UPSTREAM LOWER RIVER CAVE DIVING PROJECT

BY DEBORAH JOHNSTON

Divers : Rod Obrien, Deborah Johnston and Al Warild

November 2013 – March 2014

One of the traditional 'tourist trips' for adventure cavers at Jenolan is a trip to see the underground river running in Mammoth Cave. This is a reasonably leisurely jaunt with just enough crawling, contorting and scrambling to keep visitors of all types entertained while still being suitable for fit beginners.

A main attraction on these trips is seeing where the Jenolan underground river emerges suddenly and with great force from a small hole in the right hand wall of the passage, only to run across the surface a short distance before disappearing again. The sink for this river is many kilometres up the limestone valley, after which the water then follows an unknown course underneath various other significant wild caves, with the next sighting being here in Mammoth. To dive the river upstream holds promise of unlocking these kilometres of unknown cave passage.

Deb ready to go.
Photo by Greg Ryan.

Over the years, push attempts have been made by a few, however these dives have always been hampered by the sheer force of the flow which fights to push the diver back out. These divers typically made it through the difficult entrance squeeze before reaching a small chamber and being stopped by a tight, awkward rift about 6m in.

Getting gear to the dive site.
Photo by Greg Ryan.

Those who made it beyond the rift were immediately confronted with a tiny horizontal tube.

Al Warild and Rod Obrien had made the furthest progress, getting to a depth of -20m in these vertical shafts. Survey in here was always impossible as all four limbs were being used to cling to the walls pushing against the flow.

Towards the end of 2013, SUSS members had noticed that the water in Lower River was low. By November that year, Rod Obrien decided that it was low enough to try and survey the previously explored passage. Over the course of 9 trips to the cave a total of 11 dives were conducted, ranging from 30 minutes to over 2 hours. As the exploration progressed, there was a steady increase in the technicality of the dive planning, the amount of gear required, the amount of people required to move gear, and the time spent underwater.

Logistics

After entering the water and rounding a corner, the diver immediately squeezes though a flattener which usually involves removing one or both tanks, and digging out some gravel to fit. The squeeze opens up into a space big enough to sit up in, then through a short but tight rift just large enough to squeeze through sideways standing up holding tanks overhead or out to either side. After this the passage becomes a small rounded tube which follows a series of vertical shafts and horizontal flatteners. At no point does it become large enough to turn around in, so divers must enter feet first and push themselves backwards with their elbows, dragging their detached tanks along with each heave. The diver fills the majority of the space in the tube which makes pressure of the water difficult to push against, even in these drought conditions. The water is 14 degrees, but the speed it rushes past makes it similar to standing in a wind tunnel with body heat torn away in the flow.

To complicate matters, the walls are razor sharp in spots meaning a drysuit is unlikely to survive (as at least one poor soul found out the hard way in years past), and additional protection of hoses is a must.

To streamline our profiles in the water Rod and I did all dives in 7mm wetsuits with pockets to remove 'dangly bits' a plain webbing harness instead of BCD, and tough dairy boots or rock boots over wetsuit socks with no fins. To protect our hoses Rod made small cordura bags with a loop that hooked over the tank valve and two velcro straps to wrap around the cylinders, with hoses simply tucked inside. Our primary and backup lights were all attached to our helmets, with no additional cords protruding.

SUSS Project Dives Nov 2013 – March 2014

The first dive was conducted on the first weekend of the November weeklong at Jenolan (November 30th, 2013), with Rod digging out the restriction at the very start of the dive which is a tight tube that fills with gravel. After passing this squeeze, he then began repairing the existing dive line that had broken due to flooding in the past.

The next day (December 1st) we returned and Rod began to survey the passage, mapping around 20m of passage down to -15m during a 90 minute dive.

The Monday after, Al Warild did a 35 minute dive to check the dive line further in and repair any breaks so it was ready for Rod to survey. He reached the end of the line and found that he was able to continue further due to the reduced water pressure, and laid another 25m of dive line down a vertical shaft before his reel ran out at a depth of -31m. All dives to this point had been conducted using two 7l cylinders of air with no decompression obligations reached.

The following Saturday (December 6) Rod did another 90 minute survey dive. As this dive was likely to require decompression, he using nitrox in his 7l cylinders to extend the amount of time he could spend underwater before having to make decompression stops. The next day I dived to the end of the line to push the end of the cave and lay line ready for Rod to survey. At this point we discovered that where Al had tied off was at the base of the final shaft (-31) before the passage becomes more horizontal and makes the first change of directions. At this point the passage suddenly swung 90 degrees to the left and began following a steep cobblestone slope. I began digging the cobblestone slope but progress was slow as the rocks were solidified with a tough coating of black silt. Rod dived again the same day and continued his survey. At this stage we decided to begin staging an additional cylinder with a high oxygen percentage nitrox mix to speed up any decompression that may be accumulated on future dives.

The river, looking downstream. Photo Greg Ryan

Two months later (February 7-8), Rod and I returned with crowbars attached with bungie cord to our cylinders to tackle the cobblestone dig over a weekend. Over the course of three long dives Rod and I dug through the cobblestone slope reaching -41m depth. The nitrox mix we were breathing would become unsafe to use beyond this depth so the dig was terminated at this point. No adequate tie off points were located along the length of the slope so the dive line was reeled back in after each dive. Each dive required some decompression, however this was minimised by the use of a 32% nitrox bottom mix and breathing 78% nitrox from a 5l deco cylinder staged near the end of the dive. We decided that with the increasing depth the following dives would have two decompression cylinders for additional safety. It was unfortunate that drysuits couldn't be worn as we became especially cold during the ends of our dives which made hauling gear out of the caves more strenuous.

Rod, gearing up. Photo Greg Ryan.

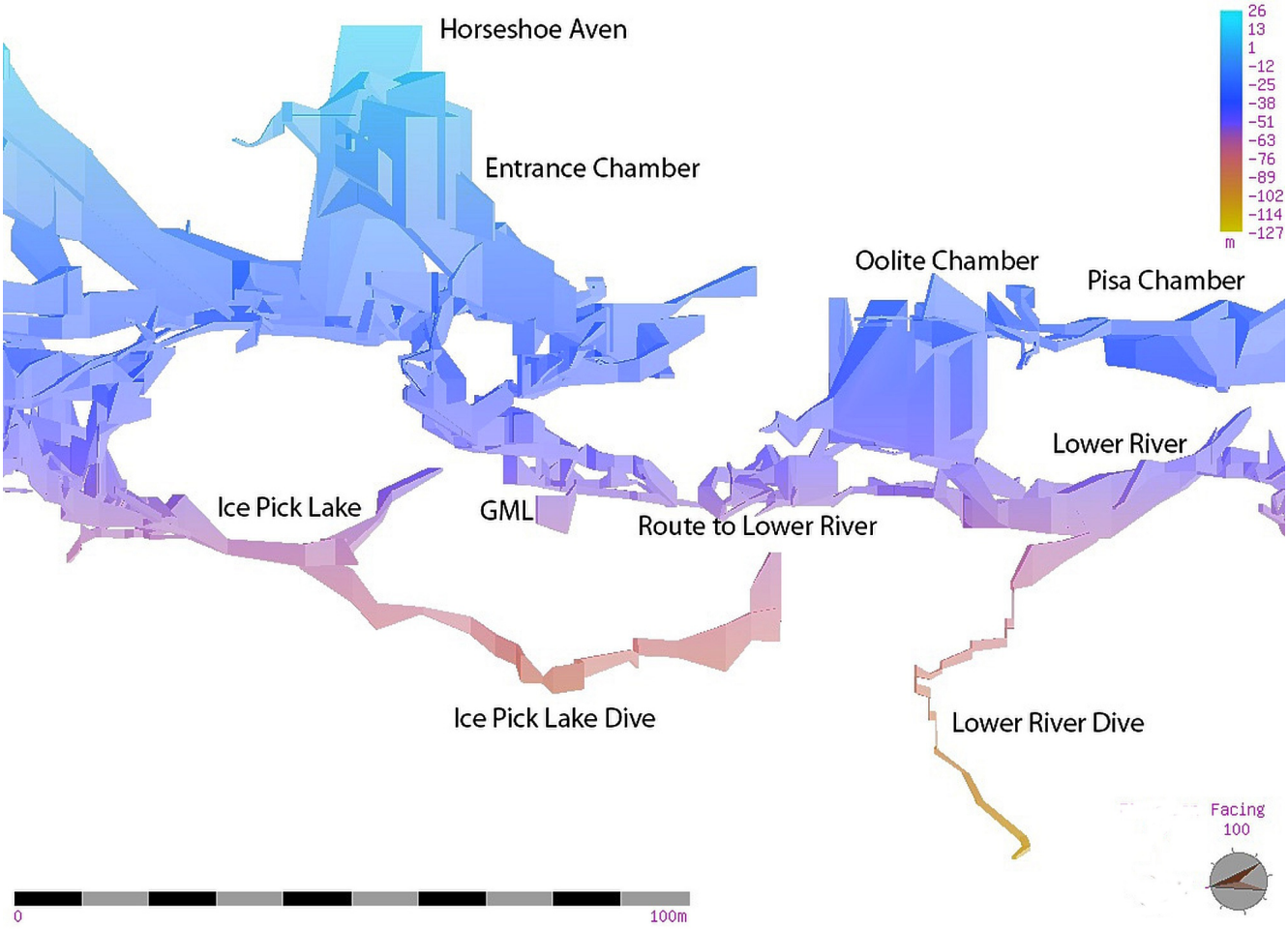
The next month (March 8) we returned with air in our tanks again, however this time one 7l cylinder had been replaced with a 12l and both tanks contained air.

We weren't sure how difficult it would be to negotiate the tight passages with these heavier and bulkier cylinders so Rod (known for his upper body strength) did all dives from this point on. First he staged the two decompression cylinders, then he made his way to the end of the dive with a 7l and 12l tank. To make the large tank easier to manipulate we gaffa–taped a layer of foam around it for buoyancy which worked extremely well. He also took some small lead shot weights to use as anchors for laying dive line down the sloping passage. Rod broke through the end of the cobblestone slope on this dive and found that the floor of the passage changed to a large sand bank that required digging. It was decided the dig would require two 12l cylinders

of air to be safe. He laid 35m of line in a 1.5hr dive which included a fair amount of decompression. The depth reached was around -50m, although the passage could be seen to continue to around -55m depth.

Decompression in this dive is always very cold as the water rushing past is akin to standing in a wind tunnel, with your body heat being torn away from you. At this point we decided that extra thermal protection was required to continue. Rod had been wearing a two-piece 7mm wetsuit but the air cells in the fabric had been squashed over the course of many recreational deep wreck dives down to -60m in the ocean. He went shopping and bought a new wetsuit and a sharkskin undershirt before the next trip.

Two weeks later (March 22) we returned with two 12l cylinders of air, and two 7l cylinders of nitrox for decompression. During a 2hr dive Rod completed the survey to the end of the line at the start of the steep sandbank. Attempts to dig the sandbank showed that it was unstable, with the risk of collapsing down the slope and trapping or burying the diver too high to continue.



Lower River dive map

Survey by Rod Obrien
Map by Phil Maynard

Number of trips: Rod Obrien (9 trips), Deborah Johnston (8), John Wooden (5), Steve Kennedy (3), Greg Ryan (2), Al Warild (2), Timothy Byf (2), plus Rick Grundy, Tom Begic, Felix Ossig-Bonanno, Thomas Wilson, Ian Cooper, Phil Maynard, Adam Hooper, Brenda Carr, Jessica Circosta, Hayden Hall, Hannah Mugford, Kati Stuart, Ben?? (1 trip each).
And a special thanks to Phil Maynard who is plotting all of the survey data onto his overall Mammoth map.