Speleo Spiel 399

November - December 2013

Newsletter of the Southern Tasmanian Caverneers Inc, PO Box 416, Sandy Bay, Tasmania 7006, AUSTRALIA ISSN 1832-6307

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Front Cover: Waterfall in the Growling streamway. *Photo by Radim Knob*

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.

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Editorial

And so they say ... "better late than never".

This edition of the *Speleo Spiel* contains a spattering of trip reports big and small. Good to see both newbie and experienced caver trips are being run. That means that STC is getting new members and Alan gets his fix so he doesn't bother us too much. Having said this, Alan provides us with a characteristic rant that swings wildly from the sublime to the benign on his one true passion, putting bolts in caves under the pretence of making them safer for us all. "Other Exciting Stuff" contains a report describing the work that Rolan and myself made way back in 2010 documenting the "new" Lake Picton karst area in Southern Tasmania.

Matt Cracknell

Stuff 'n Stuff

JF-382 Dissidence

Based on the data and map of JF-382 Dissidence published in *SS*398 (p. 37) this cave is currently 3455 m in length making it the 10th longest Tassie cave and 321 m deep which puts it at #7 on the list of deepest caves in Australia [*Try to be consistent with your stats Ric, everyone knows that all the deep caves are in Tasmania – Ed.*].

Ric Tunney

National Geographic - Mystery Caves Of Guangxi

If you have ¾ hour spare sometime, you might like to watch this quite excellent You Tube clip (http://www.youtube.com/watch?v=wiYn-DeQjL8) about the origin of tiankengs and other associated river caves in Guangxi Province of SW China. The film features some British cavers, an American cave biologist and Chinese karst geomorphologist Zhang (Yuan) Hai from the Karst Institute in Guilin

Arthur Clarke

JF caving, January 2014

There will be a group of cavers from the mainland and myself camping in the JF from Jan 18 - Jan 27. On the 19th some people are heading into Cauldron. On the Oz day long weekend we'll be doing trips into Growling (probably to Dreamtime; mainly to take photos and as a recce to the sump to plan a dive trip) and maybe somewhere else. During the week we'll be heading into Warhol to check if there are some leads which were missed in the 80s and do some surface work around Wherretts Swallet/Constitution Hole etc. Sometime during the week there'll be a tourist trip to KD as well. Jan 28 - Feb 1 we'll be camping at the bottom of Niggly to push the 'final' rockpile and have a look at other leads. So far there is four of us. Feb 8/9 there will be a few mainland cave divers coming down to work on their SRT skills. We'll probably spend Sat above ground and head into some fun vertical cave on Sunday. Let me know if you're keen (via andreas.klocker@anu.edu.au) to join any of those trips (and are suitably capable, got enough domestic credits, etc.).

Andreas Klocker

Exitraviganza, February and March 2014

EXITraviganza 2014 (E2014) will be the last large hooray to complete (re)surveying and sketching of the known regions of the Exit Cave system. The unknown, well, it's unknown isn't it... E2014 will run over the two southern Tasmanian long weekends in Feb and March. If you are interested please contact Tony ASAP and visit. http://www.users.on.net/~opus405/exit_files/E2014_overview_document.pdf for details.

Tony Veness

Speleo Spiel #400

The Jan–Feb 2014 issue of the Spiel will be number 400. Feel free to contribute to this milestone issue by sending old or new material to the editor.

Matt Cracknell

Trip Reports

JF-463 Constitution Hole

Alan Jackson

26 October 2013

Party: Alan Jackson, Janine McKinnon & Dickon Morris

This was a trip to continue the survey tidy up and to progressively tick off the remaining leads.

First I moved through to the bottom of Hang Glider Pitch. While the other two caught up I ran a couple of legs up over the large flowstone-covered rockpile adjacent to the pitch and tied it in to the large vadose passage below. This would allow me to get a better handle on where that wall of the chamber is and also closes another loop which helps confirm the data is accurate.

Next we relocated to the Dick 'n' Balls aid climb to push the lead off the second large chamber the boys had discovered back in August (Morris 2013). It was quite large passage/chamber and quite impressive. Janine and I headed into the inlet lead off the far side of the large chamber at base level while Dickon scrambled up higher and traversed along jammed rocks. After a ~ 4 m climb down in narrow vadose passage (just past the limit of Dickon's previous exploration) there was a 20 m aven off to the side and narrow climbs up through boulders straight ahead. By now Dickon was 20 + m above us shouting and occasionally raining shit down on us. He appeared at the top of the nice aven and reported that there was no real way on, just more 'up' and inlets, so we fired a leg up the aven from a labelled pink tape (XY4) at its base. Dickon then dropped down to us via a series of climbs with lots of grunting and we surveyed our way back out to the chamber. Stations XY9-11, located across the large chamber, are labelled pink tapes. We linked back into an unmarked yellow tape at the bottom of Uphill Gardner (SSa03 in the electronic data) and then had a quick look at Uphill Gardner and the other passage in this area that connect back in with Hang Glider and the like; all very nice. Dickon declared his desire to call the inlet passage we'd just surveyed 'The Generous One' – something to do with some horrid chick his flat mate had been copulating with in the recent past. Conversation the whole day seemed to lurch from one sleazy topic to another – the problem with caving with a virile 23-year-old of little moral standing [*Maybe it has something to do with his name? – Ed.]*.

We relocated to the top of Happy Ending and then headed back into the passage that accesses Geologists Treasure/Stash. In Jackson (2013) I alluded to unfinished side passages. They're finished now. One did f-all but the other one was ~ 40 m long and very pretty. On our way out of here we ticked off another short inlet side passage, located an original station from the May push/survey trip (Jackson & Euston 2013) which helps align the old data better and then popped down to Happy Ending to strip the hangers and collect the rope from that short pitch, as we figured no one was going down there again anytime soon.

It was growing tedious by this point so we headed out. Because we got out so early we had a surface recce south of the entrance to see if we could find a feature that might connect to Uphill Gardiner. I found an entrance, with a slight draught, about 70 m south of the entrance (too far for UG) which will need looking at in the future. It was at least six metres deep but required a ladder or rope to see if it goes further. We then plodded back to the Serendipity turn-off, quickly ran a surface survey from JF-366 Asteroid Pot to the Serendipity turn-off star picket to complete the surface tie in started in Jackson (2013) and headed for the car.

We collected 191.5 m of underground data and 94.6 on the surface. JF-463 is currently sitting at 2355 m long. A couple more trips will be required to tidy up the known leads. Then I get to draw it up.

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MORRIS, Dickon 2013. JF-463 Constitution Hole – August Blitzkrieg Trips 5 & 6. *Speleo Spiel*, 398: 14-15.

Mole Creek Love In – Surveying, Kubla Management and Hammer Drills

Alan Jackson

16–18 November 2013

Party: Various members of STC, NC & MCCC

Rolan organised an inter-club love fest in November in the hope of getting the northerners surveying and producing low cost maps to facilitate his world domination karst management schemes. No one saw through his thinly veiled ruse so people turned up in their droves. We also took the opportunity, while all in the one place at the same time, to have a good pow wow about Kubla management. Parks put us up at the old Caves Guides House above King Solomons Cave and even did a bbq dinner and lunch for us. Luxury.

Saturday 16 November

The self-proclaimed STC surveying gurus stood up and waved their hands about in an attempt to educate their poorer northern cousins on the finer points of how to survey and the importance of being earnest. Only Northern Caverneers showed up, as despite RSVPing, the Mole Creekers failed to put in an appearance – it's becoming a bit of a trend, I'm afraid. We then split up into four small groups and departed for various caves to practise our skills underground. Most returned with as much hair as they'd departed with and we compared notes and anecdotes until the wee hours. All agreed that it'd had been a valuable day and many are keen to continue on the enlightened path of anal retention and its application to the sphere of cave surveying. It was a good thing.

Sarah Gilbert and Jill Bennett (NC) doing survey stuff at Cyclops Pot, Mole Creek.

Sunday 17 November

Rolan, Parks, STC, NC and MCCC (they turned up this time) sat down and had a surprisingly cordial discussion about the current situation regarding management of Kubla, the leadership accreditation situation, impending infrastructure upgrades, the survey project and discussion of possible future upgrades to track marking, cleaning and other infrastructure. If you're really keen on the detail then I'm sure someone can forward you the comprehensive minutes that Rolan recorded. It was a good thing.

In the arvo Rolan and I wanted to make a start on the implementation of the Parks infrastructure upgrade report that Parks engineer, Tim Chappell, had produced earlier this year. We roped Ric, Janine, Janice, Cathie and David into helping cart drills, bolts and chain to the MC-29 entrance (and then they carted some of the waste concrete from the old gate back down the hill).

Monday 18 November

Rolan and I continued with the upgrades in Kubla, installing and load testing lots of bolt and tape handlines, as well as investigating some of the ideas put forward during Saturday's meeting. There's a little more work to be done but most things were completed.

In summary, it was a valuable weekend and a great opportunity to not only make good ground on the surveying and Kubla stuff but generally foster the relationship between the clubs and with Parks. Thanks to Rolan and Parks for catering, accommodation and instigating the project and thanks to the clubs and individuals who attended and made it all worthwhile. (See, I can be nice when I want to be).

JF-337 Slaughterhouse Pot – JF-36 Growling Swallet Through Trip

Petr Smejkal

23–24 November 2013

Party 1: Petr Smejkal, Radim Knob & Miloš Dvořák

Party 2: Petr Smejkal & Radim Knob

It might be slightly confusing to see two groups with the same names, but there were truly two trips. Unfortunately the first one did not end in the cave but on the road 10 km beyond New Norfolk. Group 1 packed the car on Saturday and left Hobart at 8:30 am. Just 45 minutes later, we were stuck on the road with a boiling engine and we had to figure out how to get the car back to Hobart. Fortunately, my wife, Lucy, has RACT insurance so when she managed to find us we could call the tow truck. As you can imagine, the Saturday caving trip was a terrible disappointment.

Next day was more successful. We packed our little two wheel drive Holden Barina and went to JF at 9 am. We were 10

Radim Knob taking photos of glowworms in Glowworm Chamber.

Glowworms on the ceiling of Glowworm Chamber.

minutes on the road and Radim asked me if we had the key for the 8 Road gate. I realised that we had the key but unfortunately not in the car with us. We weren't in the mood to drive back, which meant the key stayed there. When we arrived in Maydena we sent a message to Alan and went to the 8 Road. Luckily, the Barina was small enough to pass around the gate and we stopped before the deep puddle that is on the road five minutes' walk from the carpark.

The water level at Growling Swallet was low and we arrived in the Slaughterhouse Pot at 11:30 am. The Slaughterhouse Pot was the very first vertical cave that Radim had ever visited and to get to the active stream took us approximately two hours. To get out of Growling took us another two hours as Radim tried (successfully) to do some nice photos of glowworms in the Glowworm Chamber. We get out of the cave at 3:30 pm, reasonably wet. Outside was a beautiful, warm, and sunny day. To get back to the car took us another hour and half as we were enjoying the beauty of the local rainforest in the sunlight, what a perfect situation!

It was pleasant day, and very rewarding after the Saturday failure.

IB-11 Midnight Hole

Alan Jackson

1 December 2013

Party: Jerri Clavant, Alan Jackson, Robert Krachler, Brecht Masschaele, Chris Sharples & Kjel ? (the other Belgian)

'The Belgians' were in Hobart, having contacted the club several weeks earlier expressing an interest in some caving, and a flurry of pre-Christmas beginners (the worst kind) were agitating for an appropriate trip. Since the only other people in the club who occasionally run beginner trips were in Mexico I figured I'd better do my community service for the year – ho, ho, ho and all that.

All the newbies were suitably interrogated as to their abseiling experience and, where required, pushed of the cliff at Freuhauf Quarry in the preceding days to give me some confidence that they weren't going to adopt the foetal position half way down the first pitch. They all passed. The party size was initially looking very large and I was planning for many ropes so we could have three pitches going at the same time but Kerrin went chasing orchids instead, Guy had an 'arse-plosion' and John (Webb) decided he'd aim lower for his first trip. Chris had only ever viewed the last pitch from the bottom and was keen to get a tick in the Midnight Hole box, so we were six.

The route up the hill is very poorly marked and plenty of tree-falls made for a tedious walk. This could do with an upgrade when the next party heads in. The descent of the cave was without incident, though it was surprisingly wet with plenty of spray on the final two pitches. At base level we touristed round Confusing Chamber, down the Laundry Chute, down to the Back End, back over via Skyline, then down to the Cephalopod Creek waterfall, back out into the main passage below Skyline, admired the glowworms and then toddled out.

Everyone was still smiling at the end so no doubt there'll be more beginner trips to run over the summer.

The obligatory Matchbox Squeeze photo with Jerri.

JF-4 Khazad-Dûm – righting some wrongs

Alan Jackson

14 December 2013

Party: Yoav Bar-Ness, Alan Jackson, Olaf Kähler, Dickon 'the boulder choke expert' Morris & Geoff Wise.

I was determined not to have yet another tourist trip down KD degenerate into a rant about crap bolting. I think I failed but at least I did something to improve the situation a bit.

Olaf is a German who lives and caves in the UK; Andreas has been caving with him recently and steered him my way after a conference he attended in Sydney. Olaf mentioned he doesn't like wet caves, so I lined up KD for him – I figured it was best that he learn I'm a prick right from the start.

The first part of the trip ran fairly smoothly, with only minimal eye rolling at the single useful bolt on the first 4 m pitch. A few murmurs were heard at pitches three and four and from then on we were in the streamway and we couldn't hear ourselves think, let alone acknowledge complaints pertaining to ordinary rigging – the water level was medium-high. I had come prepared for the first streamway pitch, having spent time in the past searching for an appropriate natural anchor to rig an approach line to the pitch head. Jeff's rigging notes in *SS*337 (Butt 2003a) suggest an extra 6 m of rope is useful to make a safe approach. I've always interpreted that to mean that there is a natural anchor somewhere within 6 m of the pitch head, but I've never found it. Geoff (Wise) pointed out the anchor he thought Jeff had used on a bolting trip in 2003 on which he had assisted (Butt 2003b), which was met with rounds of laughter. The first good natural anchor I can find is the jug on the right (looking down the cave) about 0.5 m before the pitch head. So I whacked in a bolt (well, I drilled the hole) on the left wall about 3 m back from the edge, at about shoulder height. While I did this, Dickon rigged the pitch, badly.

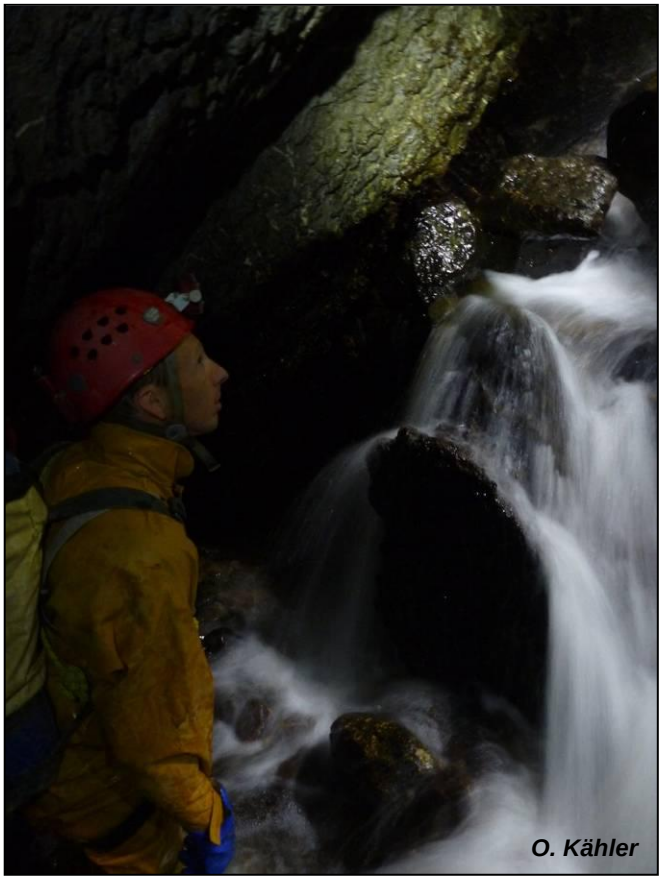
At the second streamway pitch I had already decided to abandon the ridiculous 'mini-bolt traverse' rigging Jeff installed. I climbed up to the platform, rigged a rope for the others off the first old eyebolt, then down the pitch off the other old eyebolt with a rebelay on the last p-hanger as per alternative in Butt (2003a). This was much more pleasant than the traverse. I'd only ever done it this way once, the first time I ever visited KD with Bunty rigging old school (before the p-hanger installation).

Then it was time for the dreaded fourth streamway pitch. Water levels were such that the furthest anchor along the ledge would be required to avoid prusiking in the water. I popped out and rigged it then headed back in to get the drill ready again while the others headed down. Once they'd safely negotiated this horror show I installed a bolt midway between the old eyebolt at the lip of the waterfall/pitch and the 'high level' natural anchor at the end of the ledge. This bolt will mean you can reach out and clip a cowstail into it while you still have your left foot on the nubbin next to the waterfall and your right foot on the big ledge (Janine might struggle to reach it from here, but we can't dumb all the caves down to her level), greatly reducing the risk of taking a plunge into the rock face and waterfall whilst rigging it. It will mean the 'low', 'medium' and 'high' water level natural anchors for the rebelay will all be much easier (and safer) to rig and negotiate. The bolt is about 1.5 m above the ledge and slightly round a corner, so you probably won't be able to see it from the chute/pitch approach, rather it will only be visible once you start abseiling out over the pitch head, looking over your right shoulder. It has a reflective marker on it.

At the sixth streamway pitch I kicked myself for not bringing the bolting gear down as I'd forgotten how hopeless this pitch is too – no approach line. The main hang is well placed but in order to get them well placed for high level trips they are a long way out on the right wall and the first one is reachy even for me (Janine would have to go home at this point). This one will have to be fixed another time.

We bottomed the cave, had a bit of a tourist and started heading out. Geoff almost paid dearly for having a joke at Phippsy's expense on the way in by dropping his hand ascender and foot loop down the sixth streamway pitch.

The damsel (not yet) in distress.



Alan looking unusually serene in KD.

Yoav looking serene in KD.

Gordon Group limestone and Yoav.

Luckily for him it was snagged on a tiny projection and didn't get swept down the final pitch the wet way. Geoff also took a cold shower on the stupid fourth streamway pitch rebelay – he has the damsel in distress thing down pat these days. With the new bolt here hopefully Geoff can claim to be the last person ever strung up in the waterfall on this pitch.

At the first streamway pitch I glued the previously drilled anchor in place and we headed slowly but surely for the surface.

New bolts – both bolts were glue in Fixe 10 mm 316 stainless steel eyebolts. Both have a reflective marker cable tied to them. NEITHER BOLT HAS BEEN FORMALLY LOAD TESTED YET, so use them at your own risk until I get back in there to test them (after which you should continue to use them at your own risk!).

Future work in KD

While the major clusterfuck at streamway pitch four has now been remedied (hopefully), there is still more to be done to make this cave properly rigged. Here are my opinions:

Pitch 1 (4 m) – the low old eyebolt is useless. Needs a second bolt up high to compliment the other one. Single bolts as primary anchors are bit 1980ish.

Pitch 2 (28 m) – nothing required.

Pitch 3 (9 m) – the existing y-belay is stupid but not dangerous (one bolt really high and the other too low). Nothing required.

Pitch 4 (21 m) – the approach line is tied back to a single late-1960s Loxin eyebolt, which is placed in the floor, lower than the primary anchors out in the rift. The primary anchors are a good 5 + m out along the rift. I back up this old eyebolt to the small calcite column behind the bolt, but even with that the situation isn't ideal. Two options – replace the old eyebolt with two new bolts much higher and/or install an intermediate bolt midway along the traverse on the left wall (or both). The safety of the ~ 45 year old eyebolts also has to be questioned. I've read every KD bolting trip report I can find and while it is evident that some of these bolts were condemned by Jeff and removed, the only criterion assessed seems to have been a visual inspection. I don't believe any of them were subjected to the 5 kN for 5 minutes test which was the standard at the time for the new p-hangers (this test is now 7.5 kN for 5 minutes). Perhaps this eyebolt (and all the others that remain) should be tested and their future considered based on the results.

It is also worth noting here that negotiating this pitch using a 27 m rope, as recommended in Butt (2003a), is impossible. Using a thirty leaves the rope at belly button height off the base of the pitch.

Pitch 5 (6 m) – first streamway (sw) pitch. With the new bolt it should be tickety boo now, but will have to see. Yes, it's a single bolt.

Pitch 6 (9 m) – second sw pitch. Place a new bolt (two if you believe my argument for Pitch 1 above) atop the platform (up on the wall instead of on the floor) for ascending the platform. Then place a second new bolt (or two) up on the wall somewhere to give easier and safer access over the pitch proper. This bolt could either tie in with the existing p-hanger over the lip, using it for a rebelay, or you could use the ENORMOUS natural to affect a rebelay.

Pitch 7 (5 m) – third sw pitch. Arguably nothing needs doing here, but it's a pity the first p-hanger (for affecting an approach line over the canyon step across) isn't located BEFORE the step across, but rather half way over it!

Pitch 8 (8 m) – fourth sw pitch. Hopefully the new bolt has 'solved' this pitch's problems. But there's a part of me that wonders whether the best route would be to avoid the chute altogether and traverse out over to the pitch via the higher level passage and drop down a completely water-free safe line to the floor. On a high level trip this would still mean a total drenching once off the rope to negotiate the curtain of water at the base of the waterfall, but death in waterfalls generally occurs while on rope, not while walking under them. It is worth noting that Jeff considered this option in Butt (2003c) and dismissed it for many reasons including my own thinking. Following the water is usually more fun anyway.

Pitch 9 (8 m) – fifth sw pitch. Currently all natural rigging and it could stay that way. It's a bit messy, as all the naturals are down low, but it works, is out of the water and we wouldn't want Rolan accusing us of homogenising the cave.

Pitch 10 (9 m) – sixth sw pitch. Desperately needs an approach line bolt a few metres back from the edge, even for low level trips where the risk of having your feet swept out from under you on the lip is low.

Pitch 11 (42 m) – tolerable as it is but the first p-hanger should have been placed a few metres higher, negating the rub generated between the natural and p-hanger. Worth fixing? If you're there with the drill already then probably.

Then of course there's the wet way proper from the entrance. From the bits I've seen, properly bolted, I think that could become one of the best ways to do the cave, particularly complete with a descent of the final pitch the wet way too. KD the wet way, all the way [*on ladders? – Ed.*], would be bordering on perfection.

Thank you for suffering yet another Alan KD rant.

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Alan and the waterfall.

Alan and the passage heading to the bottom of Dwarrowdelf.

Other Exciting Stuff

A New Karst Area Near Lake Picton

Matt Cracknell & Rolan Eberhard

In 2010 Forestry Tasmania engaged us to assess a newly discovered karst area in proposed logging coupes in State forest near Lake Picton on the western side of the Picton River valley. This followed an initial assessment by consultant geologist and one-time caver Luke Vanzino, which indicated the presence of hitherto unrecognised Gordon Group limestone and karst features including dolines, streamsinks and caves.

During the discussions with Forestry Tasmania, the karst area was generally referred to simply as 'PC034E', referencing the relevant logging coupe within their planning system. It is suggested here that 'Lake Picton karst area' is a more useful alternative for speleological purposes. The karst features are situated 2 km downstream of the lake on an un-named watercourse receiving its outflow. Other named natural features in the vicinity include Riveaux Creek, within an adjacent valley 1.2 km to the west, the Picton River, Mt Picton and the Picton Range. At the risk of provoking a tail chasing kind of discussion, alternative karst area names could be considered; however, for naming purposes, Lake Picton recommends itself due its proximity and speleogenetic association with the karst landforms.

Other clusters of karst features on the eastern slopes of the Picton Range include a large depression and sinking streams in dolomite on the flanks of Mt Chapman, an enigmatic spring in probable limestone on a tributary to Cook Creek, richly fossiliferous limestone cropping out in the bed of the Picton River, and karstic depressions and streamsink in limestone on the headwaters of Farmhouse Creek. The latter appear to flow in a westerly direction to emerge at Judds Cavern/Wargata Mina on the South Cracroft River. To complete the survey, there is dolomite on the Huon River at the northern end of the range, between Blakes Opening and Red Rag Scarp, and limestone at Riveaux. Forestry operations have been instrumental in improving our understanding of some of these karst areas. The majority, including Lake Picton, are located within the extended Tasmanian Wilderness World Heritage Area.

Our brief was to clarify the scale and significance of the caves, and to assess their broader systems context. We explored, mapped and photographed the four known caves, none of which proved to be more than about 50 m long or 25 m deep. We spent a lot of time looking for springs to account for the large volume of water disappearing into the principal stream, which engulfs the outflow from Lake Picton. We also searched areas adjacent to the known karst features for evidence of further karst, but found that the majority of features were located within a relatively compact cluster.

It was thought at first that water sinking underground below Lake Picton probably flowed in a southerly direction towards the Picton River, 2.5 km away. However, a thorough search backed up by water testing failed to identify any springs on the Picton River or in candidate tributary valleys. Based on a revised interpretation of the geology, we suggested that the direction of underground drainage may be northwards to the Riveaux karst area on the Huon River (Eberhard & Cracknell 2010). This potentially accounts for water emerging from a series of springs on the Huon River (not Riveaux Cave itself) noted during the earlier Riveaux karst study. The source of these springs was not determined during the Riveaux exercise, although it was suspected that they were fed by diffuse sources such as water percolating into slope deposits.

Our hypothesis concerning a hydrological connection between the Lake Picton and Riveaux karst areas has not been tested by water tracing, but is consistent with evidence concerning the geological structure. Specifically, the respective karst areas are probably situated at the northern and southern ends of a single horst block underlying Mt Riveaux, i.e. they are developed in limestone strata extending continuously beneath the mountain and cropping out in valleys on either side of it. Moreover, structural considerations imply that subsurface drainage from the Lake Picton karst area to the Picton River is impeded by impervious rocks within a downthrown fault block on the northern side. If correct, the inferred hydrological connection implies a subsurface breach of the topographic watershed between the Picton and Huon Rivers. The underground flow path potentially passes more-or-less beneath Mt Riveaux to emerge 7 km away and 320 m lower down.

The Lake Picton karst area is outwardly promising from a caving perspective, especially given the volume of water disappearing underground. However, all known caves are blocked close to the surface due to natural collapse and infilling by gravels. This is not unexpected as the karst features are no great distance downstream of Lake Picton, a glacial cirque and source of much dolerite-rich debris. The karst itself may at times have been overridden by glacial ice. The area of exposed karst amounts to a few hectares only and potential for further discoveries is limited.

The list below details the known caves. They have been assigned ASF numbers but not tagged. Physically numbering these particular caves is unnecessary and should be avoided. We have refrained from inventing names for them, although we use the self-explanatory 'Main Sink' in referring to the feature with that characteristic.

LP-X1 Cave 1

Length: 40 m, Depth: 25 m

The entrance is a steeply descending rift in the southeast corner of a solution/collapse type doline about 15 m in diameter and 5–8 m deep. A small stream enters the southwest margin of the doline and flows directly into the cave. A recent (< 1 year old?) landslip scour about 5 m long has developed on the southern slope of the doline directly above the cave entrance. A 6 m deep vertical drop just inside the entrance requires a ladder or rope to descend, leading to a chamber about 5 m wide. A narrow opening (squeeze) in the floor of the chamber provides access to a further vertical drop of 5 m into a second chamber of comparable size to the first. A low descending passage continues for a short distance, entering an area of limestone rockfall and the deepest explored point. Here, the cave stream disappears into narrow fissures between fallen boulders. A slight draft (direction undefined) was detected at this point.

Cave 1, Matt negotiating the narrow opening to the 5 m pitch that leads to the second chamber.

Cave 2, oncolites fossils in Gordon Group limestone.

The major portion of Cave 1 is developed within angular boulders (> 2 m) of limestone rockfall. Floor materials in the first chamber consist of sub-angular to sub-rounded boulders, pebbles and cobbles of Permian rocks, interbedded with granular to sandy sediments. A quantity of gravel and sand virtually choke the opening between the upper and lower chambers and has partially buried recent woody debris including treefern logs washed into the cave. Much of this material evidently accumulated following the recent landslide above the entrance. Finer calibre material is particularly noticeable in the lower chamber, which contains considerable silt and clay.

An unusual deposit of laminated fine sandstone resting unconformably within the limestone was observed in the lower parts of the cave. It is possible that this sandstone is a palaeokarst fill. Speleothem development is limited but a variety of forms (stalactites, stalagmites, helictites and flowstone) are present within an alcove off the lower chamber. The same alcove is floored by silty sediments that differ from the coarse, poorly sorted landslip debris.

LP-X2 Cave 2

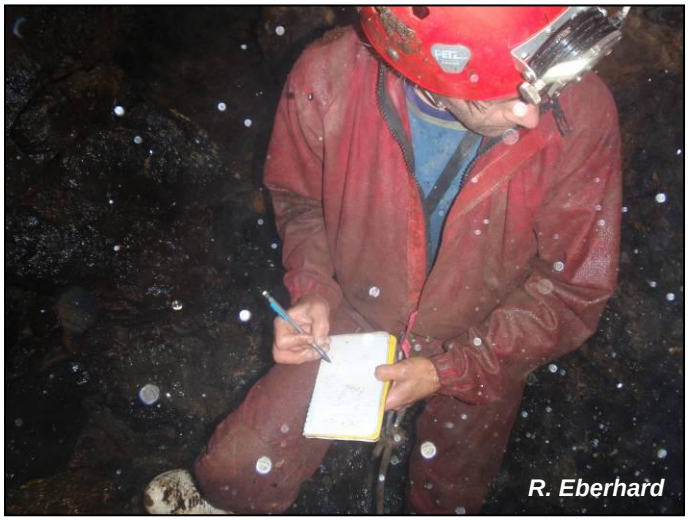
Length: 6 m, Depth: 6 m

Cave 2 (and Cave 3) is situated within the margins of a 30 × 15 m diameter SW–NE orientated depression. A stream enters this depression from the west and flows into a small solution/collapse type cave. The cave is formed in highly fossiliferous limestone with numerous large oncolites. Large angular boulders of Parmeener rocks partially fill the entrance. The stream disappears into impenetrable limestone rockfall at the deepest point.

LP-X3 Cave 3

Length: 53 m, Depth: 15 m

Cave 3 is located at the downstream end of an intermittently active 3-4 m deep channel that takes flood overflow from Cave 2. The cave has developed primarily within angular boulders (> 2 m) of limestone rockfall. Oncolite and gastropod (*Maclurites* spp.) fossils are clearly exposed in the cave walls, and there is localised secondary mineralisation in the form of moonmilk. A small daylight hole in the ceiling of a chamber immediately to the north of the Cave 3 entrance correlates with the base of 8 m deep collapse doline situated nearby. Rockfall gives way to limestone bedrock in the lower reaches of the cave. An unexplored continuation at the deepest point is partly choked with sand, gravel and pebbles derived from the overlying Permian rocks. A slight draft of indefinite direction was noted in the lower reaches.



Matt surveying in Cave 2.

Matt in Cave 3.

Cave 3, Maclurites *spp. fossils.*

LP-X4 Cave 4

Length: 5 m, Depth: 5 m

This cave is located in the base of a major solution/collapse type doline with a diameter of about 40 × 20 m (orientated N–S) and 5–8 m deep. The western wall of the doline is vertical cliff of Permian basal tillite. The unconformable contact between the tillite and underlying limestone is clearly visible at the base of the cliff. Oncolite fossils are present. A small landslide scour, similar to that at Cave 1, is located on the northeast flank of the Cave 4 doline. This feature exposes slope deposits of sub-angular to sub-rounded pebbles and cobbles of Permian and Jurassic dolerite clasts. A small stream enters the doline from the northwest and flows into a tight (0.5–1 m diameter) near-vertical hole in limestone bedrock. The cave terminates at a depth of about 5 m from the base of the doline at an awkward constriction.

LP-X5 Main Sink

This feature is the sinking point of a substantial stream that drains Lake Picton. The discharge of the stream in April 2010 was estimated to be in the order of 100 l/s. The water sinks into openings between large sub-angular to sub-rounded dolerite boulders in the base of the valley. Permian rocks crop out on the western side of the watercourse while the eastern side is formed in dolerite boulders. Despite the substantial amount of water that disappears underground, the boulders choking the streamsink precluded easy access to what may be a substantial cave beyond.

REFERENCES

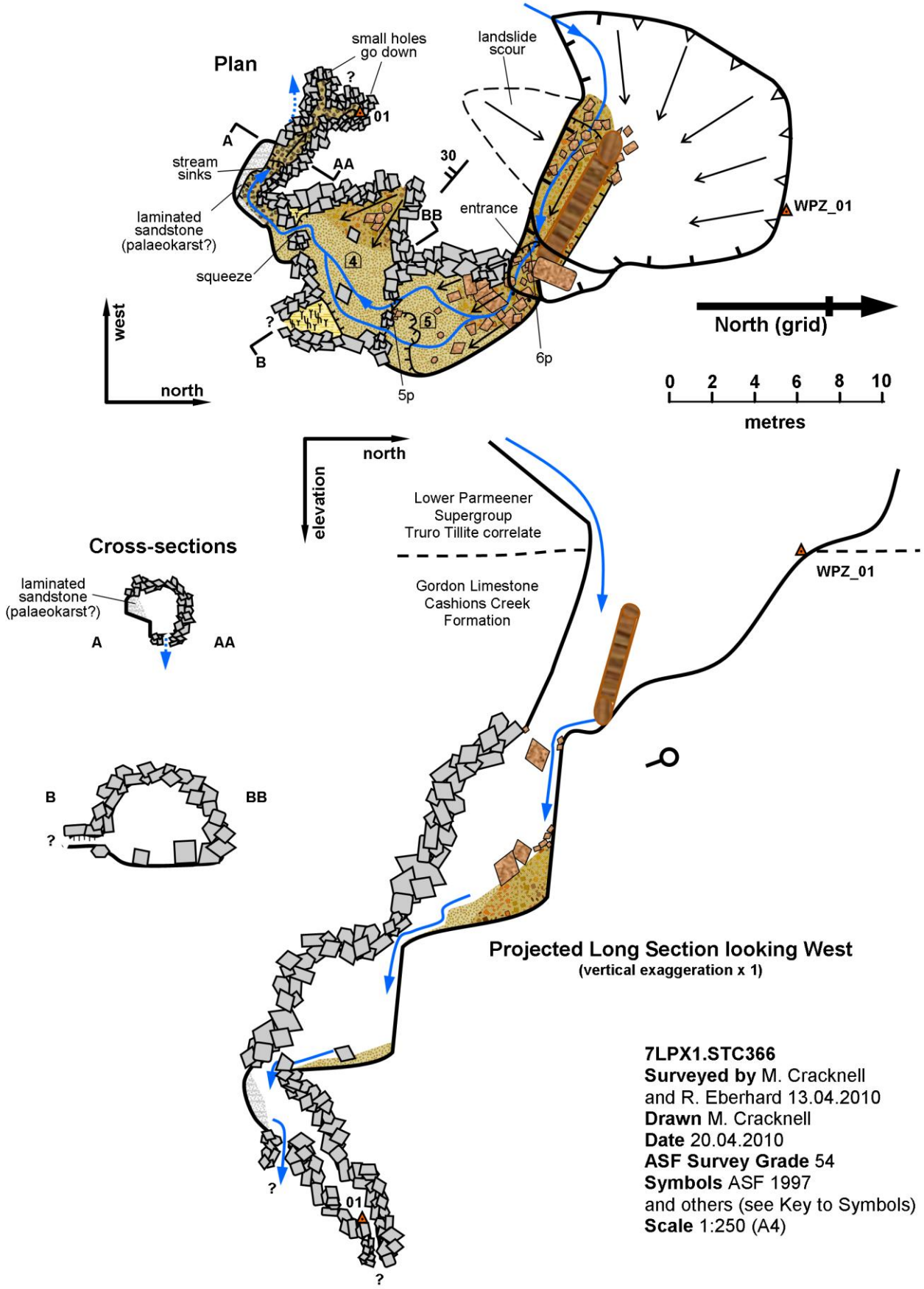
EBERHARD, R. & CRACKNELL, M., 2010; *Further Investigation of the PC034D/E/H Karst System, West Picton*. Department of Primary Industry, Parks, Water & Environment and Forestry Tasmania, June 2010.

[*Surveys of the caves documented in this report are provided in the following pages – Ed.*]

LP-X5 Main Sink.

LP-X1 Cave 1

Lake Picton, Tasmania



7LPX1.STC366
Surveyed by M. Cracknell and R. Eberhard 13.04.2010
Drawn M. Cracknell
Date 20.04.2010
ASF Survey Grade 54
Symbols ASF 1997 and others (see Key to Symbols)
Scale 1:250 (A4)

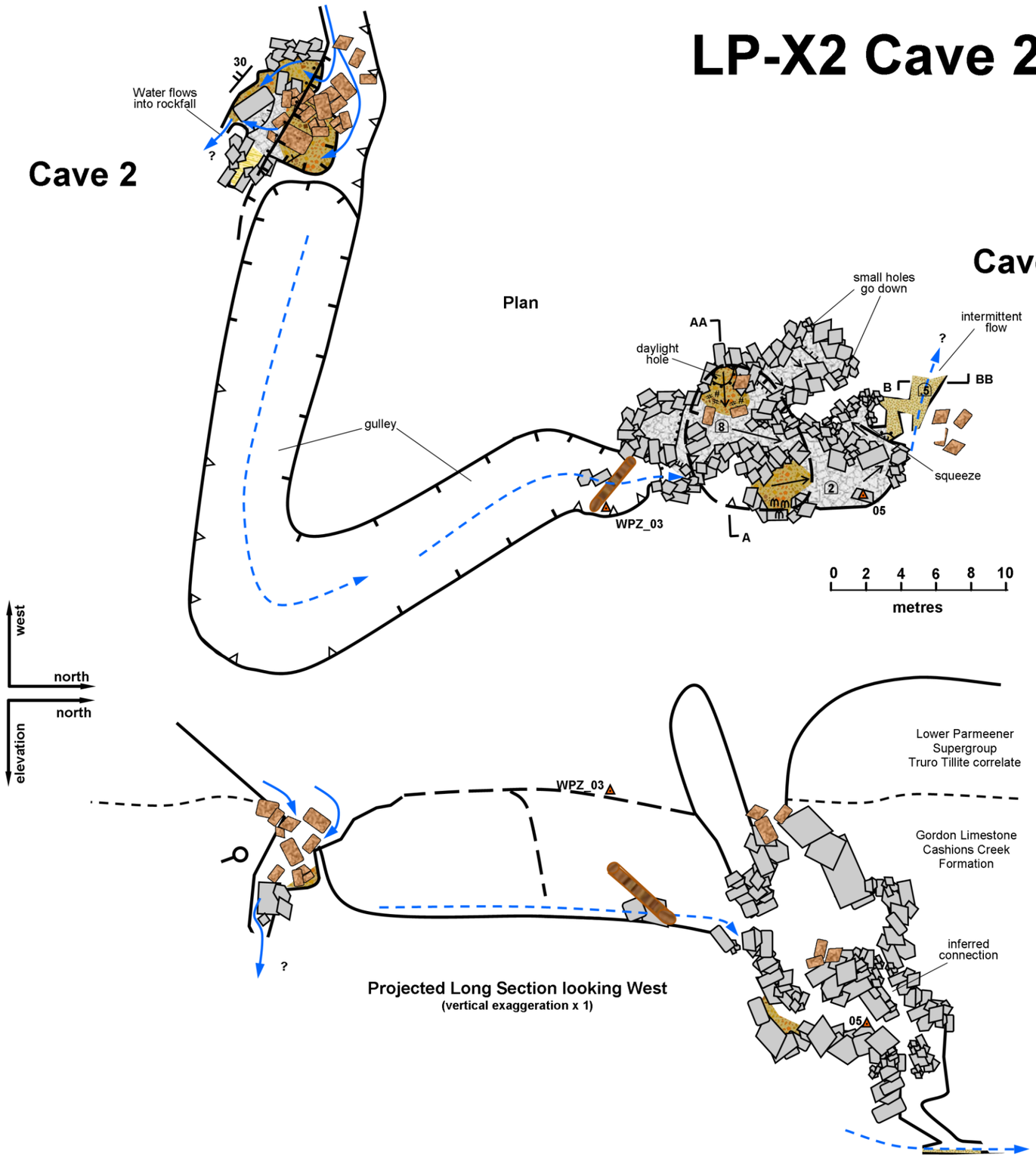
LP-X2 Cave 2 & LP-X3 Cave 3

Lake Picton, Tasmania

Cave 2

Cave 3

Plan

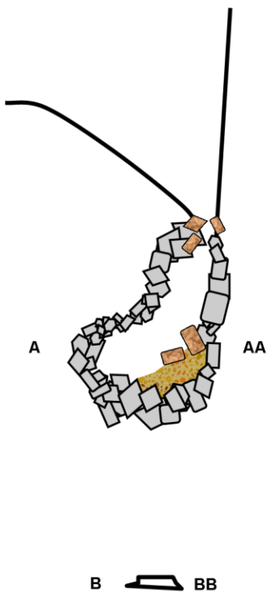


Projected Long Section looking West
(vertical exaggeration x 1)

North (grid)

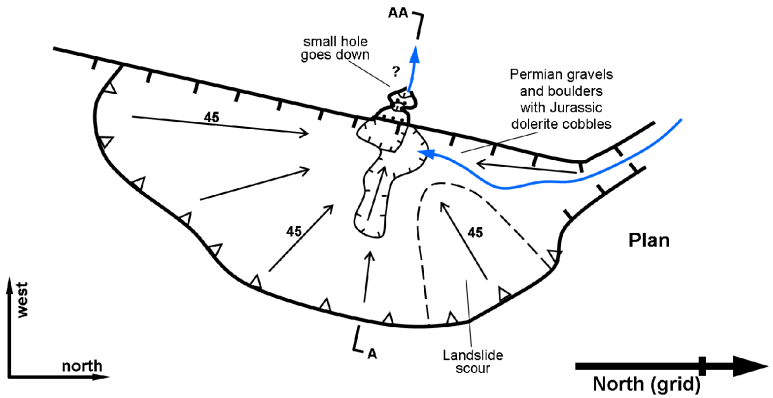
7LPX2.STC367 & 7LPX3.STC367
Surveyed by M. Cracknell
and R. Eberhard 13.04.2010
Drawn M. Cracknell
Date 03.05.2010
ASF Survey Grade 54 and 23
Symbols ASF 1997
and others (see Key to Symbols)
Scale 1:250 (A3)

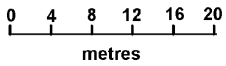
Cross-sections



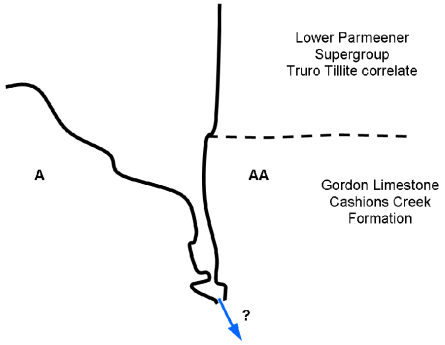
LP-X4 Cave 4

Lake Picton, Tasmania





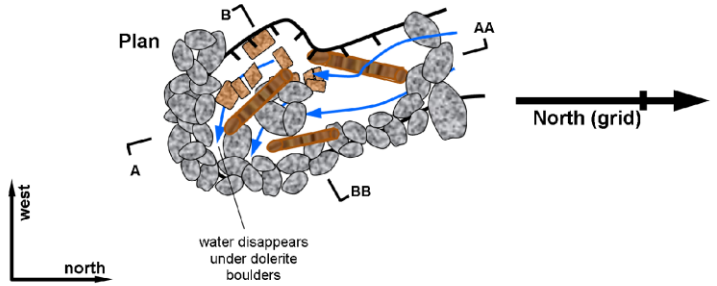
Cross-section
(Vertical exaggeration X 1)

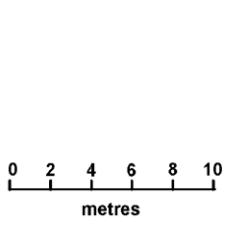


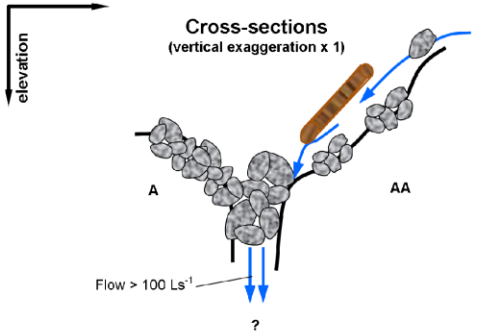
7LPX4.STC368
Surveyed by M. Cracknell
and R. Eberhard 14.04.2010
Drawn M. Cracknell
Date 22.04.2010
ASF Survey Grade 23
(sketch only)
Symbols ASF 1997
and others (see Key to Symbols)
Scale 1:500 (A4)

LP-X5 Main Sink

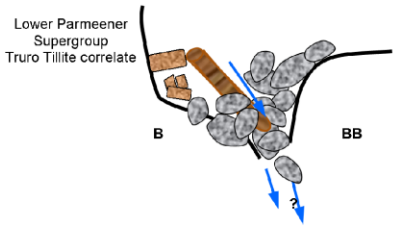
Lake Picton, Tasmania







7LPX5.STC369
Surveyed by M. Cracknell
and R. Eberhard 14.04.2010
Drawn M. Cracknell
Date 20.04.2010
ASF Survey Grade 23
(sketch only)
Symbols ASF 1997
and others (see Key to Symbols)
Scale 1:250 (A4)



Key to Symbols

Floor materials

- Silt and clay
- Permian sand and gravels
- Permian sand and gravels
- Limestone boulders (angular)
- Limestone rockfall
- Permian boulders (angular)
- Dolerite boulders (angular—rounded)
- Log

Cave deposits

- Moonmilk
- Helictites
- Stalactities

Measurements

- 30 — Bedding plane dip and strike (facing unknown)
- Bedding plane apparent dip (facing unknown)
- 2 — Distance to ceiling (m)
- 25 — Slope direction (°)
- 05 — Survey station (permanent)

Geomorphic/Hydrological features

- Water flow: permanent; intermittent; inferred
- Break in slope cliff; gradual; cliff (in-cave)

Symbols used are a mixture of symbols defined in the ASF mapping standards 1997.
Note: some symbols have been adapted to suit local characteristics

H1 golden stals.