Report Perlis

Malaysia-Swiss Expedition 2026

Société Suisse de Spéléologie
Societad Svizra da Speleologia
Società Svizzera di Speleologia
Schweizerische Gesellschaft für

GotoSatoshiPhotography

High Level Summary

The expedition cooperation between the University Malaya (University of Malaysia), the Malaysian Cave and Karst Conservancy (MCKC) and the Swiss Speleological Society (SGH) documented the caves at Perlis from 24. January – 3rd of February 2026. It resulted in the survey of 7.7 km of passages in 10 caves with Gua Kelam 2 being 3.8 km and Wang Mu of 1.3 km length. The exploration of caves with a tin mining history requiring special techniques was an unforgettable experience. There are minor leads open as well as the descent of two pits with a depth of more than 140m.

Title: Malaysia-Swiss Caving Expedition 2026 – Report Perlis
Author: Joerg Dreybrodt
License of this work: CC BY-NC-SA

Contents

1. Introduction 3
2. Geology of Perlis 4
3. Tin Mining History in Perlis 5
4. Cave Maps 6
5. Cave Science 7
   5.1. Hydrology 7
   5.2. Palaeontology 7
6. Photos 8
   6.1. Kaki Bukit Gua Baba 8
   6.2. Chuping Hills 9
   6.3. Gua Kelam 2 10
7. Cave Fauna 11
8. Summary and Outlook 11
9. Expedition Members 12
10. References 12
11. Acknowledgement 13
12. Budget 13

1. Introduction

The caves of Peninsular Malaysia have been documented by international caving expeditions from 1998 until 2012. The best overview of caves is currently published in the registry of the Berliner Hoehlenkundliche Berichte. Nevertheless, it is in an initial state with many coordinates and cave descriptions missing. Cave maps exist only from selected caves of a few areas. This is surprising since the landscape is diverse from tropical islands to isolated karst hills and national forest karst parks.

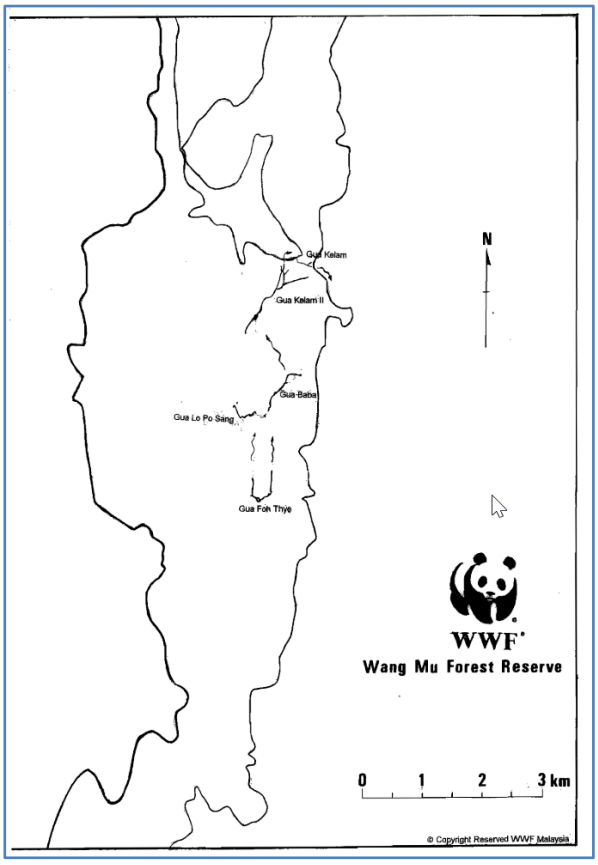
The caves in Perlis have been previously visited by the WWF Malaysia in 1992 mapping the Gu Kelam II. Later the survey continued in cooperation with the Axbridge Caving Group (UK) in two expeditions in 1996 and 1998. The expedition logbooks are on the club page. Despite severe effort to contact the group or find former group members, the original surveys cannot be retrieved. The reports contain a lot of details of the cave visits and expedition life, but missing any location information. The most extensive summary is the WWF Report from 1998 with detailed cave descriptions and several maps, often not to scale. As for the Axbridge report, locations are not shared.

The caves in Perlis are unique since they contain alluvial tin deposits and have been mined extensively until 1980. Therefore, natural cave passages connect with man made extended passages and a lot of mining debris is scattering on the floor. The mined passages with deep pits are now flooded making the survey an adventure by swimming and walking over old, decayed walking bridges fixed by metal wires on the ceiling.

The expedition cooperation between the Department of Geology, Universiti Malaya (UM), Malaysian Cave and Karst Conservancy (MCKC) and the Swiss Speleological Society (SGH) documented the caves in Perlis from 24th of February 2026 for 12 days with the base in Kaki Bukit. The local Perlis Climbers group enforced the team together with the very knowledgeable community hiking guide Along. The main objective was the survey of the most known cave Gua Kelam 2, Wang Mu at the southern edge, finding the entrance to the surface shaft Foh Thye. This was achieved at the last day. A new cave was found not mentioned in the reports with Fai Soo Long. Two days were spent scouting along the edge of the mountain ridge and to Wang Keliam. Few short dives took place to check the potential of several sumps.

The map to the right from the WWF report provides and overview of the mapped caves until 1998.

.



2. Geology of Perlis

The Perlis area, dominated by the Nakawan Range, showcases a diverse stratigraphic history through five major geological formations.

1. Machinchang Formation (Upper Cambrian)

As the oldest rock unit in Peninsular Malaysia, this formation consists primarily of thick quartzite with layers of shale and conglomerate. It surfaces near the Wang Kelian border.

2. Setul Formation Limestone (Ordovician to Lower Devonian)

Covering 60% of Perlis State Park, this dark gray, fine-crystalline limestone spans the Nakawan Range into Thailand. Tin Mining: The contact zone between this limestone and the Bukit China Granite led to cassiterite (tin ore) mineralization. These deposits were mined in underground caves until the global price collapse in the early 1980s.

3. Kubang Pasu Formation (Late Devonian to Triassic)

Located east of Wang Kelian, this younger unit comprises red and gray shale, mudstone, and quartzite. It extends throughout central Perlis and northern Kedah.

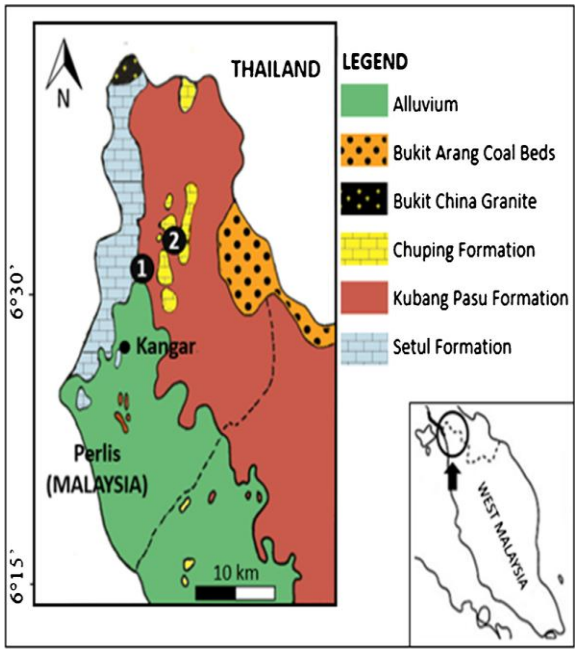
4. Bukit China Granite (Mesozoic)

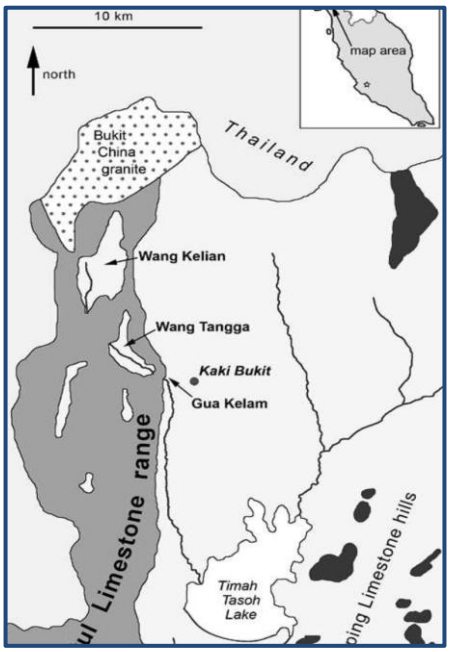
This 8-square-kilometer granitic body sits north of Wang Kelian. It is the primary source of the rich alluvial tin found in northern Perlis caves, particularly where it meets the Setul Formation.

5. Chuping Limestone Formation (Permian to Triassic)

Though outside the State Park, this formation creates the iconic tower karst hills of central Perlis. This light-colored, massive limestone contains large cave chambers but few surface streams. The expedition area lies within the Setul Formation Limestone, which forms key geological features such as the enclosed valleys of Bukit Wang Kelian and Wang Tangga.

Map 1: Geological map with the main formations in the northern part of Malaysia and b.) the location of the enclosed valleys (Wangs) in the expedition are of Kaki Bukit.





3. Tin Mining History in Perlis

The caves in Perlis are unique since they have been mined for alluvial Tin deposits. The Tin mining in Perlis began in the early 20th century, though it is believed that Chinese miners were already extracting tin from the region as far back as the 19th century. Modern mining equipment was only introduced after World War I, leading to a significant increase in production. Although Perlis contributed just 0.7% of the country's total tin output, mining was pursued with determination in the hope of striking rich deposits. On one remarkable occasion, a miner uncovered a pocket of cave alluvium containing 90% tin ore—valued at more than $1 million.

Most of the larger mines were cave-based, with a few open-cast operations scattered across the area. These mines were concentrated within a 4 km radius of Kaki Bukit, particularly inside what is now the Wang Mu Forest Reserve. Tin ore was extracted from cave alluvium, which could either blanket entire chambers or form only a thin layer on the cave floor. In some places, miners dug several hundred feet into deep pockets of alluvium. They followed cave passages in search of richer seams, often blasting through narrow corridors in hopes of finding new extensions. Prospectors scoured the hills for cave entrances, making them Malaysia's earliest cavers—driven not by exploration but by the lure of fortune.

Over time, nearly all caves in the Nakawan Range were explored, and those containing viable deposits were mined. In some cases, separate caves were unintentionally connected as miners removed the alluvium. While some argued this restored the caves to their original form, the biological and geological damage was irreversible. Mining boundaries were often based on surface divisions, meaning multiple companies could operate in different sections of the same cave. Wooden doors were built underground to mark territories, but disputes were common, sometimes even escalating into armed clashes. Stakes were high: it was not unusual for two companies to discover they had been working opposite ends of what turned out to be the same cave system.

The work was perilous. Sudden heavy rains could flood the caves, drowning miners downstream. Underground streams were sometimes dammed to allow access or create reservoirs for high-pressure pumps; if these dams failed, miners were again at risk of deadly floods. Other accidents included falls from makeshift ladders and scaffolding. Many of these incidents went unreported, as investigations could result in mine closures.

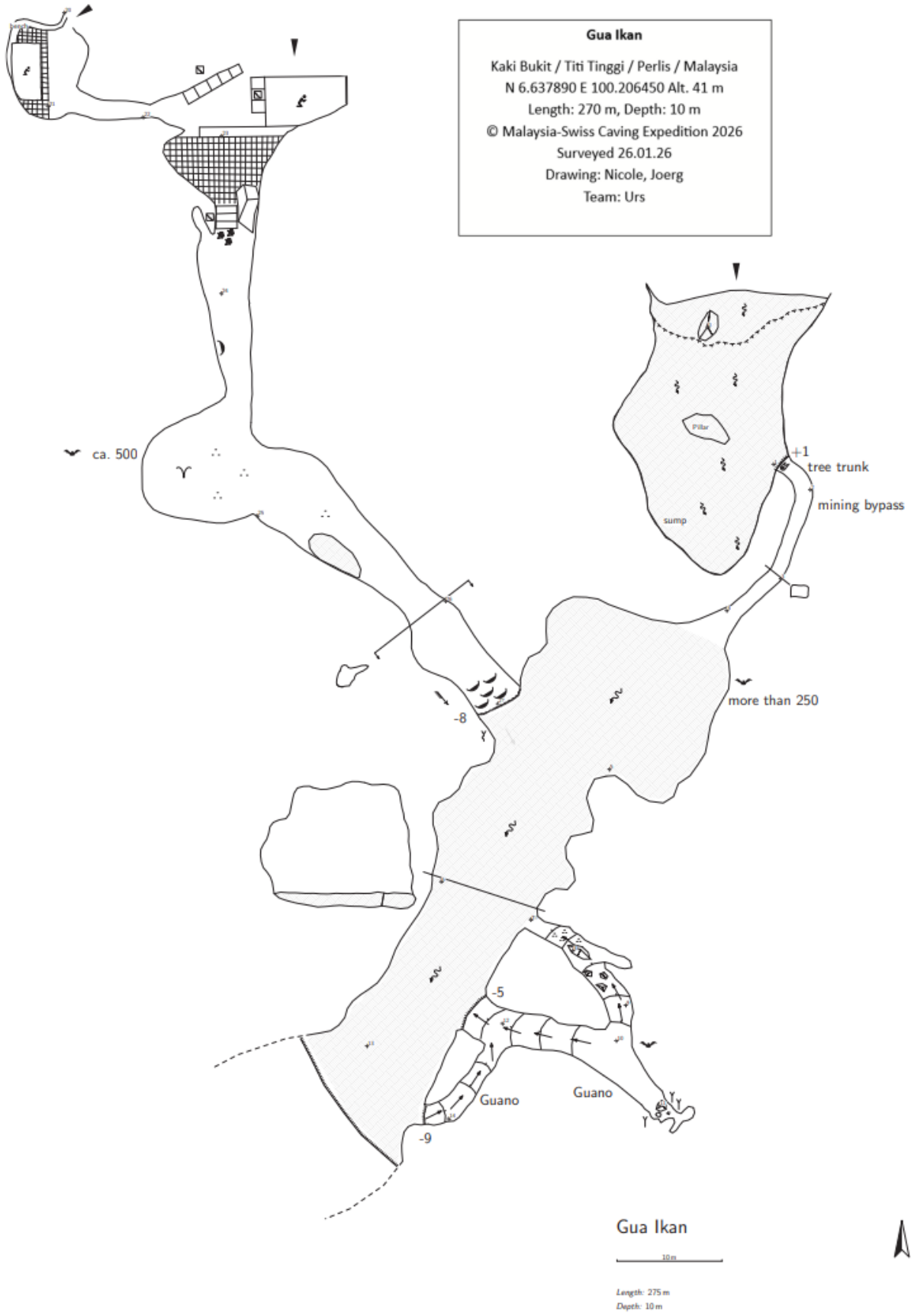
Mining methods varied. Larger operations used monitor pumps to wash sand and gravel, while smaller mines relied on teams of labourers practicing the traditional method of panning. Separation of ore often took place in small installations inside the caves, or material was pumped outside for processing. Some gravel had to be hauled out manually, though rail tracks were later installed in bigger mines to transport ore and workers. Electric lighting was commonly used underground. In addition, open-cast mines were established in the dry wangs of the region.

Operations were heavily influenced by seasonal rainfall. During the wet season from December to February, mines typically closed due to the threat of flooding. Prolonged dry spells, on the other hand, created water shortages that hindered sluicing operations. To counter this, larger mines-built ponds in the hills to maintain water supply.

By the 1960s, most of the caves had been nearly exhausted after the mining workforce peaked at around 2,500 laborers. The global collapse of tin prices in the 1980s sealed the fate of the remaining operations, forcing mines across the region to shut down.

Today, all mining activity in Perlis has ceased. The area is a Forest Reserve and part of Perlis State Park.

4. Cave Maps


Gua Ikan
Kaki Bukit / Titi Tinggi / Perlis / Malaysia
N 6.637890 E 100.206450 Alt. 41 m
Length: 270 m, Depth: 10 m
© Malaysia-Swiss Caving Expedition 2026
Surveyed 26.01.26
Drawing: Nicole, Joerg
Team: Urs
ca. 500
Pillar
+1
tree trunk
mining bypass
sump
more than 250
-8
-5
Guano
Guano
-9
Gua Ikan
10 m
Length: 275 m
Depth: 10 m

5. Cave Science

5.1. Hydrology

The temperature and conductivity were recorded at several streams in Gua Baba. The stream temperature was with 25.5. C relatively warm. The comparison of the parameters allows relative conclusions on how long the water is in the underground and saturation. First analysis shows similar data for taken measurements.

Conductivity meter with a display for Conductivity and Temperature

5.2. Palaeontology

The expedition identified various fossils in several caves in the recent and expedition from 2025. These included bats, gastropods, rats/gastropods, unidentified bones, shells, archaeological middens with shells, nautilus, deer, wild boar, monkey, rhino, Quaternary breccia with gastropod fossils, and a small section of Quaternary midden.

Photo: Fossils on a cave wall nearby Kaki Bukit.

6. Photos

6.1. Kaki Bukit Gua Baba

6.2. Chuping Hills

6.3. Gua Kelam 2

7. Cave Fauna

The following cave fauna was identified while surveying the caves: Bats, millipede, snake, crabs, toads, turtles water snakes, many varieties of fish as snake head and saddled barb.

Turtle in a water stream

8. Summary and Outlook

The caves are mostly located in the eastern edge of the mountain range extending south of Kaki Bukit to Kangar. The 10 days resulted in the survey of 7.7 km passages in 10 caves with Gua Kelam 2 being 3.8 km, Wang Mu 1.3 km and Fai Soo Long of 1.2 km length. The entrance to the surface shaft Foh Thye was found at the last day and the main pitch descended. There are several minor leads and the connection of Foh Thye to suspected Fai Soo Long or Wang Mu to confirm.

Table of surveyed caves:

No.	Date	Name	Alternate Name	Village	District	State	Length (m)	Depth (m)
1	25.01.26	Wang Mu	Mineral Water Cave	Wang Mu	Titi Tinggi	Perlis	1,255	54
2	25.01.26	Gua Kelam 2	*Stream entrance*	Kaki Bukit	Titi Tinggi	Perlis	3,868	94
3	26.01.26	Gua Ikan	Latukung Tham, Cobra Cave	Kaki Bukit	Titi Tinggi	Perlis	270	
4	26.01.26	Boss Cave		Kaki Bukit	Titi Tinggi	Perlis	37	
5	26.01.26	Cartoon Cave		Kaki Bukit	Titi Tinggi	Perlis	67	
6	27.01.26	Gua Baba		Kaki Bukit	Titi Tinggi	Perlis	560	
7	27.01.26	Gua Wang Tangga	Cave 17 Hymeir List	Wang Tangga	Titi Tinggi	Perlis	85	
9	28.01.26	Gua Rongkit Katong	Rongkiak Katong	Wang Kelian	Titi Tinggi	Perlis	70	
14	29.01.26	No name	29012026	Wang Mu	Titi Tinggi	Perlis	236	
15	29.01.26	Fai Soo Loung		Wang Mu	Titi Tinggi	Perlis	1,219	136
							7,667	

9. Expedition Members

Malaysia Ros Fatihah Muhammad, Zarris Kem, Lian Kie Lee, Ahmat, Ramon, Fiona, Sharah Aizat, Amirul, Along, Syamil

International Joerg Dreybrodt, Urs Etter, Chloe Snowling, Nicole Zenhaeuser, Satoshi Goto, Daiki

Contact Expedition: Dr. Joerg Dreybrodt, E-Mail: Joerg.dreybrodt@gmail.com

10. References

Caves of Malaysia: https://cavesofmalaysia.wordpress.com/
Malaysia Cave Registry: https://www.speleo-berlin.de/en_publikationen.php
Price, L., 2011. Tin mining in the limestone caves of Perlis, Malaysia. *Acta Carsologica*, *40*(3).
Hymeir Kamarudin, WWF Malaysia Project Report, The survey of limestone caves of Perlis, Part 1: Caves of the Perlis State Park, 86 pages, December 1998.
Report Axbrige Expredition 1998: http://axbridgecavinggroup.wikidot.com/malaysia-23rd-january-12th-february-1998

We appreciate the permission of Satoshi Goto to use his pictures for the publication of this report.

11. Acknowledgement

We are grateful to our local partners Perlis Climbers Association, Kaki-Bukit Community and Perlis Nature Xplorer. Special thanks to Mr. Mohd. Alzat Bin Zahid, the president of the Perlis State Forestry Mountaineering Guides (MGP) & Secretary of the Perlis Climbing Association, Mr. Along, our valuable community guide, Mohd. Amirul bin Baharti and Syamil Abd Rahman. We appreciate being granted permission from the Perlis Forestry Department.

The Status as EuroSpeleo Project from the FSE European Speleological Federation is highly appreciated as well as related sponsoring from Aventure Verticale (AV) with equipment.

12. Budget

Item	Number	Cost	Participants	Sum of Cost
Flights	6	800	4	4800
Accommodation	12 days	20	10	2400
Food	12 days	20	10	3400
Minibus	10 days	70	-	700
Boat hire	3 days	100	-	300
Admin	2	150		300

Total Cost of the Expedition: 11.600 Euro