

AUTUMN

MULU CAVES 2019

An Anglo-Malaysian Expedition to the
Gunung Mulu National Park, Sarawak



REPORT
on the findings of
THE MULU CAVES 2019
EXPEDITION

to the
GUNUNG MULU
NATIONAL PARK
SARAWAK

During October 2019

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Maps & Diagrams by Hugh St. Lawrence & expedition members



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Dave the lizard at Camp 5

Frank Pearson

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Strangler Fig in the Melinau Gorge

Frank Pearson

Cover design by Hugh St.Lawrence from photos by Tom Smith (front cover) & Helen Fairclough (rear cover).

Front cover shot Rob Middleton on Mother of all Voids pitch, Hurricane Hole

Abstract

Mulu Caves 2019 was the 28th Anglo-Sarawak Expedition to Gunung Mulu National Park and operated in the field between 4th October and 2nd November 2019. The team consisted of 13 members from the UK. The expedition was enabled and assisted by Sarawak Forestry, National Park Management and the logistical support of Veni Enar and local people.

The expedition had two main parts, both of which relied on invaluable local support:

- 1) The main team of nine based at Camp 5 in the Melinau Gorge to explore leads in Whiterock Cave, Blackrock Cave and in Hurricane Hole on Benarat.*
- 2) A second team of four based in the Research Centre at Park Headquarters to explore leads in the northern Snake Track area of Clearwater Cave.*

Part One – Based at Camp 5 in the Melinau Gorge

Up to nine cavers were based at Camp 5 for three and a half weeks where leads in both Whiterock and Blackrock Caves were explored and surveyed. A key element of this part of the expedition was to re-explore parts of Blackrock with powerful modern lighting as much of the original exploration had been achieved with carbide lamps. This area of the Clearwater System had not been entered for a decade and team members hoped to find leads that could eventually enable further connections with both Whiterock Cave to the north and Clearwater Cave to the south. Many leads had also been identified in Whiterock Cave from previous expedition reports and surveys all of which could be accessed from the underground camps at Africa, Propeller and Flying Monkey. The Blackrock leads would be explored from both Monkey Camp and Africa Camp.

*New cave was discovered in **Blackrock Cave** though not as much as had been hoped. However, the assumed connection to Blackrock from the Africa section of Whiterock via the Dancing Queen passages was confirmed and significantly reduces the travelling and rigging time to Blackrock from the entrance. New cave was discovered above the Firecracker stream way and in the region of the Blowpipe. **A total of 230 metres was discovered.***

*In **Whiterock Cave** a considerable amount of new passage was found off the Daydream Believer, Out of Africa, Green Wing and Medusa areas of the cave. Together with a number of smaller discoveries **a total of 7 kilometres of cave was discovered.** A 25m rising shaft at the top of a ramp in the Clickbait Series was not climbed but could be a good candidate to pursue in the search for the fourth horizon (similar to Creedence in Clearwater Cave) which must exist above Whiterock's known levels.*

*The exploration on Benarat was focussed entirely in **Hurricane Hole** which had been discovered by the 2000 expedition and partially explored in both 2003 and 2009. The purpose of this expedition was to complete the climb of the huge shaft known as 'The Mother of all Voids.'*

*The team pushed the shaft 97 metres above the window and 200 metres above the floor. There appeared to be 50 metres above them to the roof of the shaft when the drill batteries ran out. There was a hint of passage at the top, but confirmation of this will have to await a further push. The current top of the climb is level with Hole in the Moon Cave near the top of the Benarat Cliff, and the shaft had an average diameter of 60 metres. **An additional 272m of passage was discovered nearby.***

Part Two – Based at the Research Centre at Park Headquarters

An initial team of four cavers were based at the Research Centre at Park Headquarters with leads in the northern part of Clearwater Cave as their objectives, accessed by the Snake Track Entrance to the cave on the western escarpment above the Melinau alluvial plain. They were in the field for two weeks. They followed leads established by expeditions in 2014, 2017 and 2019. It was hoped these leads, at the northern end of Clearwater Cave, could intercept new passages at the Creedence level heading towards Blackrock and Whiterock caves.

*Though no anticipated connections were made by the team a **total of 1.9 kilometres of newly explored cave was surveyed**. This partially concluded the leads left by the Easter 2019 expedition based at Park Headquarters although some leads off East passage remain.*

*A reduced team of two resurveyed the Revival section of Clearwater Cave from Boulder Chamber to Scumring and tied it into the recently (2018) resurveyed section of the main passage in Clearwater One. This will provide a clear spine through this part of the system from which to accurately identify the starting points of branching passage ways. **A total of 4.5km was re-surveyed***

Two members of this team moved up to join the Camp 5 part of the expedition as three members of that team left for the UK.



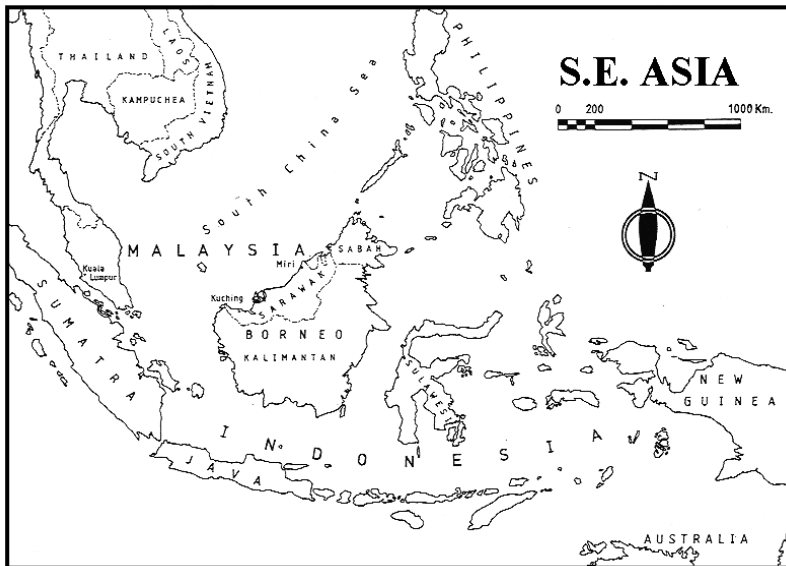
Monkey Camp in Daydream Believer, Whiterock Cave

Tom Smith

INTRODUCTION

LOCATION

The Gunung Mulu National Park is situated in north-eastern Sarawak, with its northern boundary forming part of the border with Brunei, (Figs. 1 & 2). It was officially constituted in 1974 and opened to visitors in 1985. Lying 4° N. of the equator it covers an area of 528sq km.



The Park is dominated by the sandstone mass of Gunung Mulu, which rises to 2376m. To the west of Mulu, and on its flank, lies a band of 'Melinau' limestone, which forms the lesser peaks of Gunung Api and Gunung Benarat. The lower slopes are covered in dense tropical rainforest, which rises to meet the montane forest of Mulu's upper slopes.

Figure 1: SE Asia

Mulu is a rich mixture of plant and wildlife and in the limestones, beneath the forest canopy, lie some of the world's most impressive caves.

HISTORY of EXPLORATION in MULU

The existence of large caves in the Gunung Mulu area of Northern Sarawak has been documented for over 150 years. In 1858 reference was made to "Detached masses of limestone, much water-worn, with caverns and natural tunnels" around the base of Mulu by Spenser St. John in his book *'Life in the Forests of the Far East'*, (St. John, 1862).

St. John was 'Consul General in the Great Island of Borneo' and made some of the earliest exploratory journeys of any European into the interior of Sarawak. His attempts to reach the summit of Mulu were thwarted by limestone cliffs, dense forest and sharp pinnacles of rock and he says, "It is almost impossible to conceive the difficulty of ascending this mountain". Mulu was to keep the secrets of its summit for a further 74 years until Edward Shackleton successfully climbed the mountain during the Oxford University Expedition of 1932, (Harrison, 1938).

In 1961 G.E. Wilford, of the Malaysian Geological Survey, visited the area to explore its caves. His work included the surveying of Deer Cave and parts of Cave of the Winds. He predicted that Mulu would yield many more caves in the future, (Wilford, 1964).

During 1977-8 the ***'Royal Geographical Society Mulu Expedition'*** spent 15 months in the area studying many aspects of the rainforest. This was the largest scientific expedition ever to leave the

UK. Included in the team were six speleologists who, in three months, explored and surveyed 50kms. of cave passages including parts of Clearwater Cave, Green Cave and others, (Brook & Waltham, 1978).

During the expedition a forest camp was established in Hidden Valley from where two major caves were explored. 'Wonder Cave' on the north side of the valley was found to have some of the largest passages in Mulu. 'Prediction Cave' on the south side also contained enormous passages which were almost filled with river sediments, (Meredith, Wooldridge & Lyon, 1992, p.10).

It was obvious from these findings that Mulu ranked as one of the world's foremost caving regions.

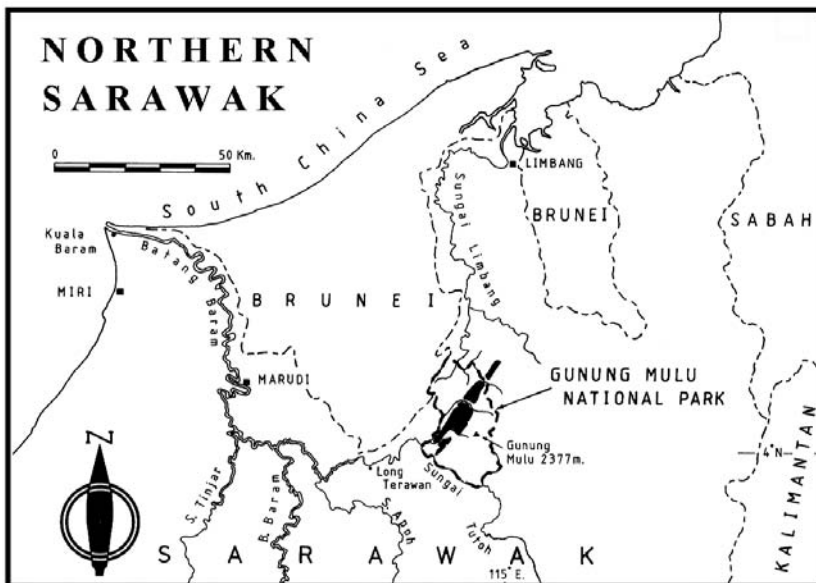


Figure 2: Northern Sarawak

As a result of the RGS expedition two large scale caving expeditions were mounted in the early '80s. The '**Mulu '80**' expedition explored and surveyed a further 50km of cave passages, including the largest underground cavity, in the world, 'Sarawak Chamber', which forms the final chamber of 'Lubang Nasib Bagus' or 'Good Luck Cave', (Eavis, 1981). The end of this chamber lies very close to the end of Prediction Cave in Hidden Valley and tantalising draughts at the end of each cave suggested a connection.

In 1984, the '**Sarawak '84**' expedition spent one month in the field and explored 54km of caves. Clearwater Cave was extended by 14km but a great deal of work was carried out in Benarat, where Cobweb Cave was discovered, adding a further 15km of passages to the Benarat total. Sarawak Chamber was also photographed for the first time.

These two expeditions carried out a great deal of scientific research associated with the caves, including dye tracing, geology, geomorphology, ecology, cave mineralogy, etc. However, although 150km of some of the largest caves in the world had been surveyed, some very significant areas of limestone remained totally unexplored, presenting enormous potential for further exploration, (Fig. 3).

During late '87 and early '88 plans were made to mount another caving expedition to the area. This would be the first expedition to visit the park since its opening to the public in 1985 and was primarily aimed at exploration, surveying and photography. Unlike the previous expeditions this was to be a lightweight venture with only six team members. The '**Mulu Caves '88**', expedition once again proved the potential of Mulu with a further 16km of passages explored. It was also shown that exploration in Mulu using a small team was both feasible and successful.

The major discovery of this expedition was Blackrock Cave lying to the north of Clearwater and almost certainly part of the same system, (Kirby 1989, p.28).

As a direct result of this discovery, an eight strong group, including five of the 1988 team, returned to the Park exactly one year later as the '**Mulu Caves '89'** expedition. Once again a lightweight venture proved to be successful, with over 24km of passages explored and surveyed in only one month. Major extensions were found in Clearwater Cave, totalling 15km, and the gap between it and Blackrock Cave was brought to within 90m. The Clearwater 5 streamway was discovered and explored for over 1km.

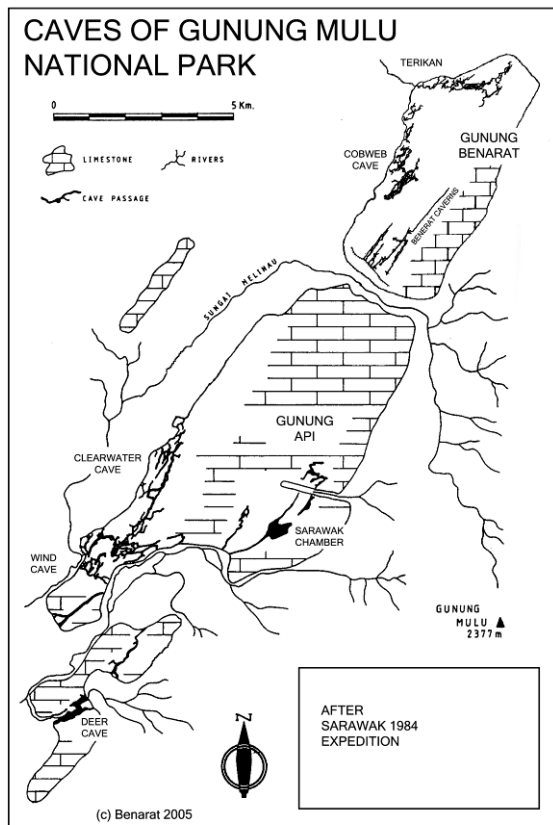


Figure 3: Exploration up to 1984

A new cave, provisionally named 'Simon's Cave', but later named 'Racer Cave', was discovered and explored and water tracing experiments proved a hydrological link from the Melinau Gorge through Blackrock and into Clearwater Cave, (Kirby, 1990). The discoveries made by these two expeditions had greatly altered the map of Gunung Api's caves.

During 1990 another British team visited the Park and continued the exploration of Racer Cave. The Clearwater 5 streamway was explored to an upstream sump. Although a sump bypass was found to lead into Clearwater 6, rain caused the bypass to sump which prevented further exploration (Weight, 1990). A physical link was established between Drunken Forest Cave and Alexandra Palace in Clearwater.

During February 1991 a Korean Team visited the Park. Some minor discoveries were made. Unfortunately these findings were not published.

In 1991 a group of nine explorers, five of whom were from the '88 and '89 expeditions, returned to the Park to continue exploration in the Blackrock/Clearwater area. A connecting passage was discovered which linked the two caves. This discovery made the Clearwater System the seventh longest cave in the world at over 102km. This was the '**Mulu Caves '91'** expedition, (Fig 4).

A vast amount of work had, by this time, been carried out on the western flanks of Gunung Api and although discoveries were by no means exhausted it was becoming increasingly difficult to find major objectives which would justify another expedition to that side of the mountain. The remaining significant lead, the Clearwater 6 Streamway, was weather dependent and, therefore, could not be relied on as a sole objective.

Attention now focused on the more challenging eastern flank of Gunung Api with Hidden Valley as the first objective. This area was less accessible than the west as there were no major rivers which could be used for transport of stores and equipment.

Tentative enquiries were made in 1990 to see whether it would be possible to visit the Valley during the '91 expedition. A positive response was received and this became one of the secondary aims of that expedition. Unfortunately this was not achieved as other discoveries closer to park

headquarters took priority. Instead, part of the '91 team returned approximately one year later in January 1993 as the '**Hidden Valley '93**' reconnaissance expedition with the sole objective of carrying out a lightweight reconnaissance of Hidden Valley.

The reconnaissance expedition proved a success with potential for further discoveries to be made in the two known caves within the Valley and a new cave discovered in the dolines to the west. Other entrances were noted for further investigation and surface reconnaissance suggested even greater potential further south in the deeper 'Third Doline', which was not entered.

With the Hidden Valley reconnaissance expedition indicating potential for further discoveries in Hidden Valley a full exploratory expedition, '**Mulu Caves '96**', was mounted and returned to the Park in October 1996. A base camp was established within the Hidden Valley gorge between the entrances of Prediction and Wonder Caves. Although very little was found within the main gorge exciting discoveries were made in the dolines to the south west. Arch Cave was explored in the second doline. Prediction and Bridge Caves were found within the third doline and the fourth doline revealed Cloud Cave which matched Deer Cave in scale. During the last few days of the expedition a descending boulder ramp was followed which led into the far reaches of Cobra Cave. This established a through route to the Melinau Paku valley.

During 1997 an American expedition, which was exploring Gunung Buda, carried out surface searching on the northern slopes of Benarat. This led to the discovery of Deliverance Cave on the north east corner of the mountain. 3.5km of passages were explored which were heading in the general direction of Cobweb Cave.

With the success of the '96 expedition a second Hidden Valley expedition, '**Mulu Caves '98**', was mounted which returned to the Park in February 1998. As the centre of exploration was to be in the dolines it was known that this would not be best served by a camp within the Hidden Valley gorge. Not only would a camp in Hidden Valley be remote from the caves, it would also be almost impossible to supply without helicopter backup, which would be very expensive and could not be relied upon.

With this in mind, a gamble was taken on being able to reach the 4th Doline from the Melinau Paku Valley via a route, over the surface, which had never been explored. It was thought that the route through the caves would be used only as a back up, however, the severity of the climb up from Nasib Bagus, together with the surface terrain proved to be far more difficult than the underground route via Cobra Cave, which soon became the main thoroughfare.

This expedition proved a great success with further extensions in Perseverance Cave and a connection established between Cloud and Bridge Caves establishing the Cobra – Cloud – Bridge system at 16.1km. with a vertical range of 459m, the greatest vertical range of any cave in the Park.

Owing to the El Nino year, river levels were exceptionally low so a further attempt was made to explore beyond the Clearwater 5 upstream sump into Clearwater 6. This led to another sump which was bypassed into Clearwater 7 and the inevitable upstream sump which was not passable. This expedition was the last to visit Hidden Valley.

Another American expedition visited Buda in 2000 and carried out further work in Deliverance Cave, bringing its total length to 4.3km.

With exploration in Api now without any significant leads the attention of the British team was drawn to Gunung Benarat. It had been sixteen years since a British expedition had visited the

mountain, during the Sarawak '84 expedition. The **'Benarat 2000'** expedition continued the exploration of Cobweb Cave, where a further 10.7km of passages were explored bringing the total length of the cave to 25.9km.

As a follow up to the 2000 expedition, the **'Benarat 2003'** expedition returned to the park. A further 4.4km were explored in Cobweb Cave, but the significant discovery of the expedition was made in Terikan Rising Cave where 12.5km of passages were explored. Included in the team were two Api veterans who were to use the expedition, based at Camp 5, as an opportunity to prospect the northern slopes of Api between the Melinau Gorge and Blackrock's Racer entrance. This revealed a significant entrance 2.8km south west of Camp 5. The cave was named Whiterock and within the remaining three days of the expedition it had revealed 3.7km of new passages. Owing to its proximity to Blackrock, it was thought that it would soon connect and might be of little significance.

During 2005, the **'Benarat 2005'** expedition, based at Camp 5, continued the exploration of Whiterock, which exceeded all expectations when a further 17.2km of passages were discovered, mostly lying above Blackrock. Two connections were made between the two caves, which linked Whiterock into the Clearwater System.

On the Benarat side of the gorge an attempt to climb up to an entrance high in the cliffs opposite Camp 5 was cut short when a small entrance was discovered only 60m above the ground. This cave was named Moon Cave and was explored for 6.6km in an almost straight line into the mountain. A connection was also established with Benarat Caverns making the total length of this system 16.4km

Included in the expedition were two divers who investigated the sumps in the Terikan system. This proved connections between the individual elements of the system to make a total length of 32.5km.

The total length of caves surveyed in Benarat was now 90.4km and in Api was 172.6km.

During January and February of 2007 the **'Mulu Caves '07'** expedition continued the exploration of Whiterock and Moon Caves. Significant discoveries were made in the northern section of Whiterock, where two major passages were discovered, both of which came to within 400m of Camp 5 with no apparent entrances/exits found. These two passages, the Northern Line and the 1954 Series, ran northwards in parallel with 60m of vertical separation.

A great deal of in-filling was carried out, with new passages providing short cuts between previously discovered trunk routes. This reduced considerably the travel times to the northern reaches of the system. These discoveries extended the known cave to 42.9km. A major success of the expedition was the connection of Moon and Cobweb caves via an unexplored passage in Moon Cave. This connection linked Benarat Caverns, Moon Cave and Cobweb Cave to produce the Benarat Caverns System, which ranks as the second longest system in the Park at 50.7km. In the Melinau Gorge, considerable surface survey work was carried out to tie together all the known caves on the Api side of the river and link these back to the datum at Camp 5. This allowed them to be linked into the Survex master dataset. Some minor entrances were explored in this area.

During January to March of 2009 the **'Mulu Caves 2009'** expedition continued to explore Cave and discovered a further 24km of passages. Owing to the proximity of the northern passages to the cliffs in the Melinau Gorge, a considerable amount of effort was given to establishing a northern entrance. Five days were spent attempting to gain entry via a small cave to the east of Camp 5. Unfortunately this ended in a boulder choke with a draught emitting, within 100m of Whiterock. A significant discovery in Whiterock brought its northern passages to a point underneath the Pinnacles track and even closer to Camp 5. Late in the expedition a steeply descending ramp off 1954 led into

the Whiterock River, the upstream continuation of Clearwater streamway. Although not fully explored, this streamway was left at a point 60m beneath Camp 5 with potential for further discoveries.

During May 2010 a small team visited the Park. The '**Mulu Caves 2010**' expedition was to be a small-scale venture, based at Park headquarters, with the aims of photography, science and surveying. Modern digital images were made of the caves close to Park headquarters. Further samples of speleothems, sediments and quartz were collected to enhance the scientific programme. 14.6km of surface survey was completed to tie together all the known entrances in the Southern Hills. Although not a primary aim of the expedition, a small amount of exploration was carried out, with 2.4km of previously undocumented caves explored and surveyed.

During 2011 the '**Mulu Caves 2011**' expedition spent two months in the field. This was a two-centre, two-month expedition the first month based at Park HQ and the second at Camp 5. The expedition successfully laser scanned the vast Sarawak Chamber allowing volume calculations for be made. Radio-location was used in Whiterock Cave and the Melinau Gorge to determine the precise position of the end of the cave in relation to the surface topography. A series of Geodetic GPS fixed points were established around the park to better understand the relative levels of the caves within the Survex dataset. In Whiterock Cave 13km of new discoveries were made. A series of sampling was carried out for Uranium series dating.

The '**Mulu Caves 2012**' expedition was to be the 20th in the series of Angle Malaysian ventures and was based at Park HQ. A series of high level caves were found in the Melinau Paku valley with Train Cave extending the Cloud/Bridge/Cobra system to 20km. Attempts to connect Lagang's Cave into Racer Cave were unsuccessful but the cave was extended to 5.7km

October 2013 saw the '**Mulu Caves 2013**' expedition based at Camp 5. Scientific work was carried out in Whiterock cave to better understand the geology and geomorphology of this area. Further sampling was carried out for uranium series analysis. A further 7km of new passages were explored in Whiterock Cave and Deliverance Cave at the northern end of Benarat was re-visited without any major breakthroughs.

During April/May of 2013 the '**Mulu Caves 2014**' expedition was focused on exploration at the southern end of Gunung Api. Based at Park HQ the expedition continued the attempt to connect Racer and Lagang's cave into the Clearwater system. Although the connection was not made a new cave was discovered, Easter Cave which proved to connect with the higher levels of Racer Cave. The significant success of the expedition was to discover the 8km of passage in the Creedence series which forms the fourth horizon of development 450m above base level confirming the existence of higher levels within the cave. This discovery pushed the total length of the Clearwater System to over 200km.

The '**Mulu Caves 2015**' expedition was an ambitious project centered on three locations, Southern Api, Hidden Valley and Camp 5. In Hidden Valley a lightweight recce was carried out to investigate a large entrance identified from helicopter video footage in the north wall of the gorge. This revealed Conviction Cave which connected into Wonder Cave, unfortunately a serious accident curtailed some of the work here. Further exploration was carried out in Racer and Lagang's caves but no connection made. From Camp 5 8065m of new passages were explored in Whiterock Cave where a new level was entered 100m above anything previously discovered. This was 380m above the lowest part of the cave confirming the existence of higher levels within the cave and potential for far more discoveries in the future.

During April 2017 the first of two '**Mulu Caves 2017**' expeditions visited the park and was based at Park HQ. Further work was carried out in southern Clearwater and in Cave of the Winds where the Eureka series was discovered lying just above the river passage.

The second expedition was based at Camp 5 during October where 4.2km of new passages were explored in Whiterock Cave bringing the total length of the cave to over 100km and the Clearwater System to 226.3km (Fig 4). Within just 15 years Whiterock had become a 100km cave, the longest cave in the Park.

During January of 2018 the Mulu Caves 2018 expedition were in the Park for two weeks to carry out draught logging experiments in Clearwater, Cave of the Winds and Whiterock. The team were based at both Park HQ and Camp 5 from where a drone was used to prospect for caves. Some resurveying work was carried out in Cave of the Winds.

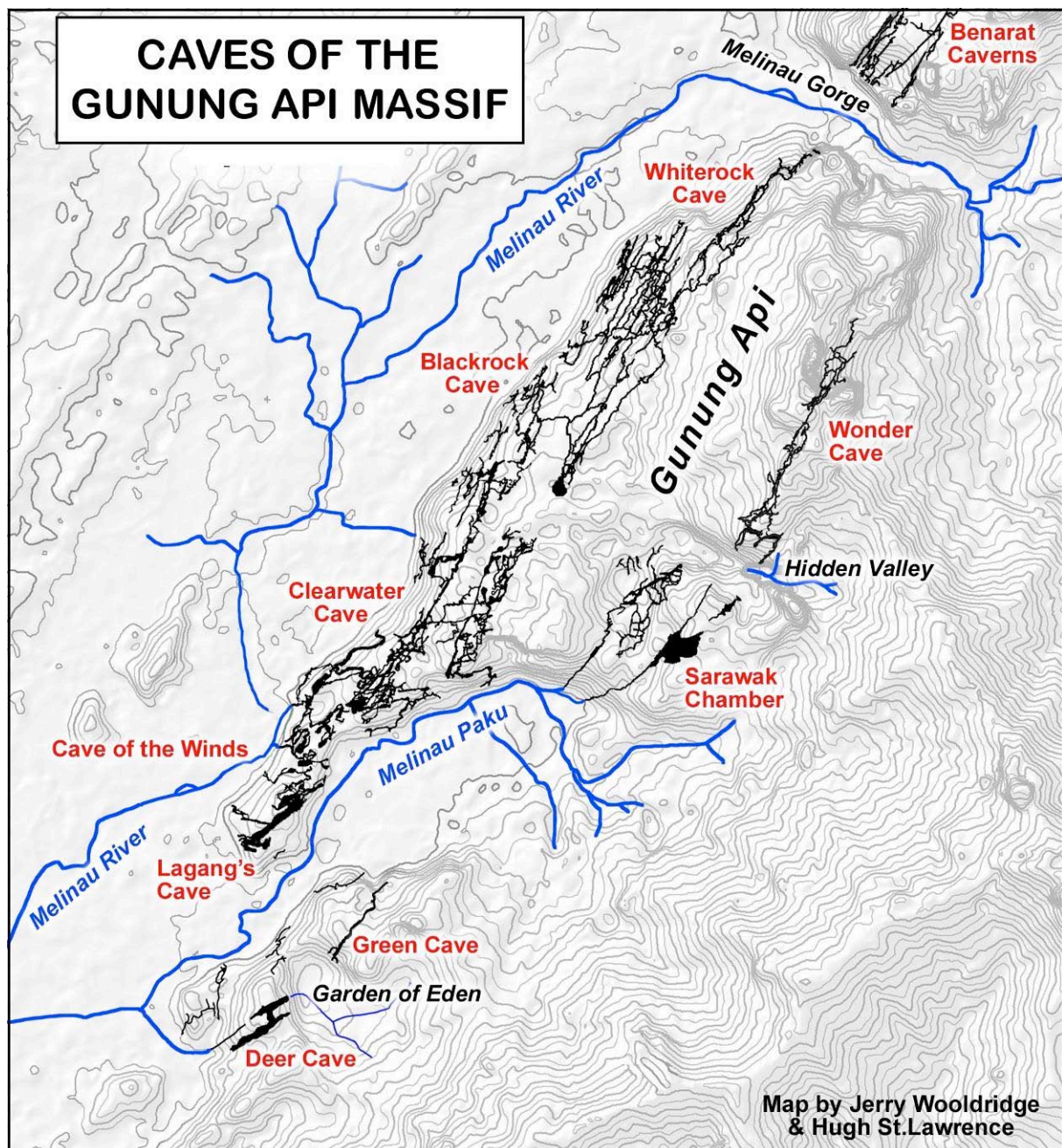


Figure 4: Caves of the Gunung Api Massif

Background to the Expedition

The 2015 Expedition to Whiterock had located and partially explored a fourth horizon of the cave in the Swift Progress series above The Apprenticeship, although this had been truncated by surface erosion and calcite blockages. However, it provided evidence of development at this level, comparable to the Creedence Series in Clearwater. An expedition in 2017 had searched again for this horizon, unsuccessfully despite several passages leading to strongly draughting chokes. This expedition was driven to search again for a route into the elusive high level.

While pushing the lead off Apprenticeship in 2015, Last of the Summer Wine, the upper part of Out of Africa and Dr Disto's Ramp had been much travelled and a promising lead was noted heading off from Dr Disto's Ramp into a considerable 'blank on the map' between Apprenticeship and Api Birthday. This could provide not only new passage but a chance of climbing up to the fourth horizon beyond the blockages of Swift Progress which was not far away.

It was also 10 years since the last exploration into Blackrock and a lead from the 2018 expedition suggested a new and much more convenient way in to that cave from inside Whiterock. Initially the plan was to re-access the cave from the forest entrance, but this plan was dismissed when the only person who knew the way could not join the expedition.

Blackrock had been explored using carbide lamps and, since the onset of much more powerful LED lighting, had also been overlooked as the enormous potential of Whiterock had been and continued to be exploited. It was felt that another look at sections of the cave could yield more leads.

On Benarat, a key objective was to pursue the huge shaft lead in Hurricane Hole discovered in 2009 and descended to a choked floor. However, the shaft appeared to continue upwards for at least the same distance as the 90m to the floor. The thought of a vast vertical tube running up behind the Benarat cliff, in marked contrast to the horizontal nature of Moon Cave, made an intriguing target for exploration.

The 2018 expedition had looked for leads in the Armistice area of Clearwater and had traversed the system from Cave of the Winds to Snake Track Entrance, an exciting through trip. This had generated interest in this long neglected part of the cave, along with thoughts of finding further connections with Blackrock Cave. The Easter 2019 expedition had this exploration as one of its objectives and had left two promising leads in the Dune Series and China Shop. Along with exploration done in 2014, these possibilities at the northern end of Clearwater, close to the connection with Blackrock, provided the impetus for further examination.

Preparations and Approach

As neither of the expedition leaders had previously led expeditions to Mulu (though both had considerable experience as expedition members), preparations were always going to provide a swift education. Prior advice from previous leaders (Dick Willis, Matt Kirby, Tim Allen, Andy Eavis and Ben Kent) proved helpful as did a series of notes, lists and leads from our most recent expedition leader, Mark Brown. Mulu veteran and data analyst, Hugh St Lawrence provided, as usual, a wealth of clear, incisive and extremely practical information on leads and access to parts of the cave. However, as must always be the case, the essential advice, help, support and direction came from our massively experienced and knowledgeable logistics organiser, Veno Enar who we met in Miri at the beginning of October. Further essential help and advice was provided by Rambli Ahmad of Sarawak Forestry and Hein Gerstner, the National Park Manager, and Bian Rumei, Park Office

Manager. Without their help, advice and generosity the expedition would not be possible. Both expedition leaders have gained considerable experience and knowledge from them all.

The purchase of a generator, fridge, fuel, both base camp and underground camp food, camping equipment, medical and hygiene supplies, stationary and personal items was done over a two-day period. The objects and non-perishable equipment were packed in boxes and waterproof bags and loaded onto Veno's contact, Leo's 4x4 pick-up and driven to Long Terawan. From Mulu Veno, having arrived with us at Mulu airport, went with Jimmy Jarau in his boat down to Long Terawan and there picked up all the boxes and ferried them up the river to the Mulu jetty, where we loaded everything onto two trolley loads and moved them over to the Research Centre. The perishable food was flown with us to Mulu and everything, even the several trays of eggs, arrived in one piece.



Heading up-river

Frank Pearson

All the gear and food for the Clearwater team was packaged, itemised and left securely in the expedition store at the Research Centre and messages were sent to their leader indicating all the necessary notes and advice.

We repacked everything over two days into 20kg porter loads. A shortage of porters meant that they were sent up in order of importance over a three-day period. The five initial Camp 5 members were joined by the remaining four on the Sunday and all nine went up the river on three boats on the Monday. The river being low, they had to get out and push. Everyone and all the gear made it to Camp 5 where the team was very well established and ready to go.

The generator and fridge were wired up and electrical leads set up for the PCs, printer, laminator and numerous battery chargers. The end dormitory was saved for the expedition where we and all the gear fitted in well. The expedition cook was Steve Lian who provided excellent food throughout at

all times of the day – and night. Steve is a crucial member of the expedition; he fuels all the cavers and keeps them going.

Weather Conditions

Perhaps surprisingly the weather can be quite variable in Mulu and in the Melinau Gorge in particular. The weather had been relatively dry in the weeks preceding the expedition, so much so that the boats carrying the Camp 5 team had to be pushed up the shallow sections of the river. However, over the period of the expedition (October) it rained every afternoon, with some days having increased rainfall. Teams on underground camps experienced massive increases in the flow of water down through the various horizons and one team in Blackrock was stranded on the wrong side of the Blackrock River and had to sit out the flood. Another team in Blackrock returned to their pitch out of Zahara Dessert to find it lost beneath a substantial waterfall.

One team that headed up the Melinau Gorge, and the cliffs at the eastern end, continued round the back of the Api into the large catchment area below Gunung Mulu and found it raining heavily there. On their return to Camp 5 they saw the river rising rapidly and once there joined the population of the camp watching the river transform into an express torrent and avalanche of mud, rocks and trees, rising to the its high-tide mark on the bank beneath the riverside shelter – almost all the steps having been submerged. This rarely happens and other days had had heavier and more prolonged rain at Camp 5 though no such rise in the river level. This must have been caused by heavy rain in the catchment above the gorge.

It is always worth bearing in mind the movement of rain clouds and the area of Mulu in which they deposit their load. There was concern about this surge in water as the boatmen would not have been able to navigate the river up to Kuala Lutut (and Camp 5) in such conditions.



Melinau River in flood

Frank Pearson

Summary of Underground Exploration

EXPLORATION IN GUNUNG API

Exploration in Clearwater Cave

The discoveries in Clearwater, as logged in Survex, were:

- China Shop
- Just another Squiggle
- Go Dither
- Sheer Delight Climb



The expansive camp site in the Dune Series

Colin Boothroyd

China Shop 1 & 2 *length 307.38m - explored 16th October*

Explored by Colin Boothroyd, Pete Hall, **Dave Nixon**, Brendan Sloan

A minor bed was pushed west of the main Revival Bed. One aid climb and a series of free climbs lead to a small amount of horizontal development at 235m elevation.

Just Another Squiggle (off Dune Series) *length 1259.37m - explored 17th October*

Explored by Colin Boothroyd, Pete Hall, **Dave Nixon**, Brendan Sloan

A passage was found leading off the Dune Series in the form of a small ramp heading steeply up via sharp surroundings for 72m at which point it breaks into the floor of a moderately sized passage (8x10) heading north and south.

South went for 457m to a draughting choke which is almost certainly the underside of the Baba Yaga choke in Creedence. Big draught but despite best efforts was impassable.

North was pushed for 802m in much the same fashion as the southern extension. It is on the same horizon as China Shop, so 235 elevation but the next bed east. It was left open and draughting strongly towards the explorers heading north. It is currently the most northerly part of Clearwater being just beyond the previous limit of Clearwater but 178m higher.

Go Dither (off Boulder Chamber) length 390.46m - explored 18th October

Explored by Colin Boothroyd, Pete Hall, **Dave Nixon**, Brendan Sloan

Passage leads off the east wall of Boulder Chamber. It is a by-pass to Beckoning Finger and brings you out in Dune Series.

Sheer Delight Climb not surveyed - explored 19th October

Explored by Colin Boothroyd, Pete Hall, **Dave Nixon**, Brendan Sloan

Climb at the end of Sheer Delight into the Dune Series left permanently rigged as it provides easy access and avoids the necessity of Beckoning Finger and the 12m pitch.

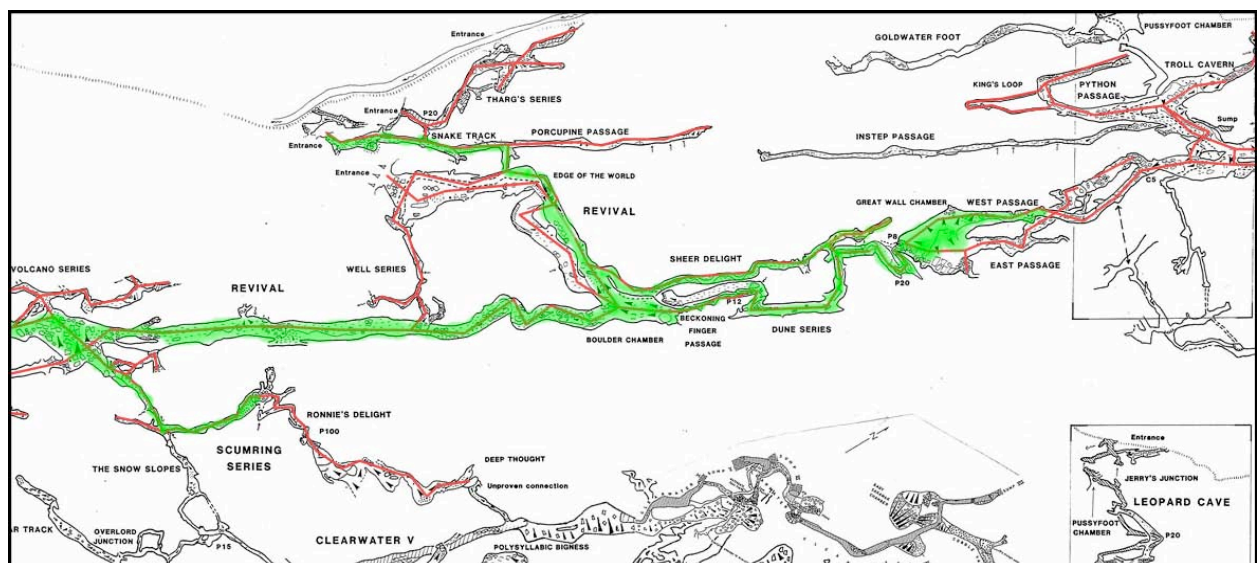
Resurvey Work in Clearwater

Colin Boothroyd and **Dave Nixon**

New survey tags were fitted to the entrance of Snake Track and in Boulder Chamber.

As part of the ongoing project to replace fake data with real data, a total of 4595.63m were resurveyed as follows:

- Snaketrack to Revival; 1562.1m
- Revival to Scumring; 1197.66m
- Dune-Boulder Chamber; 1316.55m
- Great Wall to Sheer Delight; 106.57m
- Little and Large Connection; 412.75m



Plan showing resurveyed areas highlighted in green and red lines showing areas still to be resurveyed



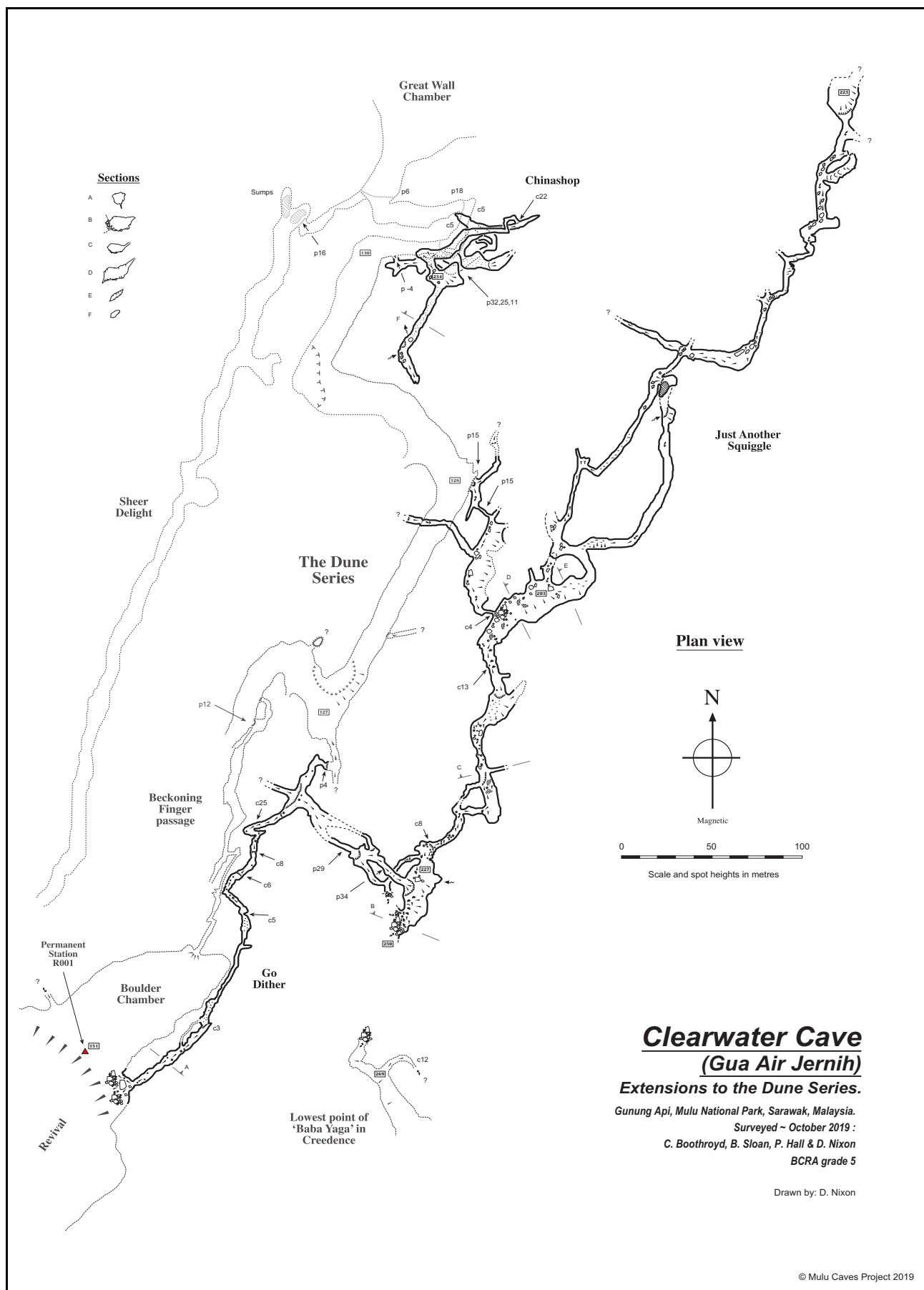
Brendan Sloan in the China Shop

Pete Hall

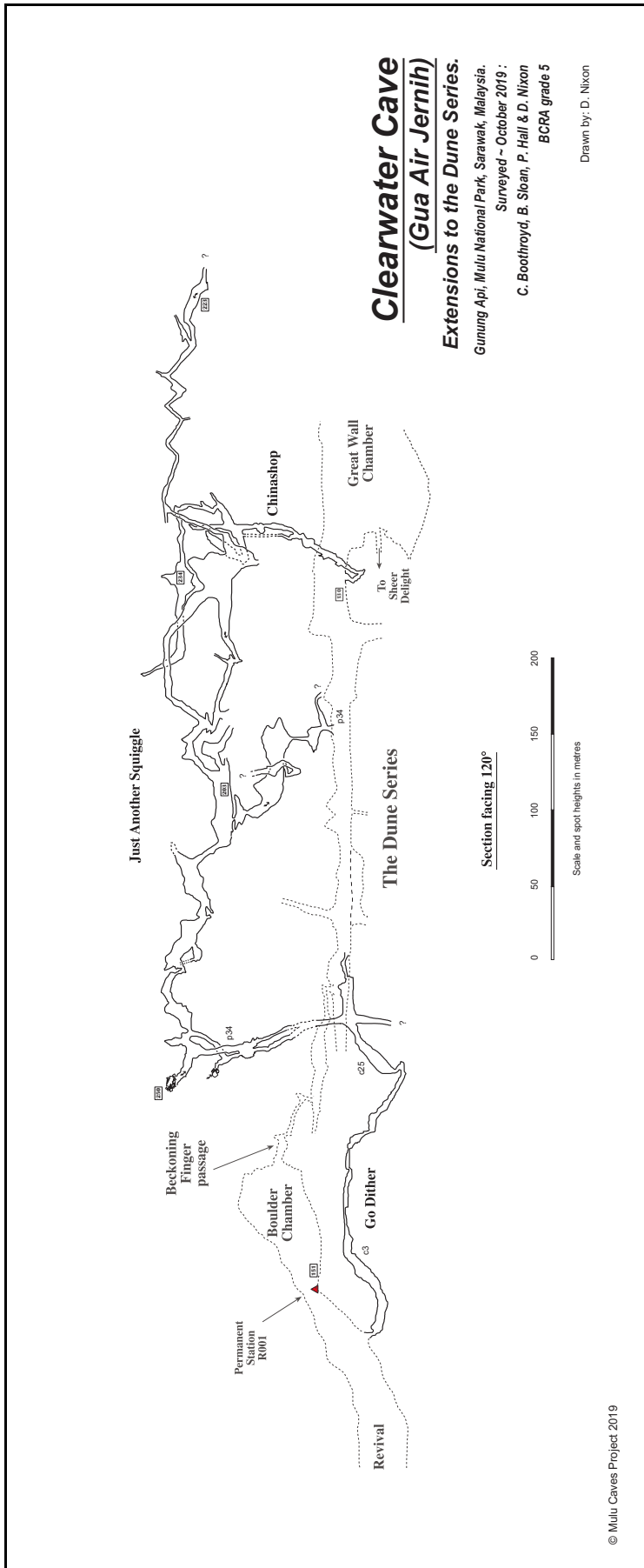


The end of a hard trip; Moose, Colin & Brendan at Snaketrack entrance

Pete Hall



Dune Series discoveries plan



Dune Series discoveries elevation

Exploration in Blackrock Cave

The discoveries in Blackrock Cave were:

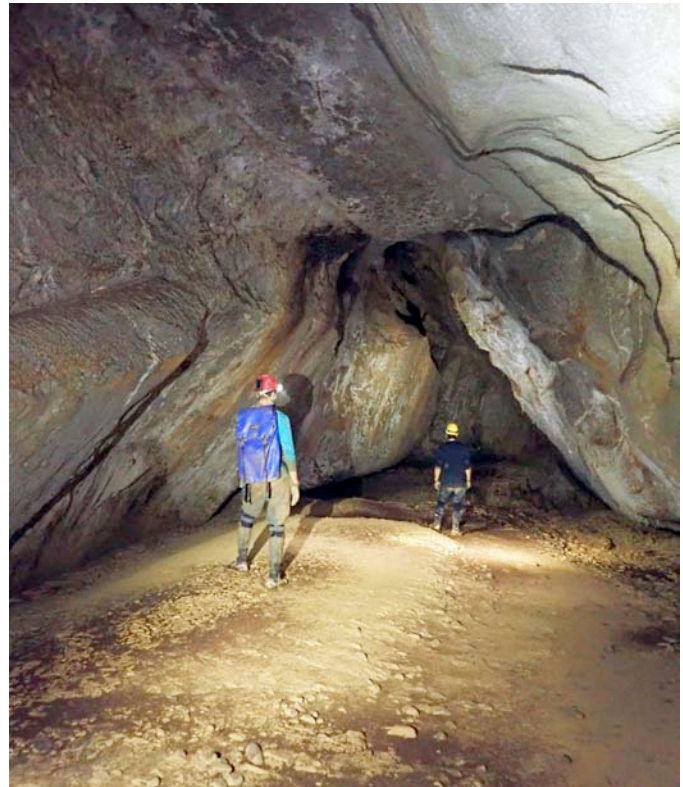
- Ghost Recon
- Blowpipe Ramp Lead

Ghost Recon *length 230.19m - explored 14th October 2019*

Explored by: Helen Fairclough, **Jethro Pryke**, Josh White

A visit was made to the Crinkly Bits in Blackrock, which contained unclimbed leads from the 1988 explorations. The initial climb and pitch described to get into the Crinkly Bits was bypassed by crawling through the bolder choke to the right. One of the ramps at the end of the Crinkly Bits was bolt climbed to a horizontal passage that lead to the top of the other ramp and a passage leading up. This is where footprints started to become visible and the suspicion that other people had been there before came about. The draught went up a 35m aven in a small chamber.

Further down another chamber was found. This chamber had a small side passage where a cairn was found, suggesting that it was there for surveying rather than route finding. Further on a pitch was found with an old bolt with a ring that was of an unknown type and looked like something used in mountaineering in the 70's or 80's.



Shane Warne's, en-route to Blackrock

Frank Pearson

As the explorers wanted answers and suspected that they may have connected a known small cave to Blackrock, this pitch was not descended. Instead a 10m bolt climb next to it was ascended to a ledge where the climb would have continued another 10m but the team was out of bolts. On leaving the cave and looking at historical data, this part of the cave was not known before.

Blowpipe Ramp lead *noticed but not explored 14th October 2019*

Noticed by: Helen Fairclough, **Jethro Pryke**, Josh White

On venturing to the Crinkly Bits from Whiterock, the team went through the Blowpipe and noticed a 10m x 15m ramp up the bed on the east side that looked very promising. It would require a 10-15 m bolt climb followed by a less steep part that may or may not need protection. This was not ascended and is an open lead.

Exploration in Whiterock Cave

The individual discoveries as logged in Survex, in Whiterock Cave were:

- Unbeliever
- Own Goal Waterfall
- I Can't Believe it's not Better
- Strong and Stable
 - Perpetual Extensions
 - Magic Money Tree & Magic Money Tree 2
- Wet Dreams
 - Bird Bath
- Sharp Folly
- Doncaster Virgin
- If the Shoe Fits
- Do you Hear the Cavers Sing?
 - The Off Key Pitch
- Clickbait
 - The Pickle Jar
 - Apisement Chamber
- Unintended Consequences
- Cake Weasel
 - Cheetah Crawl
- Apismal Resurveying
- Ramplitude
- On the Rink
- Shimmering Shower Passage
 - Bit on the Side
 - Rock it Man
 - Rabbit of Negative Euphoria
- Down T Pit
- Big Pit Ramp

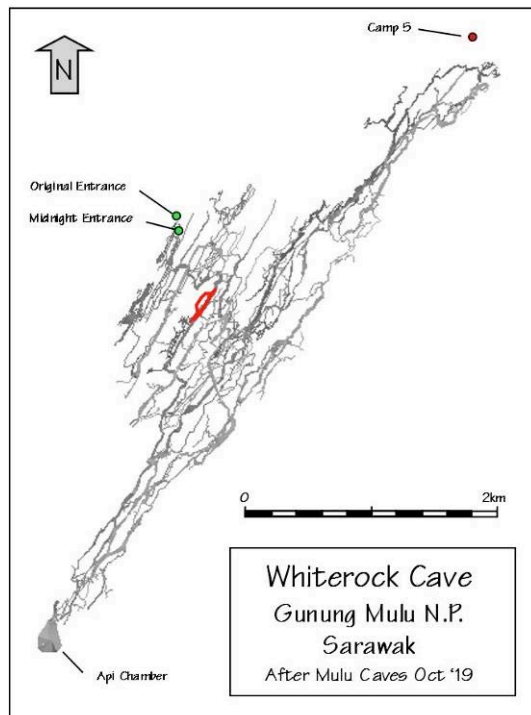


Will in Daydream Believer, Whiterock Cave

Josh White

Unbeliever length 531.1m - explored 9th / 11th October 2019

Explored by Helen Fairclough, **Jethro Pryke**, Tom Smith



Unbeliever was made up of two parts. The first was from a sink hole that was found when walking to Monkey Camp along Daydream Believer. Going down the hole, the passage turns right and continues down a shallow ramp in a similar direction to Daydream Believer. This ends up as a balcony onto Firecracker, about 30m above the streamway. At the other end of the balcony it heads up in a similarly shallow ramp that leads to a small chamber and then to the bottom of a hole back into Daydream Believer; it was not possible to exit the hole without rope.

The second part of Unbeliever is further towards the Africa end of Daydream Believer. It starts with a pitch from some slings that goes into a muddy chamber and then down a boulder ramp that becomes too difficult to descend without a handline.

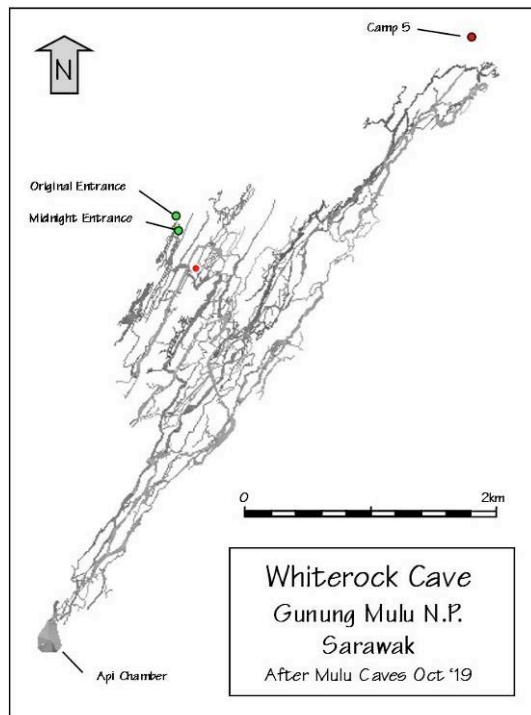


Frank and Will in Africa, near Daydream Believer, Whiterock Cave

Josh White

Own Goal Waterfall length 15.4m - explored 10th October 2019

Explored by: **Frank Pearson**, Josh White, Will Yu-Pearson, Rostam Namaghi



The undescended pitch from Dancing Queen (discovered in 2018) was bolted and descended to Station 12 in Zahara Dessert, a descent of 15m. The initial bolt re-belay had to be re-rigged as a dry descent and trip into Blackrock was transformed into a considerable waterfall after the afternoon deluge on the surface! The trip into the Racer Series in Blackrock takes less than an hour of very pleasant caving from the start of Dancing Queen in the Africa area of Whiterock.

The southern lead in Dancing Queen was investigated but not extended. The passage above Waterfall Junction was followed to an aven that required some bolts though it was in flood at the time. The following day, a trip to the far side of Africa (somewhere near Nigeria) revealed the possible head of the aven in one of the descending tubes on the ramp, also in spate at the time; the survey suggests such a connection.

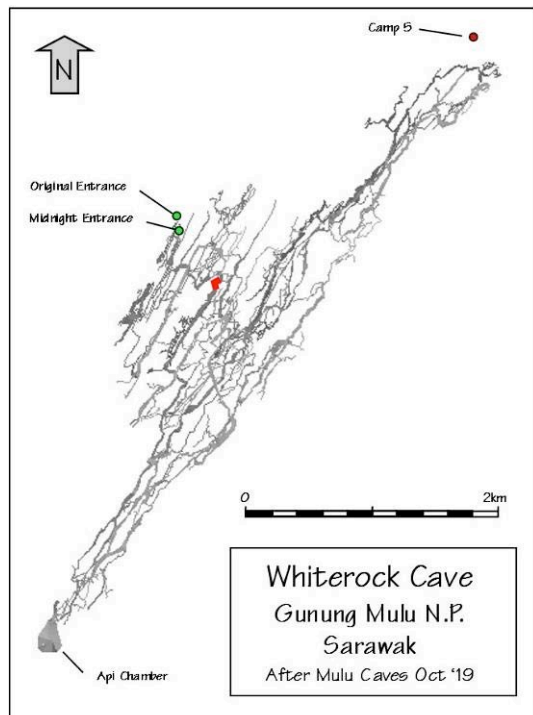
A subsequent trip into the Racer Series in Blackrock to investigate a lead left from its initial exploration revealed the passage to be a shadow cast by a pillar.



Own Goal Waterfall Pitch in Whiterock heading for the connection to Blackrock Cave

Frank Pearson

I Can't Believe it's Not Better *length 116.4m - explored 24th October 2019*
Explored by Jethro Pryke, **Tom Smith**



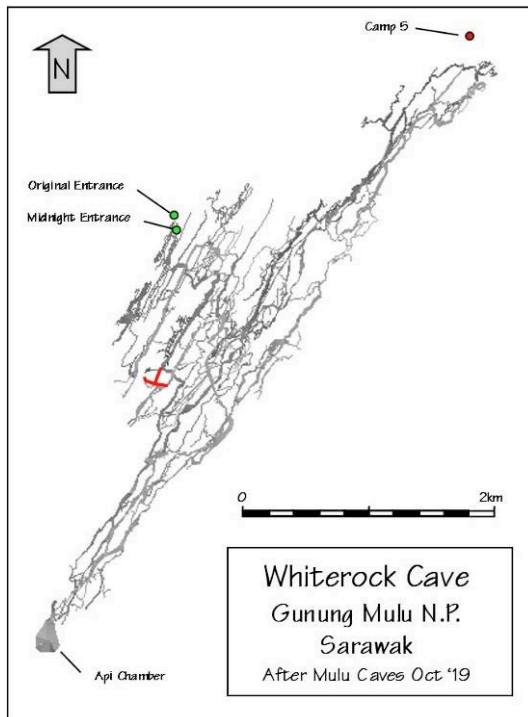
Similar to Unbeliever is a hole in the NW side of Daydream Believer, this time close to the Africa end of the passage. A descending ramp with boulder floor leads to a small chamber with no continuations.



T-Rex in Africa

Frank Pearson

Perpetual Extensions (+ Perp Ext'nal. 2) length 439.13m + 172.29m - explored 11th Oct '19
 Explored by Helen Fairclough, **Jethro Pryke**, Tom Smith



Continuing from the chamber at the top of Strong and Stable, there are two ways on; one heads north and continues down a reverse dip ramp to a flat-out crawl ending in a boulder choke. Before the flat-out crawl there is a window that goes up the ramp and, if it continues, may end up in Api Birthday South.

The other direction out of the small chamber leads up another ramp that meets a calcite flow and a passage up a ramp, but also continues horizontally until a large 8m diameter ramp is intersected, heading down towards Firecracker via Perpetual External 2, but also heading up. Back at the calcite flow ramp, this continues through a stal-filled crawl and breaks out in to a boulder ramp that is presumably (according to survex) the Perpetual External 2 ramp. This continues up and breaks out into Api Birthday South.

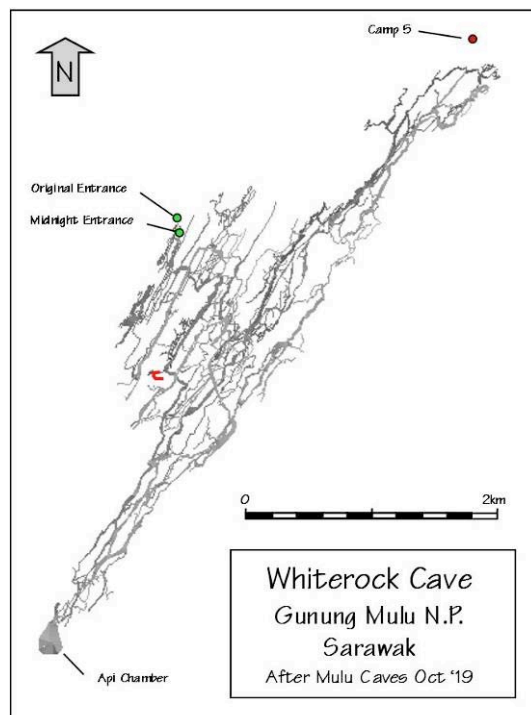


Jethro and Tom in Perpetual Extension

Helen Fairclough

Strong and Stable length 144.63m - explored 10th October 2019

Explored by Helen Fairclough, **Jethro Pryke**, Tom Smith



Half way down the Down Under ramp from Daydream Believer to Firecracker, a passage heading south was noticed and explored. It immediately gets to a calcited mud floor and some stal. The passage heads up a ramp with further ramps heading down back towards Firecracker, one with a lot of water falling from the ceiling.

Continuing up the main ramp it hits a boulder squeeze that opens out to a very loose mud and rock ramp climb, where a hand line is useful. At the top is a small boulder filled chamber that is the start of Perpetual Extensions.

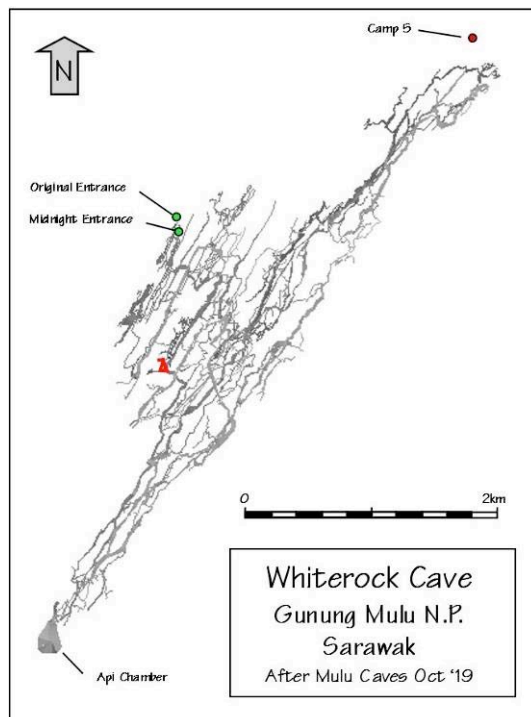


Cracked mud floor in Strong and Stable

Tom Smith

Magic Money Tree & Magic Money Tree 2 length 361.30m - explored 11th October 2019

Explored by **Helen Fairclough**, Jethro Pryke, Tom Smith



From the Down Under ramp (approximately 50m higher than the start of Strong and Stable) two passages lead off northwards, immediately rejoining. This leads to a series of passages lying on the bedding plane, which can be followed for around 100m until an inlet enters. At this point, a tube heading down the bed leads to a window above the Firecracker streamway.

A short distance back from the end of the main ramp of Down Under a short climb up leads to a flat floored section of passage. From here a very straight and muddy stretch leads to a series of ramps and easy short climbs down which slope in the opposite direction to the normal Mulu bedding. The final ramp is choked, but a (roped) climb to a window above allowed access to a further chamber, with a steep boulder slope heading back upwards. A good draft was noticed here, but only on a visit with low water levels.



Helen with the Magic Money Tree

Tom Smith

Perpetual Extensions/Magic Money Tree

Whiterock Cave - Clearwater System

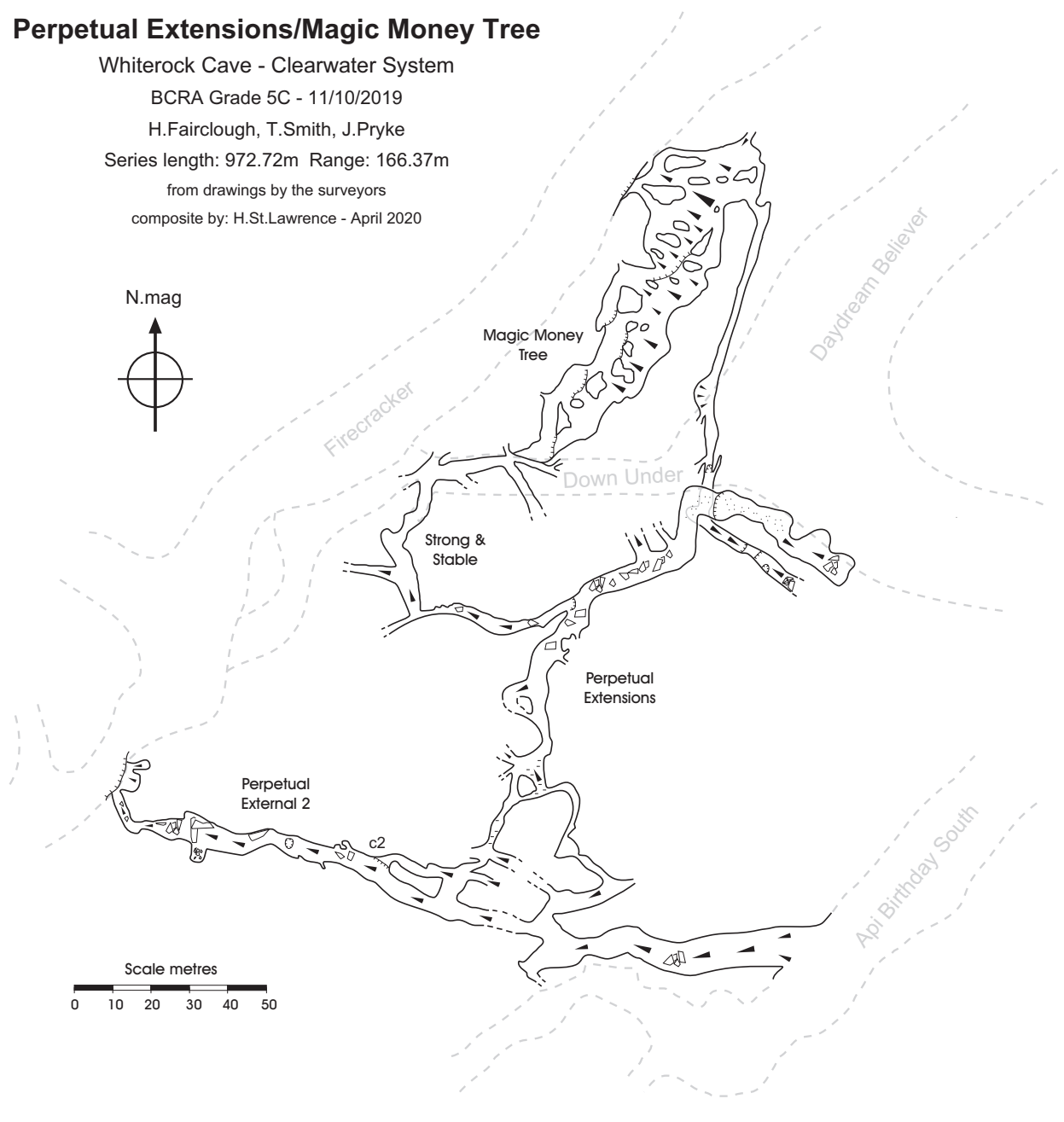
BCRA Grade 5C - 11/10/2019

H.Fairclough, T.Smith, J.Pryke

Series length: 972.72m Range: 166.37m

from drawings by the surveyors

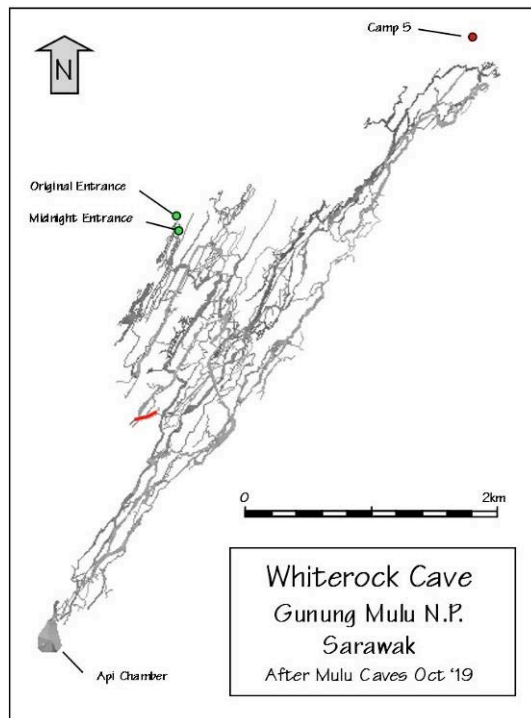
composite by: H.St.Lawrence - April 2020



Perpetual Extensions, Perpetual External, Strong and Stable, Magic Money Tree & Magic Money Tree 2

Wet Dreams length 233.95 m - explored 22nd October 2019

Explored by Helen Fairclough, Rob Middleton, Jethro Pryke, **Tom Smith**

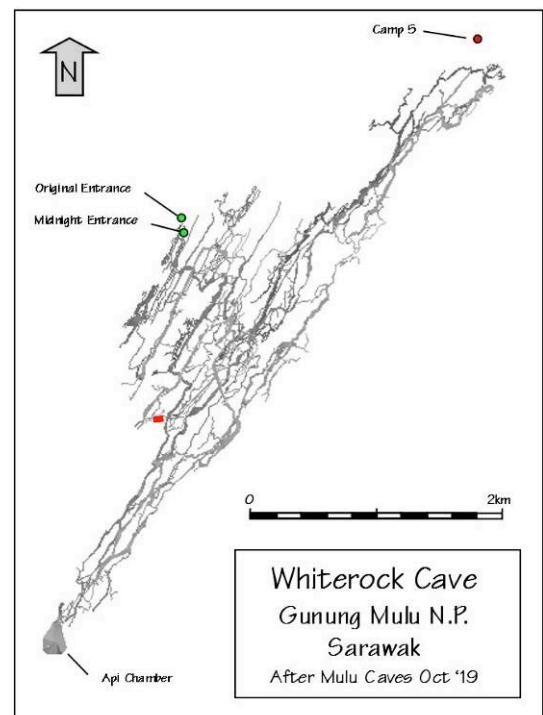


The initial intention had been to look at leads in Technical Underpants. However, the wide-open window opposite the head of the 10m bolt climb was more appealing. This leads to approx.100m of fine passage with good decoration that ends at a pair of windows looking down into Api Birthday South. A small rift pitch was dropped from station 0, about half way along the passage, but was tight and muddy. Although it continues down no further tackle was available and it was deemed not enticing enough to push further.

Bird Bath length 83.96m - explored 22nd October 2019

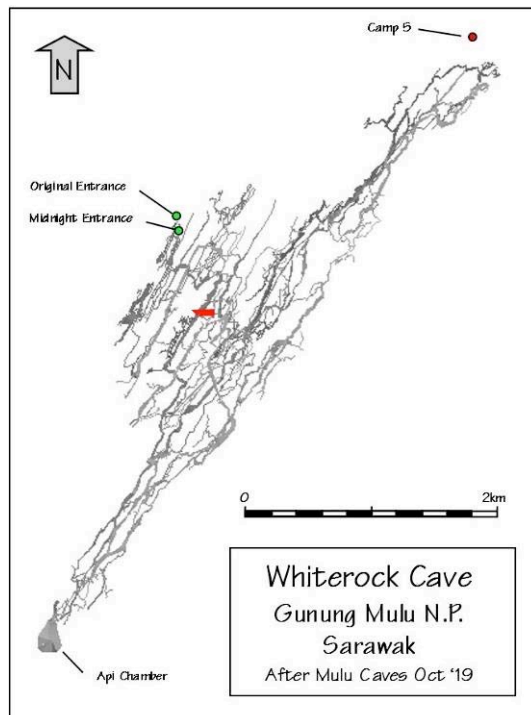
Explored by Rob Middleton, **Tom Smith**

The continuation of Api Dreams passage which ends at the head of a pitch that, from the survey data, looked to be heading towards Phreas a Bird. The 25m pitch lead turned into more like 60m vertically down with two small ledges with connecting side passage. The bottom of the pitch (containing a waterfall at the time) lands right at the end of Phreas a Bird – a survey tie in provided closure over a wide loop of data.



Sharp Folly length 118.72m - explored 9th October 2019

Explored by **Rob Middleton**, Joe Sharp

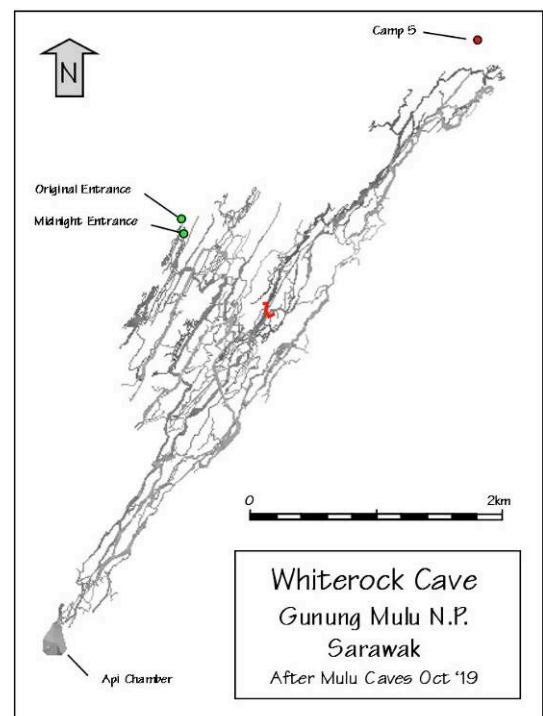


This was a lead close to Propeller Camp, off the Black Joke connection to Blackrock – it was briefly looked at in 2015 but not pushed. An initial squeeze through boulders led to an attractive rift passage for 50m to a 26m pitch. At the base of the pitch were two ways on - a too tight squeeze which draughts, and a body sized rock tube which doesn't.

Doncaster Virgin length 192.34m - explored 10th October 2019

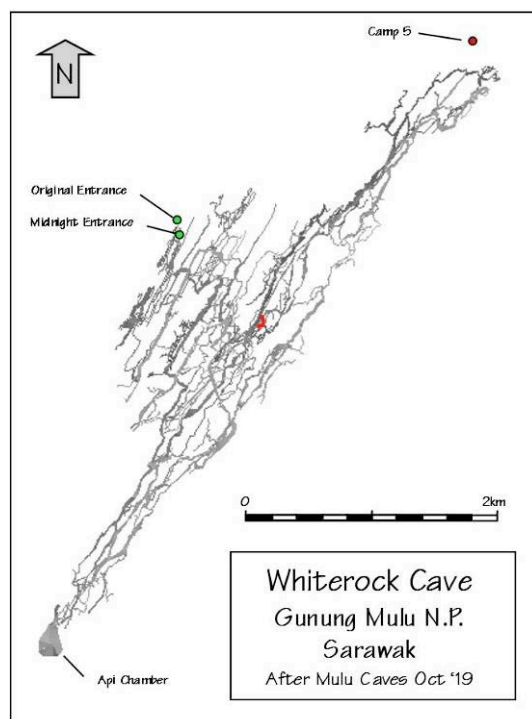
Explored by **Rostam Namaghi**, Rob Middleton, Joe Sharp

A large hole in the floor of Lemon Squeezy (at the Greenwing end of) led to a 45 degree chute roughly 70m in length. This ended in a mud sump that was excavated to a short crawl that opens out into Perfect Mulu Manners. A further hole continuing along the angle of the strike can be immediately found beneath this opening into Perfect Mulu Manners from the excavated sump; though its small size and abundance of boulders makes it a poor lead.



If the Shoe Fits *length 100.47m - explored 10th October 2019*

Explored by **Rob Middleton**, Rostam Namaghi, Joe Sharp

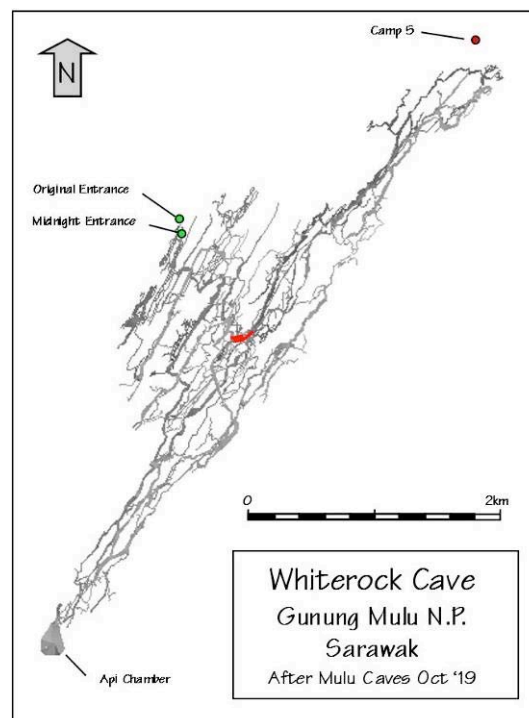


A miserable, soapy bolt-climb above the Northern Line led to a series of small phreatic ramp loops above the Northern Line. Later a free climbing approach was also located. No leads were noted in here.

Do You Hear the Cavers Sing? *length 348.34m - explored 10th October 2019*

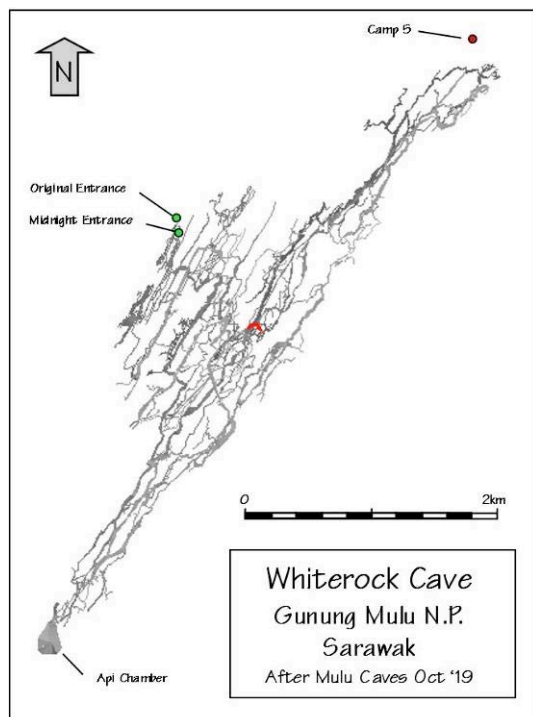
Explored by **Rob Middleton**, Rostam Namaghi, Joe Sharp

A 10m bolt climb off the large left-hand bend in the Green Wing lead to 300m of ramp passages all eventually petering out into mud chokes or small crawls, (with the exception of one heading down towards the Green Wing as a pitch). A further 15m bolt climb part way up led to The Off Key Pitch, and a link back down to Green Wing via Green Feather. See Off Key Pitch for more details.



The Off Key Pitch length 140.53m - explored 23rd October 2019

Explored by Rob Middleton, Pete Hall, **Helen Fairclough**



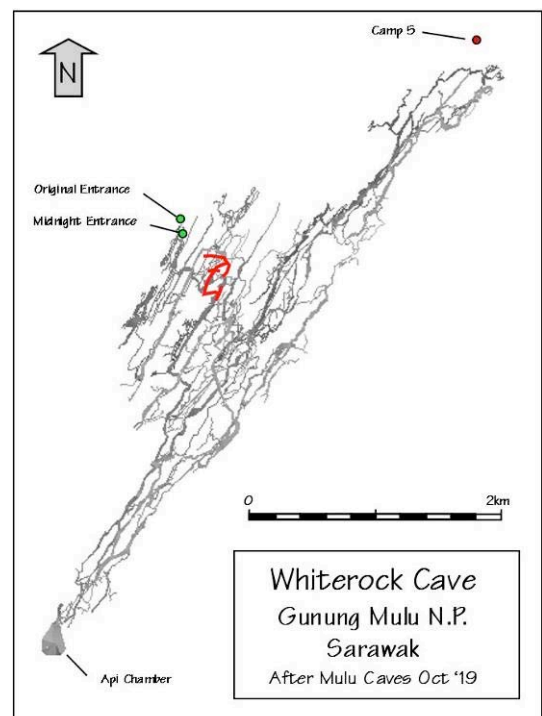
From Do You Hear the Cavers Sing (stn 5) a 12m bolt-climb gained access to a 2m wide rift passage. After around 50m this reached the head of a pitch down into Green Feather. Across the top of the pitch, a further continuation of the passage can be seen; this was not entered and would require a bolted traverse.

Clickbait length 1153.12m - explored 15th October 2019

Explored by Rostam Namaghi, **Frank Pearson**, Will Yu-Pearson, Joe Sharp

The series of passages known collectively as Clickbait Series is made up of individually named passages, some of which appear in survey and some which do not. Where there is a separate survey entry the section is described under its own heading; otherwise passages are described generically under the series name.

At station 12 in Dr Disto's Ramp a passage heads off in the headwall above a 6m climb, protected by a bolt and handline, this is **Clickbait**. A large sandy sweep of a passage rises up to a horizontal development. On the far-right hand wall is a series of narrow honeycomb like tubes rising upwards, which were not climbed to a conclusion. The typically large horizontal Mulu sized passage leads over fallen blocks, debris piles and pits to a prominent T-junction; station 15.



The passage on the left, beyond the blind pit, is **Bleak Expectations**. This is entered by a traverse by the side of a rift / shaft. This shaft runs under the upper passage just entered and is

crossed by many bridged boulders. The passage is followed over a number of boulder piles to a large aven with many jammed boulders in the slumped floor down through which falling water could be heard. The survey places this above the northern end of Zahara Dessert. In the roof of the chamber an un-ascended climb of 8m, requiring ropes and protection, leads to a possible small continuation of the passage.

Right at station 15 junction leads via a sandy bridge and further boulder hopping along a meandering passage to a steep boulder choke. An easy climb and short squeeze under a boulder leads to an impressive chamber in Last of the Summer Wine.

In this chamber a cairn was located and used to tie in the Clickbait survey, (Upper2 station 61).



Cheesmauler's Passage

Frank Pearson

In the west wall of the chamber, just before and below the slope down to Dr.Disto's passage, is a low overhang. A prickly route down through boulders leads to a small aven with a passage at the top of a short climb leading out of the far wall. At the top of the climb is a sandy passage. This is **Cheesmauler's Passage**. Here, another honeycomb like series of small tubes breaks through the left wall. These were not followed down to a conclusion, though the survey suggests they are directly above the similar rising tubes at the start of Clickbait. The continuing Cheesmauler's Passage is followed through more spacious, meandering, sand and cobble strewn passages, via several pit traverses, to a prominent cross junction.

To the left is a ramp ascending to an unclimbed 25m aven in **Chicken of the Woods Chamber**. Down to the right a descending ramp leads to a pitch into **Apisement Chamber**. Directly ahead

at the cross-junction is **Escape to Victory** which leads to a large ramp descending to another pitch into the **Pickle Jar** (described later).



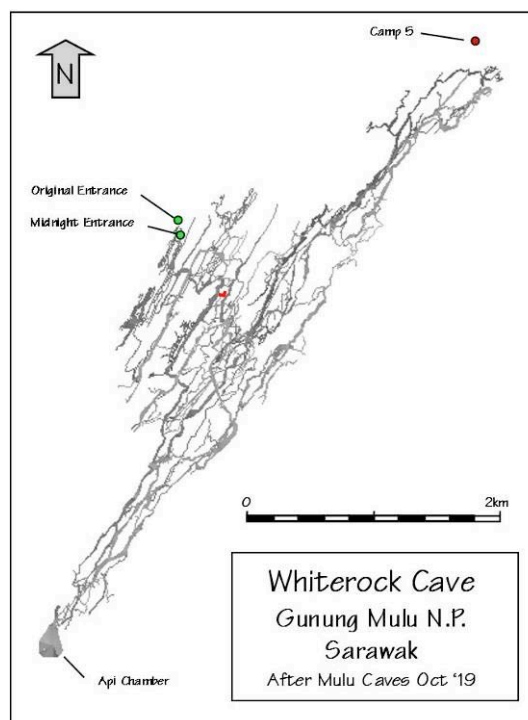
The Clickbait team in Cheesmauler's Passage

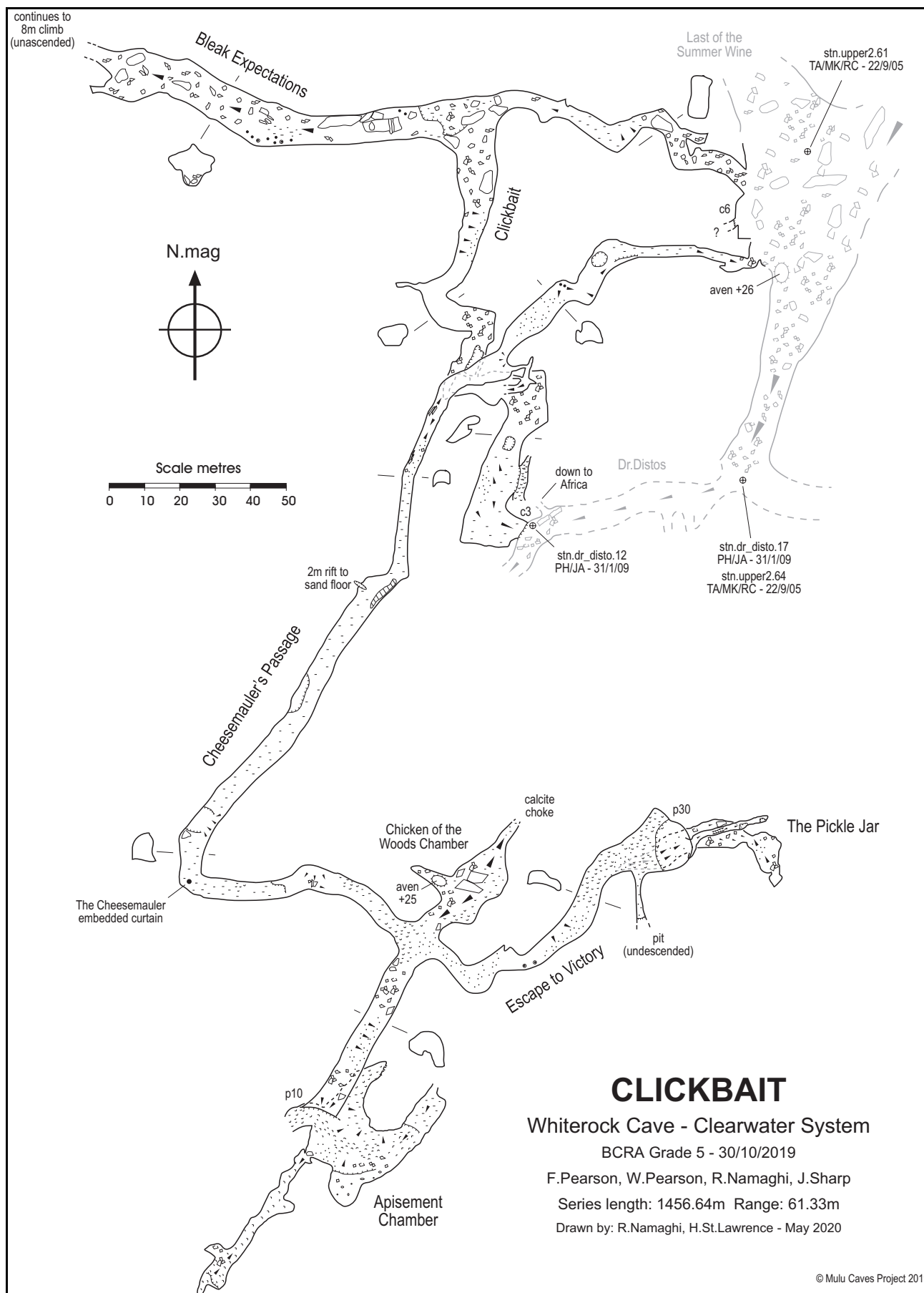
Frank Pearson

The Pickle Jar *length 134.22m - explored 23rd October 2019*

Explored by **Rostam Namaghi**, Brendan Sloan, Tom Smith, Jethro Pryke

This is an extension of the Clickbait/Cheesmauler's Passage, descending the pitch at the end of the Escape to Victory ramp. Though Survox shows the foot of the pitch to be only 20m from Api Birthday North, the large 20m diameter passage leading that way was completely choked with mud. The passage in the other direction led to another choke after 70m.

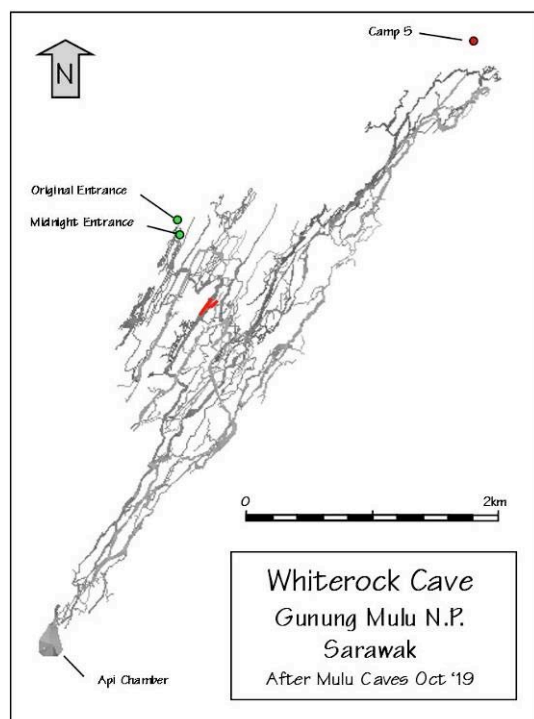




Clickbait – The Pickle Jar – Apisement Chamber

Apisement Chamber length 169.30m - explored 23rd October 2019

Explored by Rostam Namaghi, Brendan Sloan, Tom Smith, Jethro Pryke



This 60m long chamber is approached from a large balcony near the crossroads at Cheesmauler's. The approach slope on the left-hand wall is composed of dry sand and loose rock and once gardening begins, it continues for some time. Two short rebelay's were added, continuing round left out of the fall zone until you rest upon a natural bridge in the chamber. A large 4m wide aven can be seen at this side of the chamber.

A sandy ramp can be descended to a narrow rift – this can be dropped to bring you into the main chamber without the threat of rock fall. At the bottom a steep ramp heads off to the far side of the chamber (the right-hand wall when you initially approached) and a sandy chamber ends in a series of boulder chokes with not much draught. It should be noted that much of the debris in the chamber had chunks of the vivid brick red clay often seen at this end of the system.

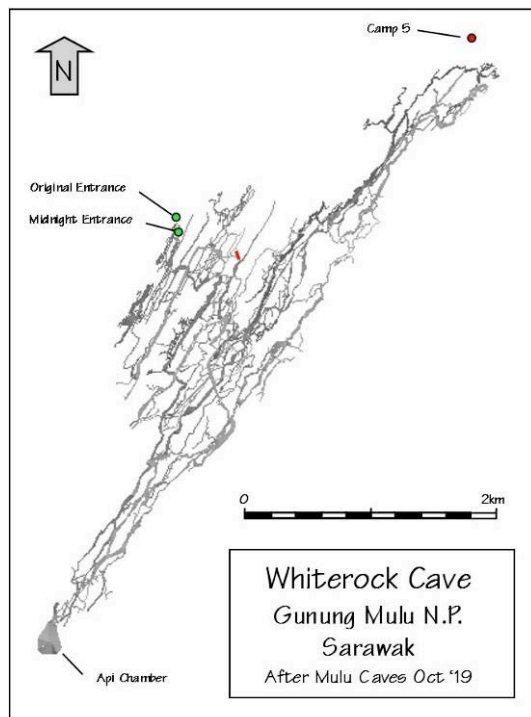


Cheesmauler's Passage

Frank Pearson

Unintended Consequences length 96.25m - explored 24th October 2019

Explored by **Tom Smith**, Jethro Pryke



A ramp lead in the upper part of Out of Africa was investigated as a potential route to the 4th horizon.

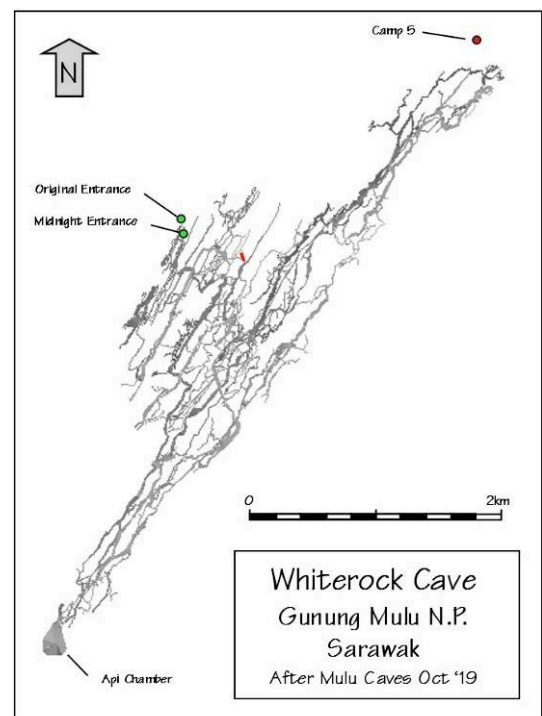
When this was first discovered in 2005 the lead at the top of this ramp was the highest point in Whiterock. Exploration at that time was halted at a tight squeeze through needle sharp calcite with little or no draught detected. With big passages heading off south the lead was left for another day

Passing the tight, sharp constriction, where previous exploration had stopped, led after 60m to a boulder / calcite choke at a similar level to most of the ramps explored in 2017. This is around the level where the 4th horizon should be.

Cake Weasel length 167.01m - explored 24th October 2019

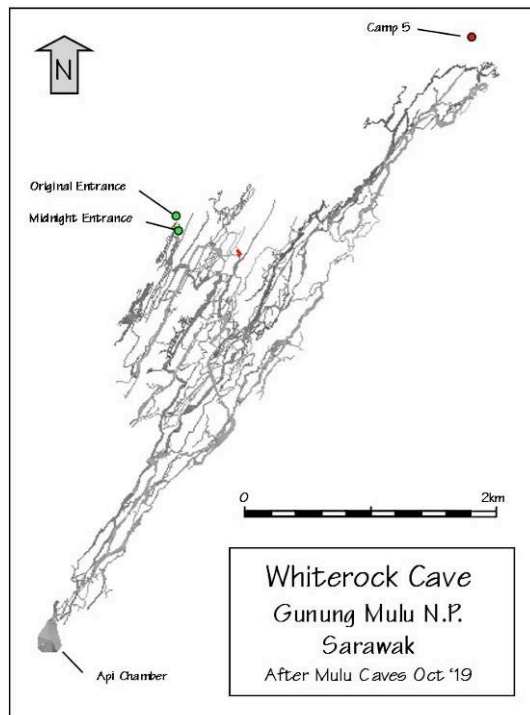
Explored by **Rostam Namaghi**, Brendan Sloan

Two parallel avens approximately 12m tall meet in a rift in the roof which quickly narrows to a crawl. From here a series of small chambers can be entered with the strike very evident – descending tubes on the left and ascending ones on the right. The last chamber has a large guano slide descending 10m. This brings you to a three-way fork, with the rightmost taking you to a pitch into Black Joke, the centre taking you suspiciously close to the presumed wall of Black Joke (the wall is a mud choke) at what would be floor level. The left takes you on a series of winding crawls which either end in tight muddy chokes or in a dripping calcited chamber.



Cheetah Crawl length 132.32m - explored 24th October 2019

Explored by **Brendan Sloan**



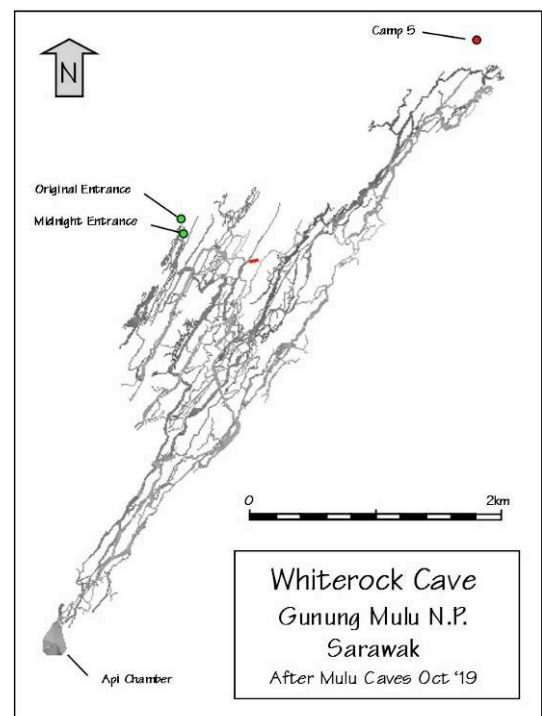
A series of small passages accessed via a crawl at the beginning of Ancestor's passage, next to Cake Weasel. After entering the lower level, a short climb up and an easy traverse gives access to a window looking back out into Ancestors. Heading in the opposite direction from the climb leads to a series of small chambers descending along the strike. These terminate in a slightly draughting upwards rift that would need some gear to climb. However, the proximity to known passage means it is most likely to connect in the Black Joke area.

This data was originally entered into SurveX as BS24a.

Apismal Resurveying length 43.7m - explored 24th October 2019

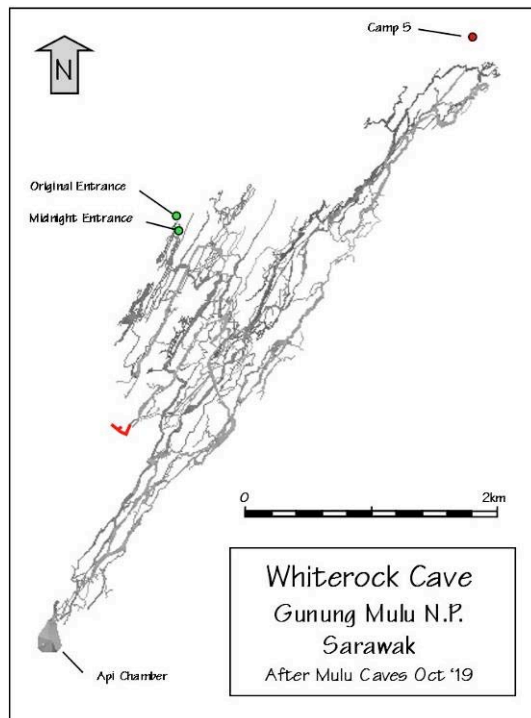
Explored by **Rostam Namaghi**

A series of small openings just off the very beginning of Ancestor's passage (Propeller end) that go up the strike and create multiple entrances. The lead splits into two with the right going to a calcited pool and the left fragmenting into multiple small passages and fills with boulders.



On the Rink length 287.35m - explored 22nd October 2019

Explored by **Helen Fairclough**, Jethro Pryke



From the end of Api Ending, the left-hand branch is a muddy inclined bedding plane of around 0.5m height for 20m to the head of a descending ramp of larger proportions. Above the ramp appears choked with boulders and a draught was evident, although close inspection was not possible. A small continuation opposite leads to tight awkward climbs with little draught.

Down the main ramp (handline required) a complex series of phreatic ramps is entered, these can be followed downwards to a mud sump, and some minor side passages. However, the main draught appears to lead up a ramp adjacent to the base of the handline. This leads to the head of two downwards pitches with an upwards continuation of the ramp also visible on the opposite side. These were not entered, and ropes and bolts would be required. This point appears to lie further south than the choked southern end of Api Birthday.

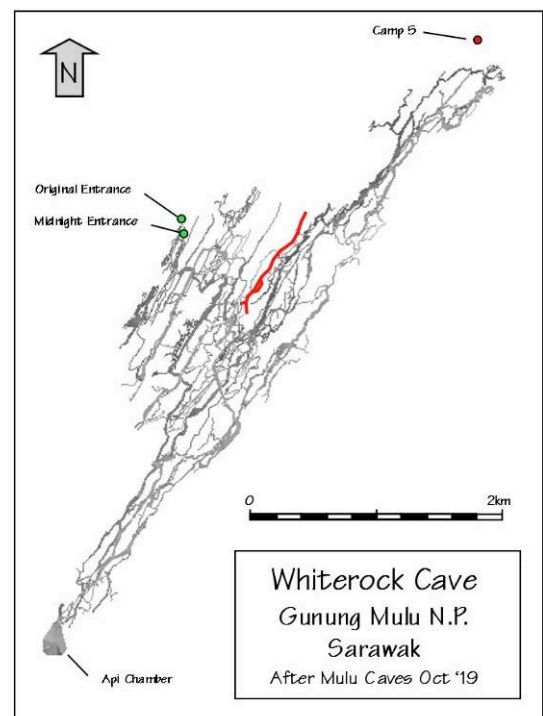
Shimmering Shower Passage length 1605.79m - explored 24th / 25th October 2019

Explored by **Rob Middleton**, Pete Hall, Helen Fairclough, Jethro Pryke, Tom Smith

A major discovery of the expedition. This series totals over 1.7km, with 1.3km of proper Mulu trunk passage.

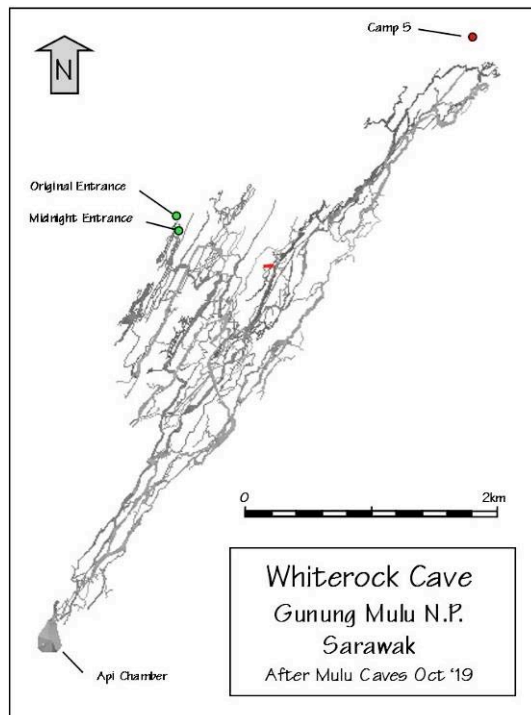
A descent down a 15m pitch from a descending ramp in the Medusa Series (Station 2.4 - 45m rope) leads to an impressive canyon passage heading both North and South. South leads to over 500m of spectacular passage ending in a mud choke not far from the Green Wing. A number of leads off this were pushed including a large and impressive 100m oxbow, and a couple of smaller passages ending in chokes. One more high-level lead remains.

North quickly offers the side passage of **A Bit on the Side** (see below), while the main passage continues in spectacular vadose canyon style. After 200m the passage opens into a large boulder-filled area and a rising ledge back left leads to **the Rabbit of Negative Euphoria** (see below), while the main passage continues in fine style past a number of wet sections before a long section of impressive flowstone and gour filled passage eventually forces the passage shut after 0.8km.



Bit on the Side length 40.0m - explored 25th October 2019

Explored by **Rob Middleton**, Pete Hall, Helen Fairclough, Jethro Pryke, Tom Smith



From station 10a in Shimmering Showers a 1.5m x 3m passage leads off on the east side. This turns north, parallel to the main passage and descends through a gour pool and down a ramp to where it passes under two water inlets, which can be very wet.

There is a continuation of around 1.5m diameter passage above head-height past the second inlet which has not been explored.



Shimmering Showers near the base of the pitch down from Dirty Little Secrets

Helen Fairclough

SHIMMERING SHOWERS

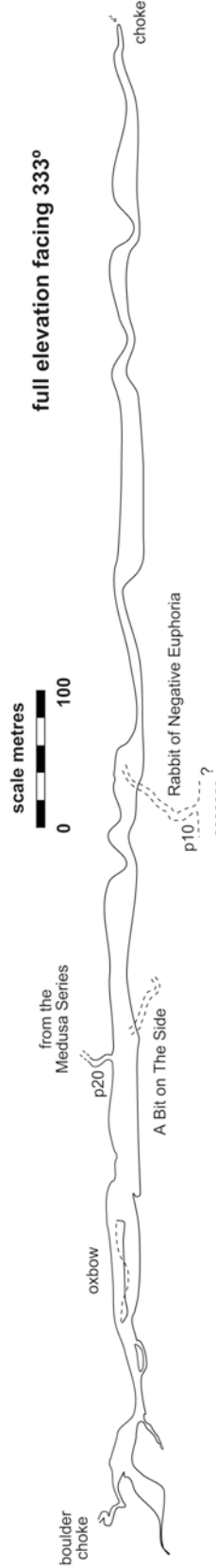
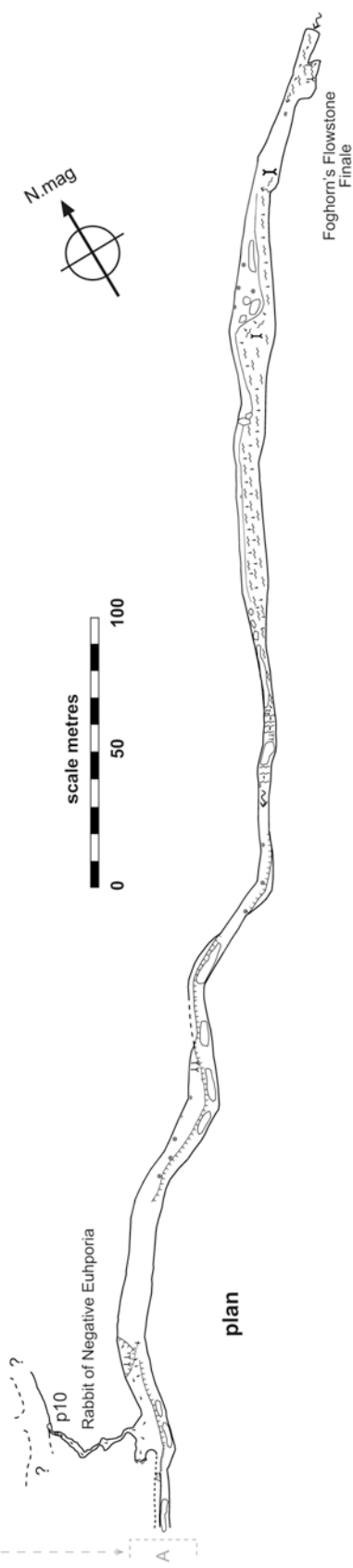
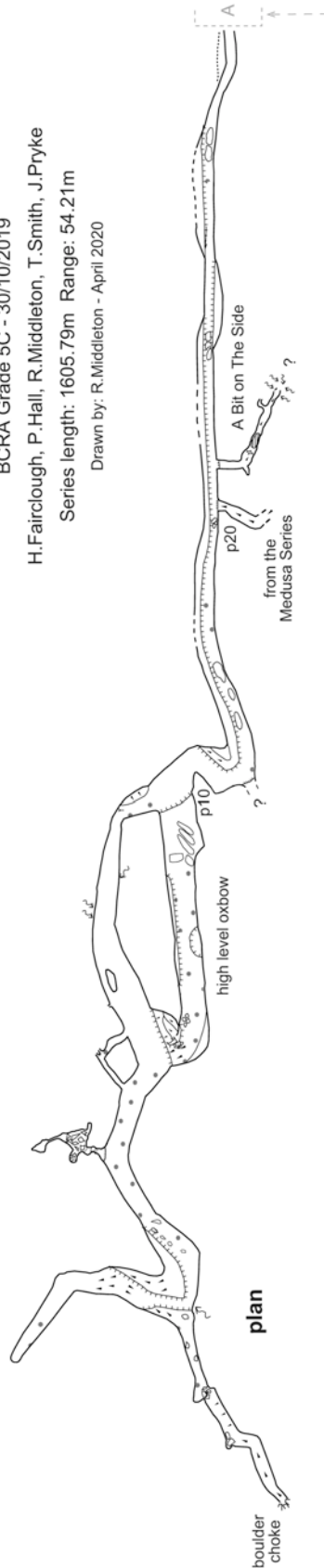
Whiterock Cave - Clearwater System

BCRA Grade 5C - 30/10/2019

H.Fairclough, P.Hall, R.Middleton, T.Smith, J.Pryke

Series length: 1605.79m Range: 54.21m

Drawn by: R.Middleton - April 2020

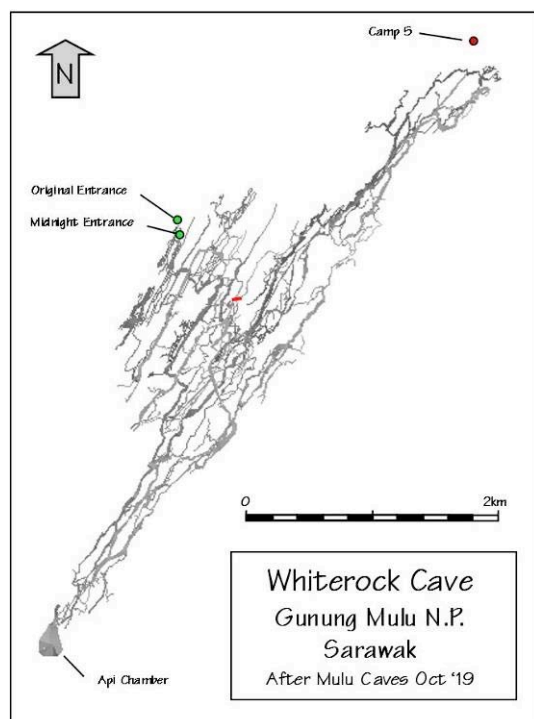


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Shimmering Showers – Bit on the Side – Rock it Man – Rabbit of Negative Euphoria

Rock it Man length 32.93m - explored 25th October 2019

Explored by Jethro Pryke, **Tom Smith**



A short descending ramp entered through a gap between the wall and a boulder jammed in the passage enters into a small chamber with gypsum crystal formations. The downwards continuation is too tight.

This data was originally entered into Survex as Baby Shark.

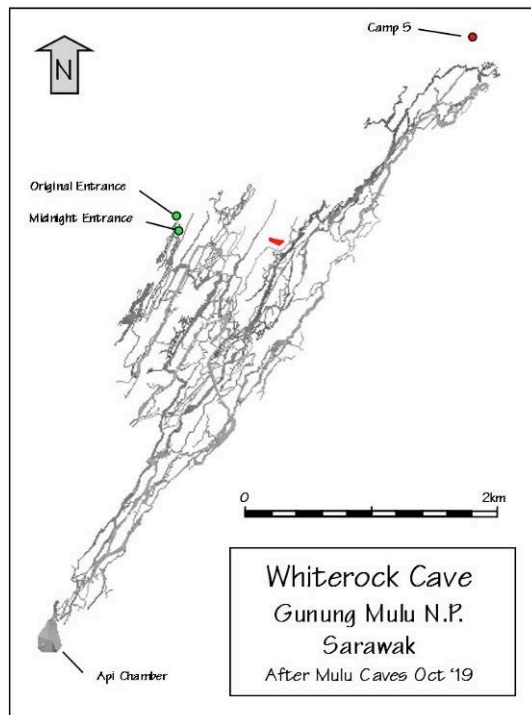


Chums Bypass in Shimmering Showers

Helen Fairclough

Rabbit of Negative Euphoria *length 83.27m - explored 25th October 2019*)

Explored by Jethro Pryke, **Tom Smith**



Off the north end of Shimmering Showers Passage, a descending ramp takes off from a ledge on the west wall and continues down in relatively small proportions with a couple of awkward climbs on mud with a thin veneer of calcite.

There was a noticeable downward draught present and after reaching around 40m below the level of Shimmering Showers a ledge was reached looking down into sizable passage. Unfortunately, there was no reasonable natural belay for the estimated 10m pitch, only some solid looking rock needing a drill and bolt.

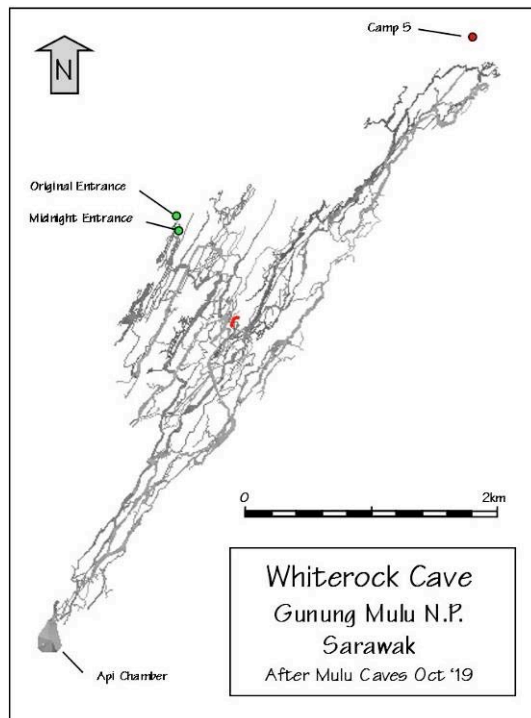


Pitch into Shimmering Showers from Dirty Little Secrets/Medusa series

Helen Fairclough

Down T Pit length 134.29m - explored 23rd October 2019

Explored by Rob Middleton, **Pete Hall**, Helen Fairclough



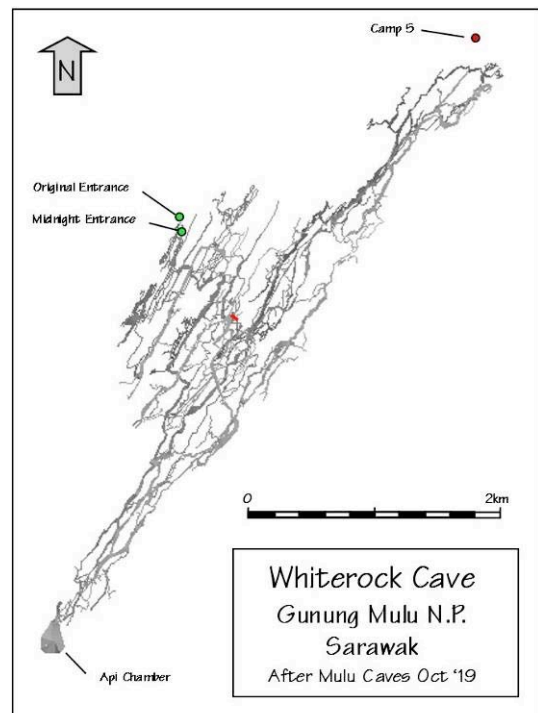
From the foot of the large pit at the beginning of the Green Wing from the Propeller Camp side, is a tricky back and foot boulder traverse that is difficult to spot. It is a blind pit, no way on.

Big Pit Ramp length 54.54m - explored 28th October 2019

Explored by **Pete Hall**

The ramp leads off the large pit at the beginning of the Green Wing from the Propeller Camp, unfortunately not as far as it first appears.

This data was originally entered into Survox as Baby Shark.



EXPLORATION IN GUNUNG BENARAT

Exploration in Hurricane Hole

The discoveries in Hurricane Hole were:

- Mother of All Voids Climb 1 & Climb 2
- Treading Water
- Pitch Please



The uninspiring entrance to Hurricane Hole

Rob Middleton

The Mother of All Voids Climbs 1 & 2 *length 112.68m - explored 14th - 18th October 2019*

Explored by Helen Fairclough, **Rob Middleton**, Jethro Pryke, Joe Sharp, Tom Smith

The Mother of all Voids is a huge unclimbed shaft within Hurricane Hole on the eastern edge of the Benarat cliff, as seen from Camp 5. First explored in 2003 with a further push in 2009, it has a high point at a prominent window overlooking the lower shaft at 80m. The team ferried equipment through the tight crawl near the entrance and re-bolted the original climb to the window. From this point they ascended the shaft. The bolt climb ascends the east wall passing what appear to be good ledges; these are, however, non-existent. The climb is 100m beyond the window to a stalagmite boss 10m below the roof. The shaft is 60m in diameter with the final stance level with Hole of the Moon Cave at the top of the Benarat cliff. High in the domed roof above the stance is a draughting passage approximately 50m away, though it was estimated that 100m of rope would be required to reach it. The team had run out of bolts and could not access this passage; it remains a possible lead in one of the most spectacular sites in Mulu.

Treading Water *length 50.96m - explored 16th October*

Explored by **Helen Fairclough**, Jethro Pryke

At the top of the Magician's Elevator, a climb up over calcite leads to a small, well decorated chamber. At the west side of the chamber is a 5m handline climb down to a ledge above a small pool in a rift. The far side of the pool has a vertical face, however, the rift appears to close down immediately beyond this. At the east side of the chamber, an upward ramp also appears to be choked, however, rope would be required to reach that point.

Pitch Please *length 108.78m - explored 18th October*

Explored by **Helen Fairclough**, Jethro Pryke, Rob Middleton, Tom Smith

At the base of the Magician's Elevator, a descending calcite ramp was explored. This followed a lovely ramp down, eventually descending through calcited boulders to emerge on a ledge high above Homeward Bound in Benarat Caverns.



Pitch Please

Tom Smith

Medical Report

Rostam Namaghi

The Medical Officer for the Expedition was Dr Rostam Namaghi (GMC 7409905). I covered Camp 5 operations, with Dr Brendan Sloan (GMC 6118813) covering the Clearwater activity.

Preparation was straightforward. Drugs needed were prescribed by RN and BS and taken out from the UK. Penicillin allergies and chronic medical conditions were taken account of with additional drugs prescribed. Information was available in the event of an emergency in the form of hard copies, along with NOK details and Insurance policies and contact numbers.

All in all fewer than 4 man days were lost to illness. This was due to a variety of minor causes and is well below the expected number for an expedition of this duration. 2 courses of antibiotics were prescribed for cellullitic conditions, some pain relief (Co-codamol) was given, and foreign bodies were removed from team members hands, feet and eyes (one being part of a fragmented contact lens – the user seems to think this may have been due to contamination with deet). Most of the medical activity on this trip however was concerned with treating tourists, with expertise provided for:

1. A man with a deep leg wound (cleaned and sutured by RN) sustained following a fall caused by deterioration of an underlying neurological condition. Antibiotics and comprehensive medical advice were given, and the park made aware by the radio of the situation. Fortunately, the repair was good enough to be able to walk to the boat and out of the park and prevented a more complicated extraction from Camp 5.
2. A lady fell over on the path and sustained an unfavourable laceration across Langer's lines (of skin tension) above her right eyebrow. This was sutured (RN & BS) under local anaesthetic to a good cosmetic result. Advice was given regarding follow up and likely outcomes.
3. A lady slipped and twisted her left ankle – she was examined (BS) and given advice. As she continued to weight bear and the limb was neurovascularly intact no further action was taken.



The doctor treats a patient

Rob Middleton

Equipment Report

Rob Middleton

The Camp 5 2019 expedition prioritised light weight and safety for its equipment choices. Light weight equipment was useful as all equipment had to be carried in porter loads to camp 5, and once at Camp 5 many of the leads were deep towards the far end of the systems.

Safety must also be a high priority as the difficulty of a rescue from deep within these systems cannot be overstated. With this in mind a Sked stretcher was taken to camp 5, together with a collection of hauling gear including two newly purchased Petzl Rigs descenders, which could be used to haul a stretch and jockey simultaneously should the worse occur. These descenders were a very welcome addition to the Mulu Caves Project rescue kit and should prove invaluable for many years to come. *We also had substantial first aid provision for any such eventualities. (See medical report)*

In addition to the rescue kit above, all expedition members were also advised/instructed to carry a pulley jammer type device (e.g. Petzl Microtraxion) to enable self-rescue 'just in case'. Thankfully none of this equipment was required but it is very much better to be looking at it than for it.

The project to bolt climb the 'Mother of all Voids' in Hurricane Hole was to be fairly equipment heavy. Over 500m of static rope was taken through the rather constricted entrance, together with a dynamic rope for bolt climbing, drill and lots of batteries, over 200 bolts, over 50 hangers and krabs/maillons etc. Simultaneously other teams would be working in Whiterock also picking off a collection of equipment heavy leads bolting climbing leads. For this reason, it was decided to take 1200m of rope to camp 5. This was a combination of as much 9mm as possible (due to its reduced weight) and some 10.5mm for heavier use or leaving nearer the entrances. Much of the 9mm was acquired from previous expedition sponsorship by Spanset and can be highly recommended for vertical caving, be light, strong and handling well. The 10.5mm was also from Spanset but did not seem to have aged so well becoming stiff and hard to handle over time. It was still however perfectly strong and useable.

Zinc plated 8mm throughbolts were used primarily for anchors, with Fischer being preferred as their bolts are both fairly cheap and tested and rated to reasonable strengths (+6kn in all configurations), though some other brands were used as leftovers from the store. *Please can future expeditions only buy rated throughbolts from either Fischer or Hilti, unbranded ones are just too much of an unknown.* Some insitu HKDs were also used in Hurricane Hole, though it should be noted that HKDs are much more reliant on the strength of the surface 25mm of the rock than throughbolts and are more prone to user error.

Petzl 8mm alloy hangers were used as standard, with a number being left behind out of necessity as many leads were bolt climbs and required pulling through when the job was done. Likewise, many 7mm long galv maillons were left behind for the same purpose and it is recommended maillons always form a large proportion of the rigging gear for this reason. Stainless hangers, bolts and maillons were acquired by the expedition should any fixed rigging be needed, though these were never actually placed as what few ropes there are on the trade routes in Whiterock were already rigged with stainless gear.

A combination of karabiners, maillons and slings were used by the expedition, primarily Petzl and Lyon, with Safety Aloft Ltd. very kindly offering the expedition preferential rates on equipment purchases for any extras needed.

Makita 18v SDS drills were used throughout, with new 5ah batteries proving a wise if costly investment particularly for bolt climbing with 40+ bolts a battery possible. 2 new 5ah batteries were purchased for the expedition, and it recommended that future expeditions continue to replace a proportion of the battery stock each time as cells are known to degrade with time. Upon arriving in the park, one battery was found to be defunct proving the point. Petzl Tam Tam bolting hammers were used as standard.

Aid climbing was carried out using dynamic rope and Grigris for belaying, with 5 step etriers used as standard. Most aid climbing was done using bolts, but skyhooks, and slings were often also found to be useful. One team member experimented with the Petzl Evolv Adjust double lanyard for clipping in moving up while bolt climbing. This was found to be an excellent piece of kit allowing very slick and efficient progression. In fact, so much so that on one occasion the operative managed to aid-climb over 70m vertically in just half a day!

Most members opted for Scurions as main lighting source, with the long duration batteries ensuring only 2 were needed for a 4-day camp. One member used a Petzl Ultra Wide, which also performed well, but required many more batteries for an underground camp. Fenix head torches were used by many for backup lighting, while a number of members choose to carry an AA based spare in case the Lithium Ion batteries of Scurion, Ultra, 18650 etc. were to be removed at security in the airport. With new security protocols this is a very real risk for caving expeditions, though this time all members survived unscathed.

As with previous trips, a collection of walking boots, 5.10 Canyoneers and classic Wellington boots were all used by members, with most people being fairly happy with their choice. Two members also tested out canyoneering boots made by Bestard, which though expensive, proved to be supportive, grippy and fairly durable by Mulu standards and are highly recommended.

Clothing was typically either Ron Hills or Lycra with full-body but lightweight covering recommended both to keep jungle nasties at bay, and to avoid too many scratches underground, which easily become infected. A 1 season sleeping bag was recommended for underground camp with liners proving just a little chilly.

Cooking was provided with Kovea Spider stoves which were both reliable and powerful, and had adapters fitted to work with local gas, as the typical European screw thread types are not available in Malaysia. MSR pan sets were used, which were solid and reliable.

A very well planned and successful expedition gear wise, with a big thanks to Safety Aloft Ltd. for their sponsorship, and to Mulu Park HQ for allowing us to store most of our gear securely in Mulu.

Financial Report

Helen Fairclough

As both co leaders and the treasurer were new to their roles for this trip, budgeting was always going to prove challenging. This was not helped by the last minute cancellation by four members. The following is designed to help assist others in planning for a future situation. Overall, the expedition ran approximately to budget, and it was even possible to provide a small rebate to expedition members.

Income

As different members of the expedition were present for different lengths of time, members paid a fee which incorporated both a flat fee and a daily fee. This aimed to balance between the fixed costs of the expedition (e.g. equipment, transport/porterage) and those which were proportional to the number of person-nights (e.g. food, accommodation). However it was not designed to be a direct correlation, in order to account for the additional setting up and packing away done by members who were present for the entire duration. An initial payment of £200 per member was collected to confirm attendance, and allow for purchases of equipment. The remaining expedition fees consisted of £14 per day paid by bank transfer before departure and £300 in ringgit cash, on arrival. This led to total costs per person of between £682 and £906, depending on individual duration.

The expedition received additional funding from the Ghar Parau foundation, which we are very grateful for. Retrospectively, a contribution from the central Mulu caves project was also received, as several items of long-term equipment were purchased (rescue and survey equipment). Finally, the Benarat 2020 team shared the generator and fridge (these were kept at camp 5 in between the trips), and contributed half of their cost.

Personal Contributions	£11332
Ghar Parau	£500
Mulu Caves Project	£876
Benarat 2020	£125
Total	£12833

Expenditure

Overall, the expedition's total costs were fairly close to the initial budget, however, the breakdown was substantially different to expected. Staff costs were considerably reduced, as the reduced team size meant there was no need for both a chef and a chef's assistant. Cost of food was also less than expected. However, some additional logistical costs had not been initially considered, particularly the costs of transporting the food to Mulu HQ, and various small costs, such as petrol for the generator, gas for camping stove etc. Porter costs were also higher than expected, many of these were for resupplies part way through the trip. Additionally, most equipment purchases had been completed based on the initial, larger team size, increasing the per-person cost.

After the final accounts were completed, refunds were offered of £50 per member of the expedition, and £100 for people who had paid the initial contribution and then not attended.

Category	Budgeted	Final			Subtotal
		RM, cash	RM, card	GBP	
Food	£3100	4216RM	4600RM(HQ) + 3486RM(Miri)		*£2460
Accommodation	8838RM		6405RM		*£1281
Porters	3250RM	8020RM			*£1604
Boats	5000RM	5310RM			*£1062
Staff	13250RM	10005RM			*£2001
Transport (staff/food)	0RM	2439RM			*£488
Equipment	£2000			£2332	£2332
Misc	£200	2147RM	414RM	£60	*£572
Printing	£300			£300?	£300
Total	£11668				£12100

**Note that items purchased in RM, particularly those purchased with cash, have an approximate equivalent value in GBP based on a rate of 5RM = £1. In reality, depending on who obtained the cash and when/how, the true exchange rate varied in the approximate range £1 = 4.7RM to 5.38RM.*

The finances of the expedition were run through an account with a modern, mobile only bank. One of the major benefits of this was that foreign transaction fees could be avoided, and the debit card was therefore used for the majority of the initial shopping in Miri, and for payments to the national park. The potential savings of this were found to be substantial. For example, for the cash portion of the expedition fees (£300, in ringgit), members who used a high street bureau de change found this to be equal to roughly 1400RM, whereas the charge-free debit cards resulted in some 1540RM, a saving of almost 10%.

The amount of cash that can be withdrawn with a debit card each day is usually limited (often to around £300). This was a further reason for attempting to do the majority of the initial shop directly on a debit card. Many of the costs of the expedition cannot be done in this way, particularly paying for porters/boats and food bought during the expedition (by Venio). Whilst the total spend of the expedition was fairly close to the initial budget, these cash-only costs made up a larger proportion than was anticipated. This then required some expedition members to withdraw further cash at Miri

airport on the return to pay some final expenses, in order to be able to access the funds in cash. Although they were quickly reimbursed from the main trip account, this was not an ideal situation. As the prevalence of bureaux de change on the UK high street drops, this is likely to become a persistent challenge.



Helen on the bridge at Kuala Berar

Frank Pearson

Conclusions and Prospects

Frank Pearson & Rob Middleton

The expedition fulfilled many of the objectives it set out to achieve. A new link was made between the Africa Camp area of Whiterock and the Racer Series of Blackrock, though the anticipated finds in Blackrock will have to wait for a future expedition. The leads in Whiterock revealed considerable new passage, amounting to 7 km, while leads in Clearwater also revealed new passage if not of the extent that was expected, amounting to 2.4 km. The ascent of the lead in Hurricane Hole was pushed to a near conclusion – in sight if not in body, reaching a height of 180m.

The expedition members worked well together, team structures varied, everyone supported each other, good health was maintained, surveys and journals were kept up-to-date, and camps were well stocked and cleared out thoroughly. A complete inventory of equipment was made before the team left the park, and the generator and fridge along with various surplus supplies were left securely at Camp 5 for the following expedition in December. Good relations were always kept with the Park and Forestry authorities and staff.

Neither of the two leaders had led an expedition to Mulu before, though both had been on numerous expeditions there previously. There was much to learn, especially with the logistical arrangements which are complex and liable to change depending on conditions and the challenges of the unexpected. The key factors are the transport of equipment and supplies from Miri to Mulu / Camp 5 and the re-supplying of Camp 5. Equipment and supplies may be transported from Miri to Mulu via air freight, pick-up truck and boat, or both; it is necessary to plan. Quantity and weight are obviously key factors in this choice. Supplies in Camp 5 must serve both those in camp and those in underground camps. It is a fine balance with a relatively large team and with members leaving and arriving at different times. Our understanding is that the availability of porters is not as straightforward as it has been on past expeditions and so the expected timings for the transportation of equipment and supplies is subject to change. It is important to plan for all eventualities with Veno Enar, our logistics organiser, well in advance of the expedition.

The division of the expedition between Park HQ and Camp 5 worked well with regular communications between both and with the coordination of boats for those leaving and those moving up the river. The division of equipment and supplies was thoroughly planned before hand and all went to plan apart from the unfortunate oversight of the Park HQ team's cake allocation.

The possibilities for further exploration are plentiful. The scale of Whiterock and Blackrock mean that leads are often overlooked. The new find, Clickbait, has been 'hiding in plain sight' above the exit of Dr Disto's Ramp and the extension, Cheese Mauler, was found in a large breakdown chamber that had been passed through previously though not fully surveyed. Several other leads exist in this chamber and other such leads are anticipated in this area around the Africa Camp and Out of Africa area. Leads exist at the end of Bleak Expectations in Clickbait and at the top of the ramp before the end of the Cheese Mauler passage (possible way up into the fourth horizon). It seems that some major 'trunk roads' were originally discovered and surveyed in great lengths, perhaps with old lighting technology, and then used as ways to distant exploration leaving obscure entries unexplored, the new finds off Daydream Believer are an example of this re-exploration. This re-exploration is certainly a reason to return to Blackrock, especially now with the relatively quick and easy access through Africa's Dancing Queen extension.

The major discovery of the expedition, Shimmering Showers series (almost 2km of major new trunk passage), was found due to careful study of previous surveys and a re-evaluation of previous assumptions. The pitch had been initially found in 2015, and not dropped due to an assumption that it would hit known passage, when in fact it was entirely new and spectacular. There is now one

further major lead in the area, another pitch dropping down into another large trunk passage again in a blank space on the survey; exciting times for future exploration in Whiterock.

The climb in the Mother of all Voids was sporting and impressive, and successfully managed to climb the full height of the right wall of the chamber to 100m above the entrance, more than 180m above the floor. There remains a further possible lead in the chamber, right at the apex of the dome some 50m above. This would involve a further 50-100m of overhanging aid climbing to ascertain if it was a goer but would be an awesome project.

A team spent a day exploring the south side of the Melinau Gorge up along the foot of the cliff that runs around the back of Gunung Api into the large catchment area below Gunung Mulu. No cave entrances were found, the ground here is heavily forested and viewing the cliffs above the treeline is difficult though further exploration here may reveal something.

Overall, there is no doubt that cave is getting harder to find in Mulu. Within in the Clearwater system, most major trunk routes have probably been found. However, those with a keen eye, gritty determination, and often the ability to aid climb, will still be well rewarded with stunning passage as spectacular as ever.



Heading home

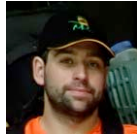
Frank Pearson

Expedition Members

From the UK:



Frank Pearson – Co-leader



Rob Middleton – Co-leader



Helen Fairclough – Treasurer



Dr Rostam Namaghi – Medical Officer



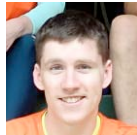
Colin Boothroyd



Pete Hall



Dave Nixon



Jethro Pryke



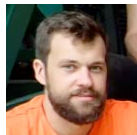
Joe Sharp



Dr Brendan Sloan



Tom Smith



Josh White



Will Yu-Pearson

From Malaysia:



Veno Enar – Logistics



Jimmy Jarau – Boats



Steve Lian - Cook

Acknowledgements

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The Chief Minister of Sarawak
The Sarawak Secretary of State
The Director of Forests, Sarawak
Protected Areas & Biodiversity Conservation Unit, Sarawak Forestry Corporation
The Sarawak Ministry of Planning and Resource Management
The Resident, Miri Division
The Sarawak Immigration Department
The Sarawak Police Department
Gunung Mulu National Park Management and Staff
Hein and Andia Gerstner
Veno Enar and his team for logistical Support
Rambli Ahmad

In the UK

Ghar Parau Foundation
Mark Wright Training
Matt Kirby
Hugh St Lawrence
Mark Brown
Dick Willis
Andy Eavis
Tim Allen
Nick Williams



Camp 5 after a hard day's caving

Frank Pearson

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APPENDICES



Colin Boothroyd in the skylight in Snaketrack, Clearwater Cave

Dave Nixon

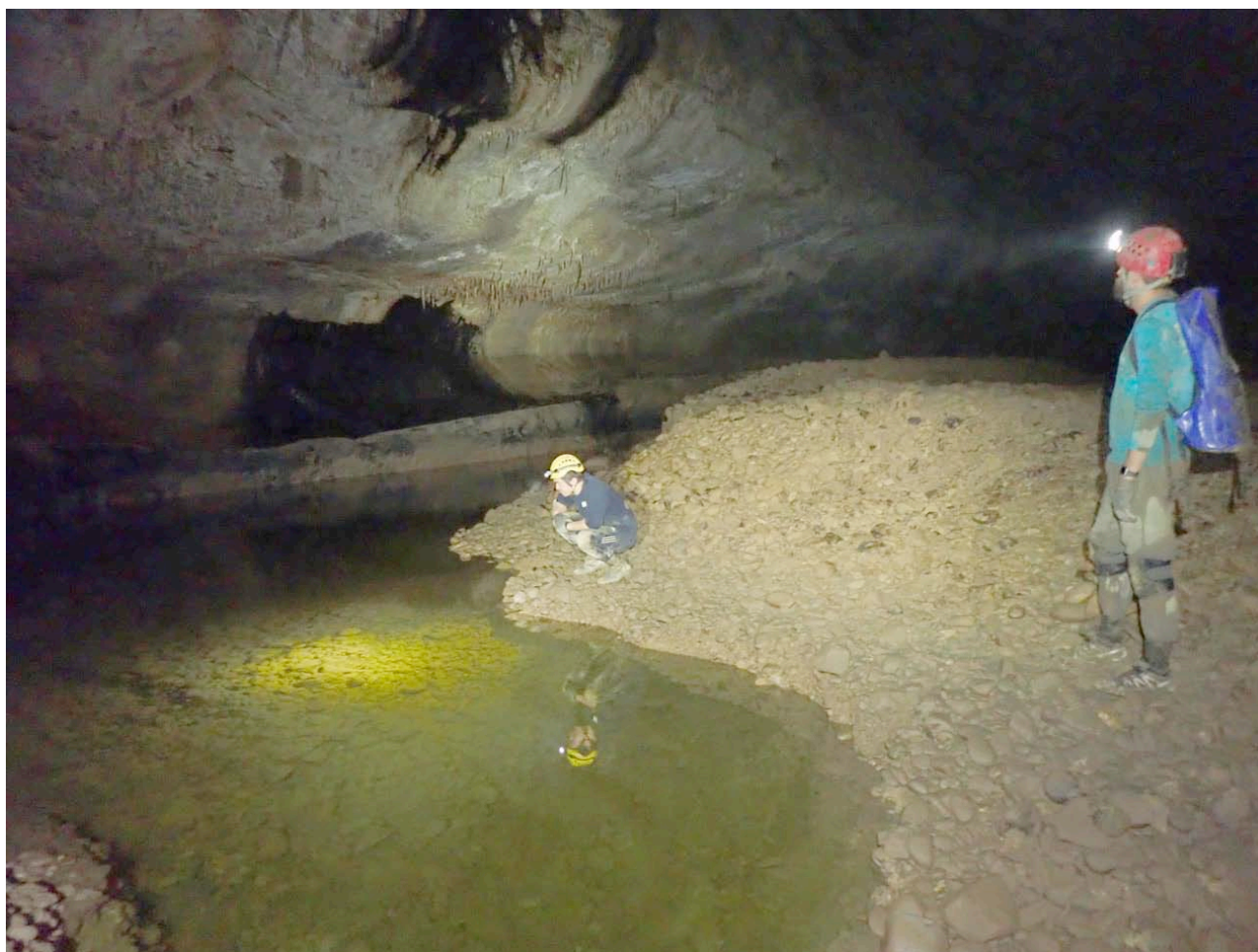
Appendix 1:

October 2019 Discoveries Log

Clearwater Cave					Re-survey work (Clearwater)	
chinashop1	48.96				snaketrack-revival	1562.1
chinashop2	258.42				revival-scumring	1197.66
justanothersquiggle	457.2				dune-bc	666.72
justanothersquiggle2	55.47				dune-bc1	227.91
justanothersquiggle-north1	439.58				dune-bc2	421.92
justanothersquiggle-north2	307.12				Great_Wall_Sheer_Delight	106.57
go_dither	390.46				little_and_large_connection	412.75
						4595.63
	1957.21		1957.21			
Clearwater before expedition	89189.17					
Clearwater after expedition	91146.38					
Blackrock Cave						
ghost_recon	230.19					
	230.19		230.19			
Blackrock before expedition	22441.30					
Blackrock after expedition	22671.49					
Whiterock Cave						
own_goal_waterfall	15.40					
strong_and_stable	144.63					
magic_money_tree	305.19					
perpetual_extensions	439.13					
sharp_folly	118.72					
doncaster_virgin	192.34					
do_you_hear_the_cavers_sing	348.34					
unbeliever	531.1					
own_goal_waterfall	15.4					
clickbait	1153.12					
perpetual_external_2	172.29					
wet_dreams	233.95					
bird_bath	83.96					
on_the_rink	287.35					
magic_money_tree_2	56.11					
shimmering_shower_passage	1605.79					
rabbit_of_negative_euphoria	83.27					
unintended_consequenses	96.25					
bit_on_the_side	40					
rock_it_man	32.93					
i_cant_believe_its_not_better	116.4					
apisment_chamber	169.3					
the_pickle_jar	134.22					
cake_weasel	167.01					
apismal_resurveying	43.7					
cheetah_crawl	132.32					
the_off_key_pitch	140.53					
down_t_pit	134.29					
if_the_shoe_fits	100.47					
	7093.51		7093.51		Hurricane Hole	
Whiterock before expedition	101287.54				moav_climb_1	42.26
Whiterock after expedition	108381.05				moav_climb_2	70.42
					pitch_please	108.78
					treading_water	50.96
		Total Api	9280.91		Total Benarat	272.42
Clearwater System before expedition			228780.55		Benarat Caverns System before expedition	50669.07
Clearwater System after expedition			238061.46		Benarat Caverns System after expedition	50941.49

Josh White – Blackrock Flood

(This expedition was Josh's first trip to Mulu and like most of the expedition team he kept a diary of his daily experiences and cave exploration. As a newcomer, Josh had not had any experience of the equatorial rain and underground flash floods so common in Mulu. He gained this experience on this exploratory trip into Blackrock with Helen Fairclough and Jethro Pryke. He had been down to the Blackrock River on an early trip with Frank and Will Pearson. On that trip the river had almost stopped flowing and was for the most part a sequence of large static pools in the hollows of the vast cobble banks found in the river level of Blackrock.)



Firecracker Streamway in Blackrock Cave, low flow conditions

Frank Pearson

An earlier breakfast than my previous camp in the Africa section of Whiterock set the tone for the day and with my semi-falling-apart shoes and body I was on my way down 'down under', to the lower levels, by 8:30 with a team clearly more capable than me. The next three and a half hours would be spent heading through 'Firecracker', 'Rudang Gallery' and 'The Blow Pipe', three classic Blackrock passages, the first two carrying the seemingly immobile Blackrock River. These were enormous boulder-filled passages with intermittent sandy sections, and plenty of Mulu ramps sloping up into higher levels. One of these was chosen to be the following days lead, and we would leave kit here at the end of the day to save carrying it all the way back to camp. After munching a few snacks, we located 'the crinkly bits', spikey water-worn limestone and splash-formed crystals,

and then set about exploring the existing sections to get our bearings. Jethro free climbed one section that led up to a boulder choke that was possibly passable, but our main lead would be a large draughting ramp that would require bolt climbing.

Whilst Helen worked on linking this climb with the existing survey, I belayed Jethro as he bolt climbed up the ramp. Surveying as we went, we reached the top of the 40m ramp which led to a small chamber and further to a 35m draughting aven. We continued along the existing level for a few survey legs until what we all fear when exploring new cave: “I think this might be a cairn”, and sure enough, there were signs of previous visitors. We found another cairn but no more after that, and strangely both were in illogical places to be of much use in surveying.

‘Ghost Recon’, as we called this old ‘undiscovered’ passage, culminated in a 15m pitch down and a perfectly round pitch to a flat sandy crawl, and a 15m ramp up. Bizarrely at the head of the pitch was an obsolete ring bolt, and we theorised that the only way this bolt could have been placed was by people coming in down the 15m ramp. Perhaps significantly, just at this moment, a cave swiftlet was darting up and down the ramp. It was now 12 hours into our trip, and we were still probably 4 hours away from camp, despite this we decided to bolt climb up the ramp to what we hoped was big stomping passage.

I returned down the main pitch to grab some water, snacks and the surveys so we could collect our thoughts. On my return Jethro and Helen had kitted up to belay and bolt climb respectively, and after snacks and water headed upwards towards glory, or in this case passage heading in the totally different direction from what we expected, and there was no sign of further human activity. This bolt climb was supposed to answer our questions, but we left with more questions than answers, and made the trudge back to camp.

We ditched ropes, drill and batteries at the start of the following days lead and continued for two hours to the start of Firecracker. On the way we noticed the inlets were flowing at a greater rate than previously, which raised concern. These concerns were shown to be well-founded when on arrival to the river we found it was too high to risk being dragged into a sump or become stranded on an island. A decision was made to have a nap on top of tackle sacks and under SRT kits for warmth for a few hours whilst we took stock of what to do.

After three hours of freezing, broken sleep in a draughty passage, the water levels had not reduced, so at 3am we started the four-hour round trip to collect the ropes, drill and batteries as we would be unlikely to be returning the following day. At this point my shoes were absolutely destroyed, and I was totally exhausted, and I stumbled along following Jethro and Helen’s superb navigation. At the kit, we snaffled our emergency chocolate bar and unanimously decided that we needed another nap. We cuddled drills and ropes for warmth for an hour. At 6am we began the return journey to Rudang Gallery for what would be my final time on the expedition.

Fortunately, by our return, the river levels had dropped far enough, and we were able to wade and leap across the river until we reached the ‘down under’ pitch that we had first descended almost 24 hours earlier. At camp at 9am, over a day after leaving, it was time for dinner, and a treat of a bonus cake for such a cracking day. With a plan to get up at 2pm the following “morning”, everyone was asleep by 10pm.

Helen Fairclough – The Discovery of Shimmering Showers Passage

(Here, Helen Fairclough describes the expedition's major discovery, Shimmering Showers Passage.)

It was time for the final camp of the trip, I was on a team with two Mulu veterans, Rob Middleton and Pete Hall, based at the centrally located Propeller Camp. Our first evening of exploration close to the camp had been fruitful, with ongoing potential.

However, for the first full day underground, our target was further afield, at the northern end of the 'Strong Hint of Bigness' (SHOB) passage. Although I had spent the 2017 expedition based at Propeller Camp and exploring the SHOB area, I had not been to the northern end. As I followed Rob and Pete, I quickly found that these northern reaches were far more 'lively' than the areas around camp, and we clambered over mountains of guano. Partway up the passage, some nester's detritus and a change in the draught direction marked the (presumed) entrance location, and the cave slowly started to become cleaner again. After re-rigging the pitches in the (2015) 'Dirty Little Secret' extensions, we were closing in on our target. We stopped for a quick lunch and considered what may lie ahead of us.

The lead we were aiming for was a pitch, noted by the 2015 team, but undescended, as they assumed it was going into a known passage: Northern Line. Later, after we added the data to survex, we found that the pitch was actually some distance horizontally away from any known passage. This was an exciting prospect, as the Northern Line is a very substantial route, and any passage which could be mistaken for it would be a significant find. However, we were cautious; for most of the three hours we had been journeying today we had been heading along a solitary trunk passage. If the pitch did loop back into known passage, the loop would be several kilometres long, and a small percentage error could explain the significant horizontal difference.

We headed through a final squeeze (by this point, the bats had all but vanished) and were soon at the final survey marker left by the 2015 team. Rob and Pete were surveying, which meant I got to do the rigging. An initial ramp downwards led to the window into the passage. As I began to approach the edge, I saw the floor of the main passage around 12m below. However, as I got nearer, it became clear that this was in fact only a ledge on the opposite side, and that the true floor was another 8m below that, forming a very un-Mulu-like vadose canyon, albeit one that was over 15m high and at least 4m wide.

A final couple of bolts and I was ready to descend. With the passage looking so distinctive, we were optimistic that we were not looking at the Northern Line but there was only one way to be certain. I descended, thinking that at any moment I would see a cairn or a footprint and we would be in known passage. In one direction, large boulders filled the floor to the limits of where my light could reach, there was definitely plenty of cave down here. In the other direction the floor was curiously smooth, and as I grew closer, I saw that it was a pristine bed of fine sand. There was no way this had been walked on previously. It was new!

I, very excitedly, shouted up to the others, and they soon joined me. We all agreed it was definitely new, and definitely very impressive. We decided to head south, over the fine sand first. This headed back towards camp and the possibility of appearing in the roof of something known and finding a shortcut home was enticing. I was more or less skipping with excitement as I headed off, leaving the first footprints in the smooth sand, looking for a suitable survey station.



Gour Pool in Shimmering Showers

Helen Fairclough

The going was easy and the survey legs were long as we made our way through a surprisingly varied passage. The sand gave way to mud, then boulders, smooth rock and back to sand, this time in large dunes. The only constant was the high ledges, and passages heading off at high levels, this gave a pleasant air of mystery, although I think Rob was quite sick of all the walls in the sketch being dotted. Several inlets formed waterfalls down the sides of the passage, the rocks of which were generally covered in a lustrous black film.

After a couple of hours, we reached a particularly steeply descending boulder slope and a final short passage of dry mud, where the roof dropped down to a mud sump. Here we stopped for a snack and a quick count of the distance covered so far, which came to around 500m, already a very respectable total, and we had only been in one direction, and left numerous side leads!

We headed back to the base of the pitch and began to survey in the other direction. This passage passed even more inlets with the shimmering black rocks, although these ones were often more like showers filling the width of the passage, leading us to the name Shimmering Showers. Indeed, this direction seemed generally damper and there were a few sections of splashing through water of shin depth. The passage also became gradually more decorated and calcited, until we reached a large and impressive gour pool which filled the width of the passage. We didn't want to unnecessarily damage the gorgeous cracked mud floor of the pool and thought it might be possible to traverse around the stal bosses on a ledge to the right of the pool. However, this really needed some slings and/or handlines, which we had left at the base of the pitch. Time was also getting on, and we had a solid 3 hours of caving to get back to camp, so we decided to leave it for the next day. A quick back-of-the-envelope calculation put this direction on about 500m as well, and put me on tenterhooks, as my

previous best day of exploration (in Mulu in 2017) had resulted in a respectable but also frustrating 950m.

The journey back to camp was fairly uneventful, rain on the surface meant that the guano was even slipperier than before, and I was well coated by the time I returned to camp but, every cloud has a silver lining, as the rain also provided us with a fabulous power shower to clean all our kit in when we arrived.

The next morning, we were to be joined by some other team members, so a leisurely start was had whilst we waited for them to arrive. A not insignificant portion of which I spent doing maths to figure out exactly how much we had surveyed the day before. The final total came to just over 1000m, my first 1k day! I was buzzing as the others arrived, and soon the three of us plus Tom and Jethro were heading back to Shimmering Showers.



Foghorns Flowstone Finale in Shimmering Showers Helen Fairclough

We had another reasonably successful day. After an initial shock as the previously shin deep water was now well above waist depth, we progressed beyond the gour pool to find a further 300m of breathtakingly beautiful passage, Foghorn's Flowstone Finale, eventually led to a calcite choke. Many of the side passages and ledges were concluded or found to be oxbows, although one very exciting lead remains. On returning to the surface, we found that the southern terminal mud sump lies only some 30m from a very similarly described mud sump located just 10 minutes from camp, perhaps offering a dig or shortcut potential? The northern calcite choke appears to lie close to the line of the surface cliff, this is supported by the strong smell of vegetation at that point. Finally, a number of the continuing leads were found to be pointing into blank space; I'll definitely be back.



the MULU Caves Project

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Front cover: Rob Middleton climbing the Mother of All Voids, Hurricane Hole - photo Tom Smith
Rear cover: Whiterock's Propeller Camp - photo Helen Fairclough
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