creek Swallet), with generously proportioned walking passage – the Streamway of Joy. Definitely sub-master cave as far as I'm concerned. There is a couple of hundred metres of positively joyful going (some climbs, minor squeezes, and mud, but nothing compared to getting there) smaller streams joining every which way, and a large inflow stream which is the combined water from JF-201 Tyenna Tomo and JF-202 Rescue Pot (dye traced in 2021). Finally, the joy ends with what has become an excitingly major stream going into a sump.

The lack of good leads entering the Streamway of Joy is disappointing and even with the best part of a day for Brendan and I to check, we found nothing (even in my diving wetsuit I, could only get a few meters into the 2 major inflowing streams before they got way too low).

The 90s crew presumably had less miserable things to do (the heyday of JF cave exploration was in full swing), so left the sump alone, and it was a project spearheaded by Andreas Klocker which next visited The Wet Hole some 30 years later (in 2015). A party of 3 eventually got to the sump in 2016 (*SS*413, p13) and were suitably impressed, although managed only a few survey shots on the way out before admitting defeat in a similar spirit as the previous visitors.

Meanwhile, through 2015 (my first year on the Tassie caving scene), JF-633 Ring Hole was explored (my first first descent!) and extended over the course of many exciting trips driven by the enthusiasm of Andreas and others, getting ever closer to Sesame. Finally, Ring Hole was connected to Sesame in 2016 (*SS*413, p11) via another tight/muddy passage unfortunately dubbed "The Perineum" and the combined system now had 3 entrances and a respectable amount of cave passage, although it's unlikely to become a JF classic. At time of writing, there is 3114 m included length and 240 m depth.

This was about the same time that exciting things and dives were happening in the likes of Niggly and Porcupine, so the Sesame dive fell down the list. Sesame was rigged for the Irish Expedition of 2018/19 so that Andreas could dive the sump, but the weather was not kind, so they never made it through The Wet Hole.

By January 2021, the sump still hadn't been dived, and I was red-hot keen after 10 months of COVID lockdown in Melbourne. Few of the 14 people involved went in the cave more than once (but put in some amazing effort when they did), but the dive was done, as was the 35 years overdue survey to the end (and the first dye tracing in the cave). The dive was a scary 40 m of feeling my way through chocolate milk, thanks to the muddy water that our approach to the sump created - this was impossible to avoid, but quite unsatisfying. With the benefit of the 500 m of new survey data (from The Wet Hole onwards) showing the cave going unexpectedly close to Niggly, and 6 months to forget the worst of the horror, an even more ambitious project was planned for January 2022.

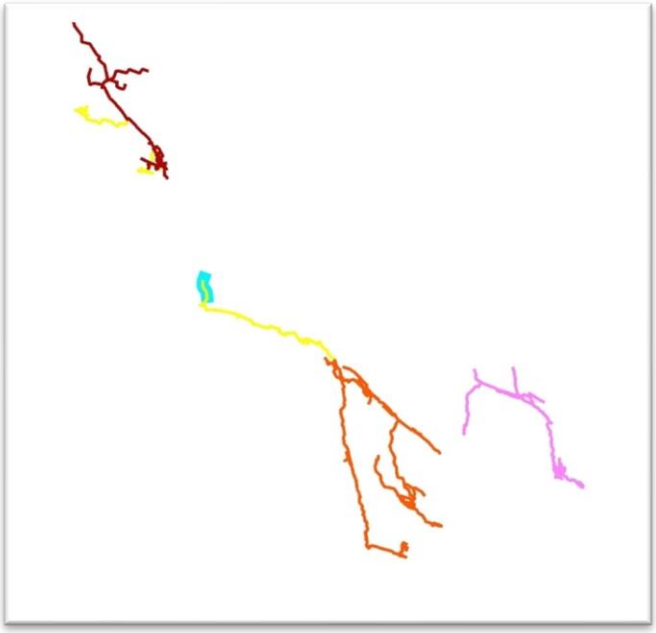
In addition to assorted setup and cleanup trips, Brendan Moore and Ciara Smart joined me for the 3-day, 2-night underground dive trip which stretched us all to the limit. Ciara got hypothermia and needed a rest day, Brendan pooped out his mojo, and I was ready to retire from caving and have babies. However, we got 7 bags through The Wet Hole and to Camp Squelch near the sump after midnight on day 1, and the premise of the whole awful camping exercise (letting the water clear overnight) was good.

Nobody was allowed near the water in case it was muddied, and I gingerly flopped in and swam ahead of the flow. The water was clear and I could see! This made it HEAPS quicker and easier to reach the end of the previous guideline and find a way on. Unfortunately, shortly afterwards the passage narrowed to a horizontal slot about 10 cm high, with a cemented gravel floor I had no tools to dig through. To be honest, it was pretty desperate and I was at the limits of my motivation anyway by this point. I was so shagged and over it that as soon as the dive was done, I emptied the tanks, so I wasn't tempted to try again.

Brendan and I spent the afternoon thoroughly lead checking the Streamway of Joy and wrote it off in pretty good conscience. We also left dye detectors which were collected a few months later by the de-rig team, and which yielded a whole lot of puzzling negative results.

The return on the 2021-22 Sesame investment is to be frank, feckin shite. But the prize (5 km of master cave between Niggly and Junee) still haunts my dreams, and I'm proud of all the amazing people who helped get Sesame to this point. They might not be born yet, but I hope to hear about some future amazing people writing another chapter in the history

of Sesame. It's a turd a of a cave, but one hell of a respectable turd. It'd give that giant fossilized Viking turd a run for its money I reckon.



Plot of Sesame/Ring Hole (orange to 2015, yellow 2021-22, blue is the sump) and nearby caves (Niggly top left in maroon, Voltera bottom right in pink)

Karina illustrates layering technique (photo by Gabriel Kinzler)

Brendan, homeward bound in The Wet Hole with 2 bags in tow

Lachlan admires some nice bits of Sesame

(photo by Gabriel Kinzler)

Ciara at the crux of The Wet Hole

Summary of trips/reports*:*

I spent 10 days and 2 nights in Sesame, which I'm pretty certain is enough for one lifetime. In total, 18 people contributed 36 person-days to bring home the survey data and make the two short dives happen. All trips were reported on, although some quite briefly, a summary is below.

Date	Reference	Party	Summary
2020-12-20	*SS*442, p7	Alan, Anna & Gabriel	Rigging and making useful notes (added to the archive).
2021-01-07	*SS*442, p11	Nina & Oxana to The Wet Hole. Steve, Lewis, Matt, Hugh to the sump.	Route finding and dive gear portaging to the sump. Dye detector placement.
2021-01-09	*SS*442, p11	Steve, Pax	Dive #1, and dive gear portaging back to The Wet Hole. Dye detector retrieval.
2021-01-12	*SS*442, p13	Steve, Simone	Dive gear retrieval
2021-01-19	SS442, p15	Steve	Dive gear retrieval
2021-02-11	*SS*444, p21 Speleograffiti 27.1, p37	Hugh, Austin, Adriana	De-rig!
2021-11-13	*SS*447, p8	Ciara, Jemma	Rig higher entrance (JF-211) and 2 big pitches on main drag.
2022-01-02	SS449, p11	Steve	Portage 4 bags dive gear to entrance.
2022-01-03	*SS*450, p10	Steve, Brendan	Rig last 2 pitches, and portage some dive gear to The Wet Hole
2022-01-8 to 10	*SS*450, p11	Steve, Brendan, Ciara	Dive #2, lead checking, and 2 nights at Camp Squelch. Dye detector placement.
2022-01-17	*SS*450, p14	Steve, Lachlan	Dive gear retrieval
2022-04-30	*SS*450, p27	Steve, Lachlan, Gabriel, Karina	Dye detector retrieval, de-rig, kiss the cave goodbye.
-	*SS*451, p18	Steve	Amphipod report & specimens
-	*SS*442, p11 *SS*452, p26	Steve	Dye tracing results – JF-201 & JF-202 Dye tracing results – JF-364 & negative results

Diving Notes:

A video of the 2022 dive (10 min, 180MB) is in the archive, and will be available online until I remember to delete it at: https://youtu.be/zPPUwd7XzMw

It's a downstream sump, small enough and with sufficient current (in dry summer conditions) to carry silt ahead of a stationary diver in 5-10 seconds. Even with the dive gear already at the sump, and a careful approach by a party of 2 for the 2021 dive, the visibility was completely silted out before starting, but in 2022 it cleared perfectly overnight. The streamway leading to the sump pool is cemented large cobbles, so as long as dive gear is clean (ie. wash it on arrival, then leave overnight) it's ok to stand and lie in the stream. There's a convenient gear-up spot about 20 m back, with only moderate silting risk. I was too paranoid to allow anyone to leave camp and risk muddying the water until the dive was well and truly underway. With all that effort potentially being derailed by a single careless moment, paranoia was the order of the day.

The ceiling drops as the cobbles slope down into the sump pool proper, and it's necessary to wriggle (fully kitted) on cobbles the last couple of metres, really hard work. There's a mudbank on the left which is where the guideline should start – I think primary tie-off is a rock, and secondary is a siltpeg. The sump pool has a silty cobble slope going down at 30deg, so it's necessary to launch off the cobbles and race the silt which rolls and is carried down as soon as you disturb it. Don't forget to unlock the reel, spit in your mask, open tank valves, acclimatize face to avoid an icecream headache, etc.

The initial slope leads steadily down a low silt-floored passage with roof steps making for tighter restrictions until levelling off in slightly larger cave at 5 m depth. It then slopes similarly up again (with a few squeezes off to the sides which were visually checked and written off) and meanders along in very shallow water until a miserable little airbell can be reached. There is about 6 cm of airspace and 30 cm of water so even with a decent width, it wasn't particularly useful for breathing, although it was a great relief to be able to check my gauges (via a gymnastic routine to get the gauge and at least 1 eye out of the water and in line simultaneously). Ahead through very low half-submerged passage, it transitions to narrow with a bit more airspace (slight chance of a rift). Looks maybe passable with great difficulty, sounded like it sumped again. That's where I ran out of mojo and called it quits on the 2021 dive, tying off on a silt peg and cutting the line, and managing a vaguely credible survey on the way out (about 40 m of dive passage). In 2022 our yellow commemorative marker was left there too.

Fortunately, in 2022 with good visibility, by sticking to the right wall of the airbell it was possible to skirt around in low underwater passage, and the airbell is probably just part of an L-shaped profile (but it would be worth checking better – a review of the video indicates a slight chance the rift might continue on separately to the underwater passage). This is very shallow small passage (80 cm wide x 30 cm high), with well-defined rectangular shape and higher current, and it goes for an estimated 10-15 m past the airbell. At this point there is a right-left zigzag but it's too low to get through (about 15 cm). The floor is cemented gravel, I had a half-hearted go but really needed tools and time. There was a mudbank on the left of the restriction which I dug a bit, but it didn't seem very useful.

In the first dive (2021), the entire dive was blind, and I followed the left wall through a series of very tight restrictions and potential line traps which was very slow and stressful considering the way back (I also couldn't read my pressure gauges). It took what seemed like forever to reach the airbell and reset (kind of). But on the way back, the line had pulled into the middle of the passage and it was MUCH easier. As in, I only needed 10% of the inwards time and gas to get out. I was away for 37 minutes, and the return took 4 minutes. I used 50 L of gas compared with 600 L.

In 2022, I had good (2-3 m) visibility all the way in, and surprisingly, mostly on the way out. The silt must have travelled at the same speed as I did. I ran a new line to avoid having been delayed fixing, digging out or tying onto the old one, and would recommend this – I reeled out and left the original (so the 10-15 m extension is currently un-lined, and also unsurveyed, sorry. While it was quick (28 minutes, about 6 minutes on the way out), I was able to do a thorough visual inspection (and GoPro record) and be pretty confident there were no other leads. Also, that it was a pretty tight and nasty sump even with visibility, with at least 5 places requiring head-on-one-side wriggling through restrictions. The original 2021 guideline was left in place.

The end of the dive would be a viable dig for a suitably insane cave diver. However, if a diver and support crew have the stomach for it, a 4+ day camping exercise could allow a familiarization and digging day to ideally get through into going passage, then a push dive the following day with clear water. Extra days could be allowed for, or the dive gear left in the cave for subsequent trips in the event the first digging dive isn't enough. Remember to check the airbell again for leads per a couple of paragraphs ago.

Well, that's almost tempting. But not quite – at least for the moment there are much preferable things to be done in the hunt for the master cave.

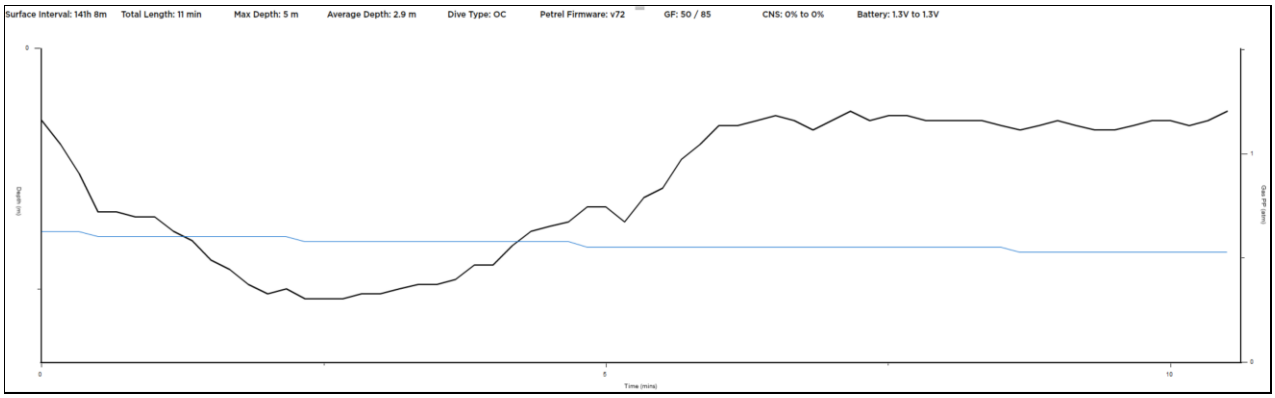
Misc notes and suggestions:

- Max depth 5 m, and average depth more like 2 m.
- There is a pile of threadable dive weights left at the start of The Wet Hole (look upstream when reaching the stream). Estimated 6x 1.2 kg, probably more. I didn't use them.
- Things to do at the sump the night before the dive:
    - Wash any dive gear and bags from the transit in.
    - Consider setting up and laying out gear to avoid unnecessary movement.
    - Check the guideline and/or set up your own tie-offs, leave the reel where it can be grabbed on the way past. Risk of silting if done in the morning.

Dive Gear Used:

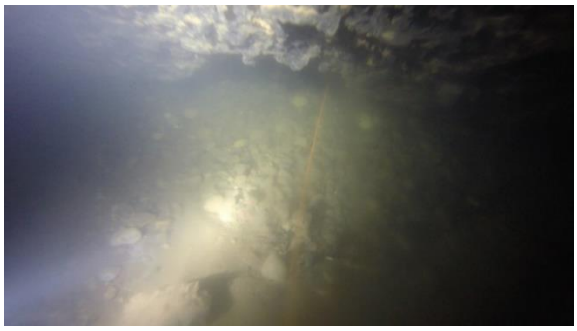
- 7mm semi-dry wetsuit (highly recommended over drysuit)
- Drybag for wetsuit (highly recommended to reduce trapped water and weight)
- No weightbelt

- Wing & fins (suggest omit these next time)
- 2x 5L steel tanks @ 245bar of Nitrox32 (2021 dive)
    - 600L used to air bell
    - ~150L used tying off in air bell
    - 50L used on return(!!)
- 2x 7L steel tanks @ 255bar of Nitrox32 (2022 dive, too large!)
    - Gas use was so little and mojo so low that I didn't record it
- 3mm orange floating guideline and yellow silt pegs (highly recommend running a new/independent line to avoid the chance of losing the clear water while stopping to fix a break)
- Recommended: a tarp or garbage bag for laying clean dive gear on
- Recommended: a small crowbar or tool for digging cemented gravel



Dive profile (2021 dive, going in to air bell)

The Sesame Sump



The Sesame sump

Camping Notes*:*

Two nights in January 2022 were spent at the aptly named Camp Squelch, which was selected as the closest viable campsite to the sump. As you approach the sump, there is a major stream joining from the left (Rescue Pot & Tyenna Tomo) and the route goes up and away from the water through a mud crawl. The crawl opens into mud-floored walking passage shortly before (briefly) rejoining the stream - if you get to a small stream joining on the left as the main stream hooks to the right, you've gone too far. Getting from camp to the sump without muddying the water is reasonably straightforward, although requires a muddy crawl, some rock hopping and tiptoeing on cobbles – ie. not doable in camp attire, and there is still risk that a careless step will muddy the water.

Despite the relative softness of the mud, Camp Squelch is actually not the worst cave campsite I've slept at (that dubious honour goes to Camp Fireball, in Elk River Cave, Victoria). It's only about 0.5 m above the stream, which is 8 m away, so water collection and peeing is convenient, if somewhat lacking in privacy. Pooping was done at the stream as well (all solid waste was carried out of course). The mud is much squelchier than the firm packed stuff of Niggly camps, with camp shoes being just worth doing but getting very muddy (gumboots were wet from the trip in). Fortunately, no actual liquid, so we didn't wake up in puddles or anything ghastly like that. It had been a pretty dry year and there weren't indications of recent flooding, so this level of dampness is probably best-case scenario.

The ceiling is only 2-3 m away and the camping sites are in line along a muddy trough, so walking past to access the stream is tricky. A groundsheet/tarp big enough to sleep on and to fold over while people walk past (and for drips) was useful. It was a bit annoying having to bring all the stuff which normally stays in Niggly, I think a bit of the camping gear overflowed our 1 camping bag each into the 4 dive gear bags. The bag to people ratio was… woefully inadequate and/or the setup trips insufficient – more detail about that in SS450, p11.

Weather and Flood Risk:

The Irish baulked at The Wet Hole after a bit of rain, and we were also very cautious about the possibility of flooding, with the dives planned for summer. The glutinous mud which liberally coats everything beyond P5 indicates some mega floods do happen, but perhaps (like the Horrible Crawl in JF-387 Porcupine Pot) there is some tolerance for moderate rainfall. There is for the most part a steady flow along cobbles.

- 2021 visits were in dry conditions
- 2022-01-08 (day 1 of 3) was right on the back of 16 mm of rain at Tim Shea, and while we noticed the crux pool being deeper, The Wet Hole was still passable, and the difference in the rest of the cave wasn't obvious
- 2022-01-10 (day 3 of 3) The Wet Hole was back to "normal", and we spilled some dye on a rock at the far end, about 5 cm above stream level.
- By 2022-04-30 on the derig trip, the dye was still there and water levels were "normal", despite 20 mm of rain at Tim Shea that morning.
- However it was a very dry summer and autumn

We elected not to wear wetsuits, but did wear extra layers. This mostly worked well, as the time to change would have been a killer, and wearing a wetsuit would have been too hot for the strenuous caving either side of The Wet Hole. A key exception being when Brendan, Ciara and I went through and messed about with rigging for too long, getting nastily cold.

The crux of The Wet Hole requires dipping of your cheek and one ear in the water when it's up a bit

Prospects:

- Another crack at the dive! A suggestion is at the end of the Diving Notes section
- The lack of leads (and the tightness of the 2 major inflow streams) in the Streamway of Joy were supremely disappointing. We checked thoroughly, but a second set of eyes wouldn't hurt.
- The high-level breakdown section between The Wet Hole and The Little Wet Hole could do with a thorough check, especially in the south and east directions. Might get you into the stream from JF-364 Tarn Creek Swallet.
- The high-level rockpile section between the handlines and The Wet Hole – it's big and confusing, we didn't look at it beyond traversing through. The Irish bit with good draught was revisited and modern digging techniques were applied by Andreas & Petr, but it was more of the same uninspiring muddy rockpile. Still, it looks like the best option for getting to the JF-364 Tarn Creek Swallet water.
- Stuff up near the entrance(s), i.e.. question marks on 1982 TCC map in the vicinity of Sesame Ave. I vaguely recall going there on a Sunday in 2015 and it went considerably further than the map showed, and there was some ancient VSA graffiti.

You will need to be THIS heroic to contemplate revisiting the dive

You will need to be THIS optimistic to contemplate revisiting the dive

The horrible slot leading to the last pitch

Rigging Notes:

- General Comments and shorthand:
  - CS: Hilti Concrete Screw (Gal), 6 x 65
  - TB: 8 mm Stainless Steel throughbolt (Raumer or similar), **with hangers left in place**
  - All holes marked with reflective parsnips unless noted otherwise
- P0 (JF-211 entrance pitches) – 80 m rope used for whole thing (inc. access line) with ~5 m spare
  - Access line starts tied off to tree
  - 2x CS Y-hang (may be moss-covered), down 11 m
  - 2x CS Y-hang, down 8 m
  - 1x 3 m sling rebelay (corkscrew squeeze through boulders), down 9 m
  - 2x CS Y-hang (tight slot at pitch head), down 9 m
- P1 - Originally only rigged as a handline. 25 m rope (estimated).
  - Short access line initial anchor to a rock
  - 2x CS Y-hang rebelay (pitch head), wonky holes? Down ~5 m
  - 2x CS Y-hang rebelay (on obvious ledge), wonky holes?. Down ~8 m
  - 1x CS rebelay. ~4 m down. At bottom skirt around hole to next pitch.
- P2 – 40 m rope (estimated, seems like a bigger pitch than the 20 m on the map)
  - 2x CS Y-hang (no access line), wonky holes? Down ~20 m.
  - 1x CS rebelay, with backup with 5 m sling to rock spike. Rope has a tendency to get stuck under a rock and tension the rope going up from here. Down ~10 m.
- P3 ("Oscars") - ~13 m rope plus 2 m rope or sling for redirect
  - 2x CS Y-hang (holes a bit wonky), down 1m
  - 1x CS redirect (~2 m rope), down 9 m
- P4 ("The Counts") - ~25 m rope (long access line and big Y-hang)
  - 1x CS access (need to add a second!), ~5 m across
  - 2xCS Y-hang (high up on opposite sides), ~7 m down
- P5 ("Stemple", down into dead end rift) – 20 m rope (estimated, as we didn't drop it, excludes access line)
  - 2 holes marked with pink tape probably for concrete screws
  - Beware threads in remnants of false floor
- T1 (Longer traverse over P5) - wasn't rigged, but really should have a safety line. ~25 m rope and 6 concrete screws should do it.
- T2 (3-bolt traverse over hole in floor) – 8 m rope
  - 3x CS singles. The anchors on each end are not doubled but really should be.
- H1 (Bottom handline at 11/10 Mud) – ~12 m rope
  - Tied through a single rock anchor (thread).
  - **Left in place** (11 mm ex-STC D2), but floods may lift or cover it.
- H2 (Middle handline at 11/10 Mud) – ~15 m rope
  - Also used for dodgy SRT.
  - Tied around single rock bollard.
  - **Left in place** (red 11 mm)
- H3 (Top handline at 11/10 Mud) – ~8 m rope
  - Tied around single rock, add knots for grip
  - **Left in place** (random stuff of dubious quality)
- P6 (Upwards pitch just downstream of The Wet Hole) – ~8 m rope (3 m pitch)
  - 2x TB Y-hang, with SS maillons.
  - **Left in place** (11mm red stuff)
  - Can be bypassed via upward sloping squeeze through hole at knee-height, or a keen climber can get up with an assist.
- P7 (Pitch to Little Wet Hole) - ~20 m rope.
  - Thread/tie around fridge-sized rock, down ~2 m
  - 2x TB Y-hang at ledge/slot, down ~10 m

De-rigged Sesame rope (photo by Gabriel Kinzler)

Lachlan negotiates H1 and 11 out of 10 mud

Gabriel's pasta and de-rig effort were both excellent

Survey & Map:

The survey data is all accounted for and in a Compass file, although there's an error between the two Sesame entrances, for which rectification was half-heartedly tried and failed, so it's currently hung off the JF-633 location.

There are a number of different Sesame maps in the archive from across the ages, covering different bits of the cave. These include:

- 1982 TCC map showing both entrances but ending at Pitch 5 (most complete map)
- 2018 Irish Expedition map showing the section they pushed above The Wet Hole
- 1998 Jeff Butt map showing the bottom of P5
- 2022 worked up sketches of The Wet Hole and Beyond

So there's a section between the top of P5 and The Wet Hole which is unmapped, and The Wet Hole onwards is informal. However there are good quality scans of in-cave sketches (thanks Alan) and a narrated GoPro video as a backup option.

There's also the matter of JF-633 Ring Hole which is part of the Sesame system and almost as extensive. There are quite a few worked up sketches and a good collection of scans of in-cave sketches.

It would be great to get it all into a single Sesame/Ring Hole map, which would be quite a grand affair. I must admit the idea doesn't thrill me, but maybe I'll feel guilty enough to hack away at it eventually. At least the data is there, even if it's not very pretty.

Some route-finding notes are in the archive:

- *SC*71, p47 (Irish)
- One in the archive by Alan with some edits from me

Brendan kind of looks like he is surveying, but he actually just fell out of the horrible slot

Pax has a classic Sesame experience (everything is blurry and covered in mud)

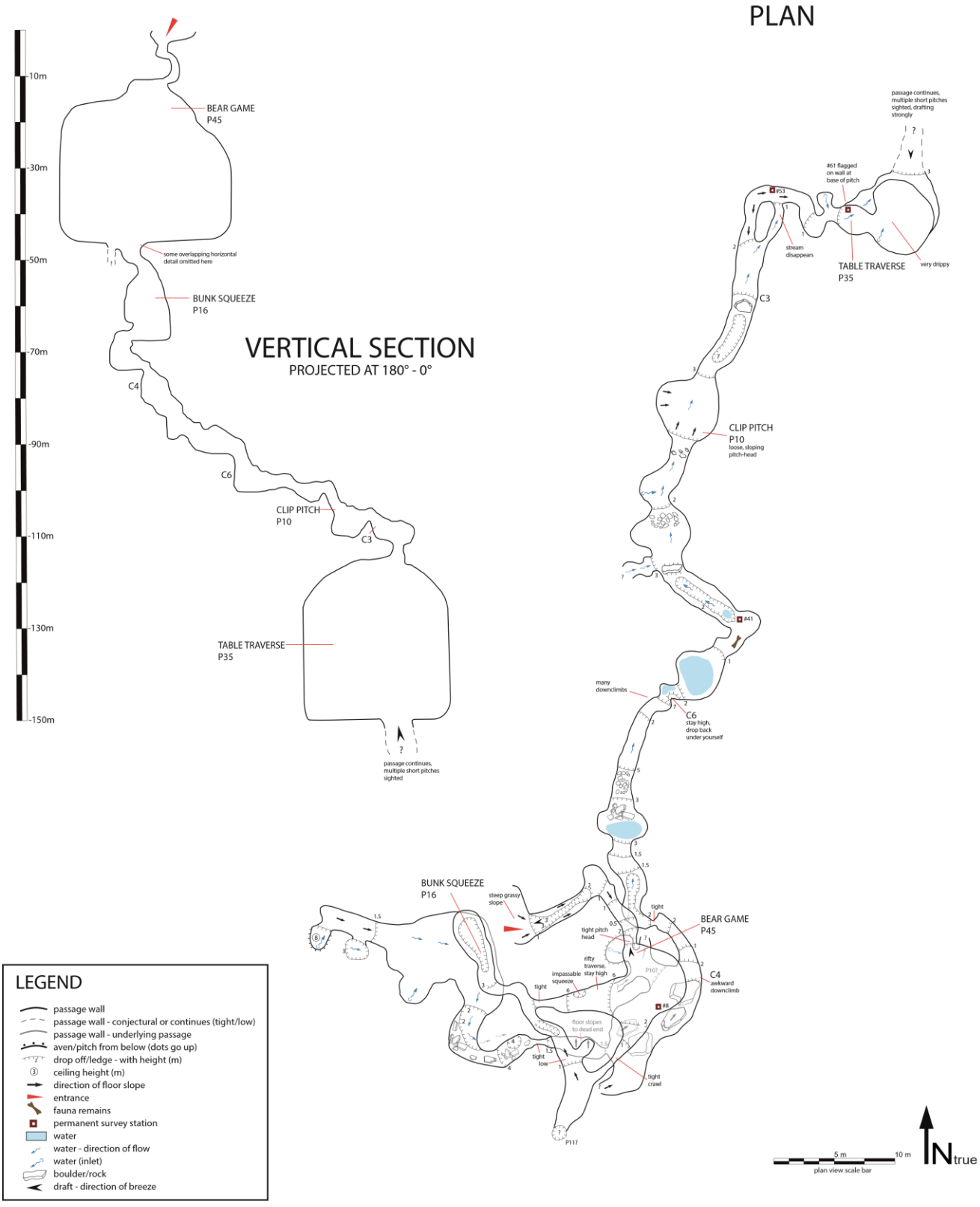
Mud, glorious mud…

I think they did a song about that……Ciara's in there somewhere

NO-435 Bloody Box Game (BBG)

Mt Owen, New Zealand

Southern Tasmanian Caverneers
NO435.STC558
ASF Grade 54
Surveyed by Karina Anders, Keith Chatterton, Jemma Herbert, Ciara Smart (19-20/03/2023)
Sketched in cave by Ciara Smart
Drawn by Ciara Smart (September 2023)
Surveyed Length - 278 m
Surveyed Depth - 148 m



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