

# Som Hein, Mapping of Longest Cave in Myanmar

## Som Hein, la découverte de la grotte la plus longue au Myanmar

Nyi Nyi Aung (1,2), Fleur Loveridge (1, 3), Mike Futrell (1), Pete Talling (1), Andrea Futrell (1)  
& Dominik Frohlich (1).

(1) Myanmar Cave Documentation Project  
(2) Myanmar Karst & Caves Conservancy  
(3) corresponding author, fleurloveridge@hotmail.co.uk

### Abstract

Myanmar karst and caves are among the least studied areas in South East Asia. At 80,000 km<sup>2</sup> (10% of SE-Asia-Karst) this area is still a blank spot for world karst mapping as the majority of regions are in Ethnic Armed Territory. After the “2017-First Myanmar Cave Training”, Myanmar cavers started to join annual International expeditions. In December 2019 and January 2020 this new collaboration resulted in a joint local and international team visiting the Eastern Shan for cave mapping for the first time. After spending several days surveying caves near the Thai-Myanmar border, the team travelled to Som Hein cave in Monghpyak area, after permission was granted by the Head Monk Mung Ling Sayadaw. The team documented 11.6 km (7.2 mi) in a complicated cave system over 9 short days. This established the longest cave in the country, doubling the previous limit (Khauk Khaung Cave 4.8 km). The entrance and first kilometer of passage are used as a pilgrimage area for meditation and are decorated with Stupa & Buddha Images. Many passages and leads were left for Myanmar and international cavers to return to for further exploration.

### Résumé

Le karst ainsi que les grottes au Myanmar sont parmi ceux les moins étudiés en Asie du sud-est. Ce terrain, de 80.000 km<sup>2</sup> (10% du karst de l'Asie du sud-est) est toujours quasi-inconnu par les cartographes en raison du fait que la plus grande partie de ce terrain se trouve dans < l'Ethnic Armed Territory > (*Territoire militaire ethnique*). Après la < Première formation de spéléologie au Myanmar – 2017 >, les spéléologues du Myanmar ont commencé à participer aux expéditions internationales. Suite à cette nouvelle collaboration, pendant les mois de décembre 2019 et janvier 2020, une équipe de spéléologues locaux et internationaux s'est rendue dans le Shan de l'est pour cartographier les grottes pour la première fois. Après avoir passé plusieurs jours en arpentant des caves près de la frontière thaïlandaise-myanma et après avoir obtenu l'autorisation du moine principal Mung Ling Sayadaw, l'équipe s'est rendue à la grotte Som Hein dans la région de Monghpyak. L'équipe a documenté 11.6 km dans un système de grottes compliqué pendant neuf courtes journées. On a confirmé que c'est la grotte la plus longue du pays ; le double de celle précédemment arpentée (la grotte Khauk Khaung qui a une longueur de 4.8 km). L'entrée ainsi que les premiers 1.000 m sont utilisés comme un endroit de méditation pour les pèlerins et sont décorés avec des stupa et des images du Buddha. On a laissé beaucoup de galeries et d'indications pour des explorations plus approfondies éventuelles des spéléologues myanma et internationaux.

### 1. Introduction

Despite an estimated karst area of 80,000 km<sup>2</sup>, approximately 10% of the whole of south East Asia (DAY & URICH, 2000), the speleological potential of Myanmar was not investigated until the 1980's onwards. Initially small-scale reconnaissance only was carried out due to difficulties in access and the isolation of the country for several decades. These early investigations, summarised by Dreybrodt et al. (2013) and Laumanns (2010), included short visits, regular work by expatriate cavers, and later French and Italian expeditions. They demonstrated the clear potential for significant cave development, as well as highlighted the challenges of access to key karst areas, many

of which are located in regions of the ethnic armed territories.

The last decade has seen greater freedoms within Myanmar, and removed some barriers to more systematic cave exploration within the country. Starting in 2009, Joerg Dreybrodt set up the Myanmar Cave Documentation Project (MCDP), following initial contact with the Myanmar Tourism Promotion Board. The following decade has seen twenty expeditions organised under the MCDP banner, covering the Shan, Kayah and Kayin states. In recent years, the international component of these expeditions has greatly increased, with 13 nations now involved. In addition, the

development of speleology as a sport and a science within Myanmar has been significant since the first MCDP Myanmar Cave Training in June 2017. Following this training, collaboration between Myanmar and International cavers has led to successful cave mapping projects and a number of conservation and education initiatives (DREYBRODT & AUNG, 2019).

Early MCDP expeditions focused on the southern Shan State, in the areas to the east of Taunggyi. Early significant caves included Hopon Spring Cave (1.7km) and White Water Buffalo and Tiger Cave (1.3km), both active resurgence caves (LAUMANS, 2010, DREYBRODT & LAUMANN, 2013).

## 2. Eastern Shan Expedition, 2019-20

At the end of December 2019 an international team of MCDP cavers from Myanmar, UK, USA and Germany gathered in Tachileik, Eastern Shan State (Figure 1, Figure 2). This area had not before been visited by speleologists, although a major cave of spiritual significance in the Buddhist faith was known to exist. Inspection of satellite imagery and geological maps suggested both the presence of limestone in some areas and topography such as closed depressions, which strongly indicated karst development.

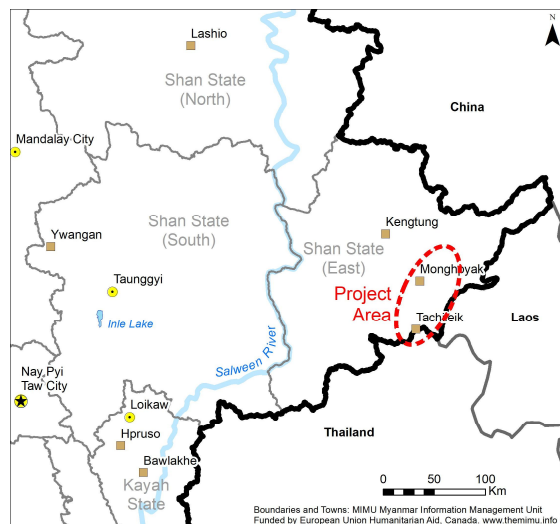


Figure 1 : Expedition Location in Myanmar

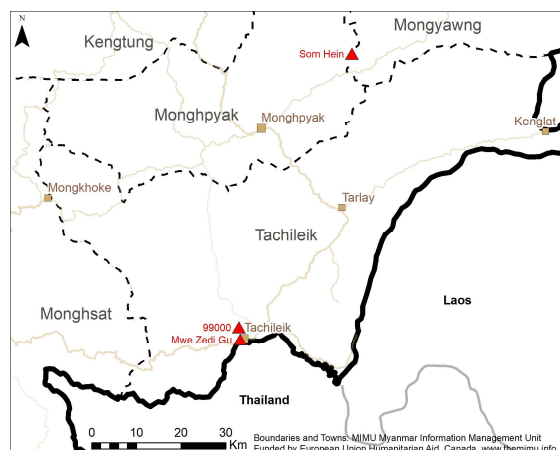


Figure 2 : Som Hein and other Cave Locations

For some years, Khaik Khaung (Stone Cave), located in Ywangan Township, Southern Shan State, and explored between 2012 and 2014, had remained the longest mapped cave in the country. This large river sink gives access to 4.8km of complex active, seasonal active and fossil passages on a grand scale (DREYBRODT & LAUMANN, 2013, DREYBRODT & LOVERIDGE, 2018). Long active river caves were also mapped in Kayah State, near Hpruso (Phruno River Cave, 4.6km and near Bawlakhe (Red River Cave, 4.1km) between 2015 and 2017. At Phruno River Cave exploration still continues.

Initially the expedition team stayed within the city of Tachileik, the local administrative centre. This served two purposes: first the documentation of the first caves from the Eastern Shan in the small blocks of limestone nearby. Two small caves were mapped close to Tachileik city, 99,000 Gu and Mwe Zedi Gu (Figures 3 and 4 respectively).

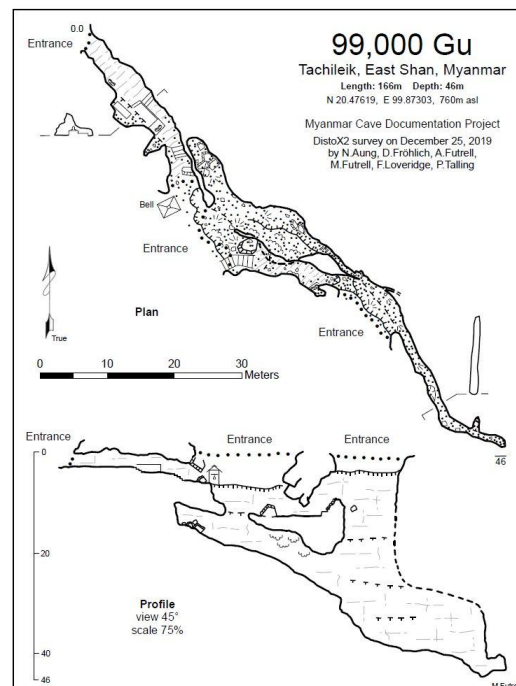


Figure 3 : 99,000 Gu

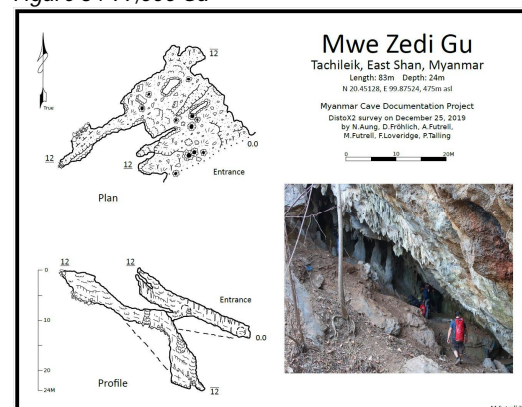


Figure 4 : Mwe Zedi Gu

Second, and more importantly, permission was sought to travel further afield to Monghpyak township (Figure 2), which was the main focus of the expedition. The expedition liaised with both the Ministry of Hotels and Tourism within Tachileik, and also the Head Monk Mung Ling Sayadaw. The Sayadaw informed the expedition team of a large cave

within his jurisdiction called Som Hein, and granted consent for the expedition team to visit and map the site. In the local Shan language Som Hein translates loosely as “famous mountain”, which was appropriate for a cave well known locally and commonly frequented by Buddhist monks and other pilgrims.

### 3. Exploration and Mapping of Som Hein

After permission was granted to explore and map Som Hein, the expedition team moved to Monghpyak with consent from the Ministry of Hotels and Tourism. Basecamp was made within a local guest house, from which a daily van journey of up to 90 minutes in each direction was made to visit the cave. The main cave entrance is located at the Monastery of the same name, and is some 2km to the east of a major closed depression, where a river sinks into the ground, that had previously been identified from satellite images. However, unlike all the other major cave systems of

Myanmar so far documented, this active river has not yet been seen underground in Som Hein.

Som Hein is accessed directly within the monastery grounds via one of two large fossil entrances that soon reunite and form the main large fossil passage of the entrance series. For the first 1km, this passage continues well decorated with Buddha and Stupa images and other religious ornaments (Figure 5, Figure 6). Some small side passages are present that are clearly used for meditation practice, but most terminate after only a short distance.

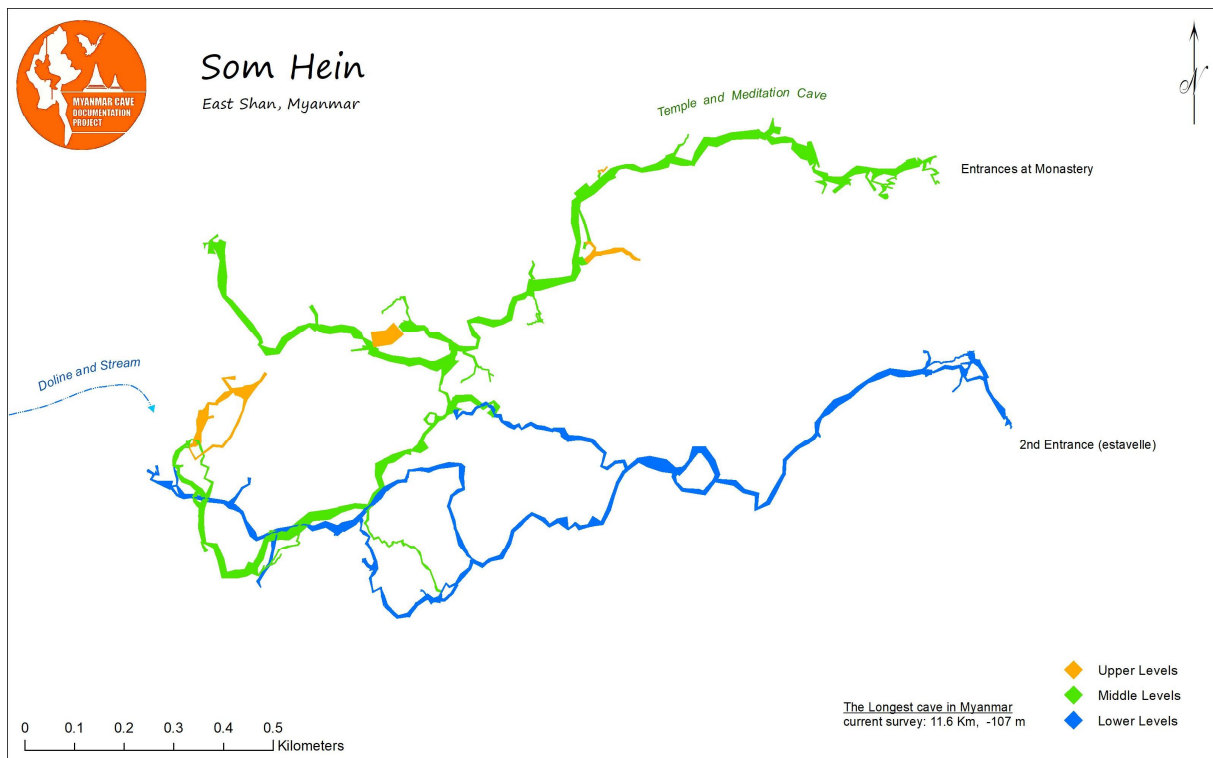


Figure 5 : Survey of Som Hein

The first major junction is around 1400m from the entrance. A small dry watercourse enters from the left and a major trunk route exits to the right. The right hand route continues as large passage to a major boulder choke under another side passage. A smaller walking, stooping and crawling passage continues before being left open and draughting. Back in the main passage, at 1500m from the entrance another major junction is reached. To the right a major trunk passage continues for over 0.5km, including passing the largest chamber in the cave, which is above the boulder choke previously mentioned. This trunk route was left open at a number of drops and climbs requiring equipment.

Straight ahead, the main way continues, briefly smaller before enlarging again. Passing a short but large side passage to the left, the main route reaches the “windy junction”. To the right is in excess of 1km of major fossil passage (Figure 7), including some higher level passages (orange in Figure 5). To the left is a small development of rifts and cross rifts, which eventually lead down to the lower seasonal river passages which take the monsoon flow. A complex of oxbows and inlets span 2km east to west. At the western extent the cave comes close to, but never reaches the river sink in the adjacent closed depression. However, upstream inlets remain open and to be explored.



Figure 6 : Giant Buddha close to the entrance of Som Hein



Figure 7 : Major trunk fossil passage in Som Hein

Downstream to the east, the main route continues as large passage until a dip of the roof at a static pool. This is the only significant water met in the cave during the expedition, with all other remains of the past monsoon having evaporated. Beyond the pool, the passage enlarges again before reaching a boulder choke. An obscure route through boulders reaches the surface above a small year round stream sink, hinting at the complexity of the local drainage. Several major inlet passages remain to be explored and mapped. Also of note is the coincidence in plan of some of the main mid level passages and the lower monsoon river levels beneath (Figure 5).



Figure 8 : Downstream monsoon river passage in Som Hein

## 4. Future Work

The survey of Som Hein, which totals 11.6km, remains incomplete, with a number of passages left wide open at the end of the expedition. Plans to return to the site with a Myanmar team before the monsoon of 2020 could wash away survey markers in the seasonal river passages were thwarted by the global covid-19 pandemic. A top priority for the MCDP therefore remains to return to the area and complete the exploration and survey. The year round active underground streamway that sinks nearby also remains to

be located, and the geomorphology of the surrounding hills suggests that further cave development could be significant. As well as documentation work, conservation messaging in the local area will be important future tasks to help preserve water resources and biodiversity as the monastery further develops as a pilgrimage site. Current road and other infrastructure construction attests to anticipated future increases in visitors to the cave, which could put pressures on the unique karst site.

## Acknowledgments

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