

Republic of the Philippines Department of Environment and Natural Resources PENRO MARINDUQUE

November 29, 2022

DENR MIMAROPA PEGGROS SECTION

LI DUTGOING

INCOMING

MEMORANDUM

FOR : The Regional Executive Director

DENR - MIMAROPA Region

THRU: The Assistant Regional Director

for Technical Services

FROM: The OIC, Provincial Environment and

Natural Resources Officer

SUBJECT: REPORT ON THE CONDUCTED DETAILED CAVE

ASSESSMENT IN THE PROVINCE OF MARINDUQUE

FOR CY 2022

Respectfully submitting the report on the conducted detailed cave assessment in Labao Cave, located at Barangay Sayao, Municipality of Mogpog, Marinduque. Please be informed that the Provincial Cave Assessment Team (PCAT) – Marinduque and the staff from Biodiversity Conservation Unit has completed the assessment and have recommended that the Labao Cave is under the classification of Class II – Guided Tourism. However, be informed further that the team will submit the map after its finalization.

For information and record.

IMELDA M. DIAZ



Republic of the Philippines Department of Environment and Natural Resources PENRO MARINDUQUE

November 28, 2022

MEMORANDUM

FOR

The OIC, Provincial Environment and

Natural Resources Officer

FROM

The Chief, Technical Services Division

SUBJECT:

REPORT ON THE CONDUCTED DETAILED CAVE

ASSESSMENT IN THE PROVINCE OF MARINDUQUE

FOR CY 2022

Respectfully forwarded is the report on the conduct of the detailed cave assessment for Labao Cave, located in the Municipality of Mogpog in the Province of Marinduque.

For information and record.

"For and in the absence of the Chief, TSD"

SIMEON R. DIAZ

In-Charge, Office of the Technical Services Division



Republic of the Philippines Department of Environment and Natural Resources PENRO MARINDUQUE

November 28, 2022

MEMORANDUM

FOR

The Chief, Technical Services Division

THRU

The Chief, Conservation and Development Section

FROM

The Staff, Biodiversity Conservation Unit

Provincial Cave Assessment Team of Marinduque

SUBJECT

:

DETAILED CAVE ASSESSMENT FOR LABAO CAVE

LOCATED AT BRGY. SAYAO, MOGPOG IN THE

PROVINCE OF MARINDUQUE FOR CY 2022

Relative to the activity under the Management of Caves and Cave Resources, please be informed that the undersigned had conducted detailed cave assessment in Labao Cave, located in Barangay Sayao, Municipality of Mogpog, Province of Marinduque.

The assessment was completed after two (2) scheduled activity. Since the Provincial Cave Assessment Team (PCAT) is composed of multi-sectoral members, schedules were adjusted based on each member's availability. In addition, caving activities in the Province of Marinduque were put on hold due to the earthquake occurrence last July 27, 2022. This is in consideration of cave safety protocols and to avoid unwanted incidents with the public on cave activities. It was agreed that caving activities may resume by late October and thus, the rectification of gathered data for the cave map was continued. The complete map is yet to be submitted by this Office after its finalization with the newly acquired data.

The Labao Cave is situated within a private land, and though the owners were not present during the activity, the Barangay Officials were mostly accommodating to assist the team in the assessment. The cave is a multi-level type and is composed of 11 chambers, including the sub-chambers and there are 41 stations covered during the assessment. There are still unexplored parts of the cave. Thousands of bats were observed and recorded during the assessment, which are identified as either fruit bat or insect bat. Usual faunas such as whiplike scorpions, spiders, crickets and swiftlets are also found inside the cave. Speleothems such as stalactites, stalagmites, columns and flowstones are present inside the cave. Because of the bats living inside the cave, it is also rich in guano deposits.

With the presence of rich biodiversity inside the cave and its accessibility to the public, the PCAT recommends that Labao Cave is under the classification of Class II – Guided Tourism. Please see attached Enhanced Assessment Form for your further reference.

For information, record and further instruction.

DOREEN R. MASCAREÑAS

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PCAT Member

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Biodiversity Conservation Unit

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Monitoring and Enforcement Section

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MICHAEL JOSEPH MARANAN Monitoring and Enforcement Section

SHERWIN VILLAVICENCIO
Protected Area Management Office

ROBERT JOHNSON N. LARGA Support Staff

ENHANCED ANNEX B CAVE ASSESSMENT FORM

Name of Compiler:	PCAT Marinduque		
Date compiled:	November 28, 2022		
Name of Cave:	Labao Cave		
Region:	MIMAROPA	Province:	Marinduque
Municipality/City:	Mogpog	Barangay:	Sayao
Sitio/Purok:			
Size of the Area:	ha (area enclosed by the proposed	boundary)	
Period of Assessment:	*May 12 to November 25, 2022		

I. GENERAL INFORMATION

1. Evolution of the Cave

Labao Cave is a system found within the limestones slopes of Barangay Sayao. Mogpog. The entrance is located in a slope titled in the northeast direction. It is formed mainly within the Limestone Member of Torrijos Formation. Torrijos Formation is classified as reefal lenses intercalated with volcanics that trend northwesterly as has been in consonance with the major structure of the island province. The Limestone Member composed of reefal limestone and sandstones overlays the Volcanic Member of essentially andesite to basalt flows and agglomerates with minor intercalated clastics. The presence of corals in these rocks means that they have initially deposited and form below sea level. During the Middle Miocene, a major intrusion of a large body of northwesterly diorite batholith occurred in the middle portion of the island province. This tectonic event may have resulted in a localized uplifting and tilting event. At the same time a global cooling event known as the Middle Miocene Climate Transition, resulted in the lowering of global sea levels. These events led to the uplift and exposure of the limestone body to groundwater starting the dissolution process and eventual cave formation. At present day, beds of sandstones and conglomerates/agglomerates within the cave have northwest strike are dipping in 30-35 degrees in the northeastern direction. A similar trend is also observed in the contact of the overlying coralline limestone body and the coral platforms exposed outside of the area. Many of the chambers and passages inside the cave also follow a similar trend reflecting the initial conditions of the cave formation. The gradual dissolution and expansion of fractures, bedding planes, and/or unconformities within the limestone body.

2. Geographic location and description

Coordinates:	13°31'12"N, 121°54'45"E	
Elevation:	277 masl	
Land Status (plea	se check)	
Agricultur	al	Timberland
Mineral la	and	Residential Others (specify)
National R	Park	

^{*}Caving activities were put on hold from August to October, 2022

3. Accessibility

Labao Cave is situated on the karst area of Municipality of Mogpog, facing Tayabas Bay. Located in Barangay Sayao, it is accessible via public utility vehicle with scheduled trips from the town proper in 45 minutes to 1 hour. Private vehicles can also be used for faster conveyance by means of the concrete service road from the national highway. From the town proper going to Barangay Hall of Sayao, it will take up to almost 14 kilometers; 6.6 kilometers from the national highway; 16 kilometers from Balanacan Port, and almost 19 kilometers from the Municipality of Boac. Since the cave is within the private lands of Labao Family, it is best to coordinate with the Barangay Officials of Sayao for proper assistance to reach the cave.

4. Climatological data

Barangay Sayao is under the Type III climate, which has no very pronounced maximum rain period, with a short dry season lasting only from one to three months, either during the period from December to February or from March to May. This climate type resembles Type I since it has a short dry season.

5. Existing land-use patterns in area adjacent to the cave.

LISTING BY TYPE	AREA (ha)				
LISTING BY TYPE	Adjacent to cave	Above the cave			
Reforestation area	None	none			
Reservation	None	None			
Logging	None	None			
Grazing/Pasture	None	None			
Settlements	None	None			
Mineral Extraction	None	None			
Others	Agricultural	Agricultural			

6. Demographic Information

Name of Barangay	Number of Household	Barangay Population	Number of families	Means of Livelihood
Sayao	356	1,417		Employment, Farming, Fishing, Online Teaching

Source: Philippine Statistics Authority 2020 Census Population

7. Uses / Human Activities

7.1 Identify the current activities inside the cave

Type of Activity	Implementation period	Station/s Covered*	Implementing Agencies/Orgs.	Remarks
None	None	None	Not applicable	No current activities were observed/seen inside the cave

^{*} Refer to station in the cave map

7.2 Identify past uses/ activities

Type of Activity	Implementation period	Station/s Covered*	Implementing Agencies/Orgs.	Remarks
Excavation	undated	Stations 1, 6D and 6E	Local	Large diggings
Recreation	undated	Stations 1,	Local	With presence of graffiti

^{*} Refer to station in the cave map

8. Physical Features

a. Cave Map

Labao Cave has a total length of 232 meters, from the entry point to the exit point, including the looping passages and sub-chambers. The opening of the cave entry 1.85 meters wide and 4.15 meters high. Its average ceiling height is 2.78 meters. The floor is generally composed of mud and massive rocks. There are also guano deposits found on every level of the cave, mostly in the third level. Speleothems such as column and stalactites can also be seen on the first chamber in the first level and various chambers in the third level. There is no sign of water source within the cave but drippings are present in the fourth level which was not yet included in the assessment.

b. Status of the Cave

- b.1 () Pristine Cave (virgin or newly discovered cave; immensely decorated)
- b.2 () Intact (State what probable factors could have worked for their protection)
 - () difficult access
 - () within protected area
 - () inside private property
- b.3 (✓) Vandalized Yes. From Station 1 in the first level, names are scribbled on the wall.

 Graffiti are also seen in the walls in Stations 6D to 6G.
- b.4 (✓) Exploited Yes
- b.5 (✓) Claimant with claimants
 - Heirs of Labao
 - According to the locals, the heirs are not residing in the Philippines anymore
- b.6 (✓) For status not included in the criteria
 - Stations 6 to 10I are undisturbed and guano deposits are still intact.

II. NATURAL FEATURES

1. Vegetative Cover (Surface; inside cave; enumerate plant species)

1.1 Flora outside the cave

Local Name	Scientific Name	Uses	Importanc e/ Value	Conservation Status*	Stratification **	dbh	Remarks
Lipa	Dendrocnide meyeniana	Medicinal	none	Not evaluated	Under story		Found above the entry point
Dao	Dracontomelon dao	Culinary/ Folkloric		Vulnerable	Emergent		Found near the exit point
Balete	Ficus benjamina	Ornamental		Not evaluated	Canopy		Found on the surface above the cave boundary
Dapdap	Erythrina variegata	Medicinal		Least concern	Emergent		Found near the exit point
Tibig	Ficus nota	Medicinal		Least concern	Understory		Found above the entry point
Tibig	Ficus septica	Medicinal		Least concern	Understory		Found above the entry point
Kawayan tinik	Bambusa spinosa	Material		Least concern	Understory		Found on the surface above the cave boundary
Monstera	Monstera deliciosa	Ornamental		Least concern	Understory		Found near the opening of the cave
Ferns	Tracheophyta	Ornamental		Least concern	Understory		Found near the opening of the cave
Nito	Lygodium circinnatum	Ornamental		Least concern	Understory		Found along the way to the cave
Coconut tree	Cocos nucifera	Multiple use		No status rank	Emergent		Found on the surface around the cave opening
Usiw	Arthrostylidiu m spp.	Multipurpo se		No status rank	Understory		Found near the opening of the cave

^{*}Based on DAO 2007-01 or succeeding amendments

1.2 Flora inside the Cave (entrance to twilight zone)

Local Name	Scientific Name	Uses	Importance/ Value	Conservation Status*	Stratification	dbh	Remarks
None	None	None	None	None	None	None	None

^{*}Based on DAO 2007-01 or succeeding amendments

^{**}Emergent, canopy, understory, forest floor, etc.

2. Fauna

2.1 Fauna inside the cave (enumerate species):

a. Vertebrates

Scientific Name	Common Name	Abundance (range)	Location (station #)	Conservation status*	Remarks
Megachiroptera spp.	Fruit bats	0-50	5,6, 6F	Least concern	Flying inside
Gekko gecko	Tokay gecko	3	1	Other threatened species	Eggs only
Platymantis spp.	Frog	1	1, 2A	Vulnerable	Alive
Hipposideros sp.	Insect bats	0-100	6A-1,6B, 6C, 6D, 10, 10A, 10B, 10H-2, 11,12, 14	Least concern	Roosting season
Aerodramus mearnsi	Swiftlets	0-50	1	Least concern	Breeding

^{*}Based on DAO 2004-15 or succeeding amendments

b. Arthropods and other invertebrates

Scientific Name	Common Name	Abundance (range)	Location (station #)	Conservation status*	Remarks
Rhaphidophorida e spp.	Cave cricket	0-500	2A, 2C, 5, 6, 6B, 6F, 10A, 10B, 10D-10I, 10H-1, 11,	Not evaluated	alive
Damon diadema	Whiplike scorpion	0-500	2A, 2C, 6F, 6E, 7, 10, 10A, 10C, 10F,10H, 10H-2, 14, 15,	Not evaluated	alive
Gastropoda spp.	Gastropods	0-100	2A, 2D, 2F, 3, 4, 6B, 6C, 9, 10H-2	Not evaluated	Empty shells; small shells with alive slug inside
Formicidae spp.	Ants	0-1000	2A	Not evaluated	Crawling in the guano deposit
Araneae spp.	Spiders		2A, 6F, 8, 10B	Other threatened species	Seen on the floor and walls
Dardanus calidus	Hermit Crab	1	2A	Critically endangered	Mostly alive, 1 dead found
Scarabaeidei sp.	Dung beetle	1	13		
Pholcidae spp.	Long-legged spider	1	13		

^{*}Based on DAO 2004-15 or succeeding amendments

c. Guano characterization

Sample #	Species (e.g. fruit bat, insect bat, swiftlet)	Location (station #)	Depth	Area (m²)	Physical Characteristics (e.g. texture, consistency, dry or wet)	Relative age (old or new	Other observations (presence of feathers, plant fibers)
1	Insect bat	6	2 cm	1	moist	new	With fungi
2	Insect bat	6A-1	1 cm	1.5	Moist	new	
3	Insect bat	6A	1 cm	4.5	moist	new	With dead spider
4	Insect bat	6B	1 cm	1	moist	old	
5	Insect bat	6C	1 cm	1	moist	old	With roots
6	Insect bat	6D	1 cm	1	moist	old	With roots
7	Insect bat	6E	1 cm	1	dry	old	
8	Insect bat	6F	1 cm	1	dry	old	
9	Insect bat	6G	1 cm	1.5	dry	new	With roots
10	Insect bat	7	1 cm	1	moist	old	With fungi
11	Insect bat	8	2 cm	2.5	moist	old	With fungi; Bird's feather was found
12	Insect bat	10	3.5cm	80	Moist to dry	new	With fungi
13	Insect bat	11	2 cm	10	dry	old	With fungi
14	Insect bat	12	3 cm	1	dry	old	With fungi
15	Insect bat	13	2.5cm	1.5	dry	old	With fungi
16	Insect bat	14	2cm	2.5	dry	old	With fungi
17	Insect bat	15	2 cm	1	dry	old	With fungi

2.2. Fauna outside the cave.

Scientific Name	Common Name	Abundance (range)	Location (station #)	Conservation status*	Remarks
Rhipidura nigritorquis	Maria Capra	0-50	n/a	Least concern	Seen perching on a branch
Haliastur indus	Lawin/Brahminy Kite	1-5	n/a	Least concern	Seen flying
Nymphalidae spp.	Butterfly	1-10	n/a	Critically endangered	seen
Pteropus spp.	Fruit bat	1-10	n/a	Vulnerable	seen
Hipposideros sp.	Insect bats (mistnetting)	500 – 1,000	n/a	Least concern	Captured for identification and released
Aerodramus meamsi	Swiftlets	0-10	n/a	Least concern	Captured and released for identification purposes

^{*}Based on DAO 2004-15 or succeeding amendments

3. Geology

3.1 Speleothems inside the cave.

Speleothem	Approxim	Z	one	Remarks
	ate No.	Twilight	Dark	
Dripstone and Flowstone Forr	ns (gravity cor	ntrolled)		
Stalactites	300-500	/	/	
Stalagmites	50-100	/	/	
Draperies	100-200	/	/	
Flowstone Sheets	50-100	/	1	
Columns	50-100	/	1	
Others				
Erratic Forms (crystal growth	controlled)			
Shields	None			
Helictites	None			
Botryoidal Forms (popcorns, grapes, etc.)	50-100		/	
Anthodites	none			
Oulopholites (gypsum flowers)	none			
Moonmilk	none			
Others	none			
Sub-aqueous				
Rimstone dams (gour pools)	none			
Concretions of various kinds (limestone concretions e.g. cave pearls, iron, basalt)	50-100	/		
Pool deposits	none			
Crystal Linings	none			
Others	none			

3.2. Mineral deposits inside the cave.

Minerals	Location (station #)	Remarks
Aragonite	-	
Calcite	All throughout the cave	
Dolomite	-	
Huntite	-	
Hydromagnesite	-	
Magnesite	-	
Others	-	

3.3. Other geological features inside the cave.

- No other geological features were found inside the Labao Cave.

Features	Location (station #)	Remarks
Faults		
Joints		
Cracks		
Fossils (paleontological feature)		
Others		

4. Hydrology

4.1 Hydrological features inside the cave.

Facture	Location	F	low	0	rigin	Size/	-U	Tempera	Damarka
Feature	(station #)	Perennial	Intermittent	Natural	Man-made	Volume	рН	ture	Remarks
None	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

^{*}for rivers, indicate direction of flow relative to the entrance. Indicate location and reference points.

4.2 What are the hydrological features outside the cave?

Feature	Location (station	Flow		0	Origin Sizel		рН	Tempera	Remarks
	#)	Perennial	Intermittent	Natural	Man-made	Volume		ture	
river	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Characterizati ons are unidentified since the river is dry

5. Cave Hazards. Please indicate if any of the following are present. Please indicate location inside the cave.

Cave Hazards	Location (station #)	Remarks
bad air* (from guano, poor air circulation, low supply of oxygen)	none	
presence of swiftly running underground river system	none	
deep sumps or pools	none	
flooding indications	none	
vertical pitches/entrances	0 to 1, 2 to 3, 4 to 5, 9 to 10, 10A to 10B	
tight crawl ways/squeezes	2E, 2F, 2G, 15	
presence of rock fall	1, 2, 3, 4, 5, 6	
Cavern roof collapse	none	
deep mud	none	
unstable flooring	none	

Sharp rocks	none	
Spalling**	none	
Heaving***	none	
Extremely cold temperatures	none	
Others – Flash flood	none	
Others – Slippery	4 to 5, 6A, 10A to 10B	
Others – Drop	5 to 6	

^{*}refers to the condition of air in caves characterized by low levels of oxygen, high levels of carbon dioxide and other hazardous gases such as methane. Low levels of oxygen and high levels of carbon dioxide in caves or certain cave passages pose dangers to the human body. Bad air is indicated by hyperventilation, increased heart rate, dizziness, dry acidic taste in the mouth, increased pulse rate, labored breathing, and headache. Annexes C to E provides general information on the relationship between caves and levels of CO₂ and O₂.

III. ANTHROPOLOGICALFEATURES

Are there indigenous peoples (IP's) or settlers living within the general location? If yes, then specify the name of the IP and other information listed below.

 There are no indigenous people or settlers near/around Labao Cave or within Barangay Sayao.

IP	Approximate Population	Livelihood Activities	Traditional Uses/ Cultural Activities
none			

IV. ARCHAEOLOGICAL FEATURES

Are there artifacts and/or ecofacts on the present floor area of the cave, rock shelter or overhang?

✓Yes None ____ If yes, indicate location/s (station #/chamber)

Shell middens were found inside the Labao Cave.

Artifacts	Location (station #)	Remarks
Stone tools (flaked)		
Stone tools (polished		
Shell tools		
Tradeware ceramics		
(porcelain, stoneware		
Pottery (earthenware)		
Pottery (earthenware with designs)		
Metal implements		
Wooden coffins		

^{**}refers to breaking down or chipping off of rock faces/surfaces due to stress

^{***}refers to a process where cracks form in the rock due to subsidence

Ecofacts		
Fossils		
Human bones		
Animal bones		
Wood		
Shells (land)	Station 1	
Shells (freshwater)		
Shells (marine)		
Artworks		
Charcoal drawings		
Hematite paintings		
Engraved artwork		
Others		

V. THREATS, PROBLEMS AND POSSIBLE SOLUTIONS

Threats/Problems	Current	Potential	Possible solutions	Remarks
Deforestation		/	Reforestation	
Agriculture	1		Sustainable farming	
Urbanization		1	Policy, Land Use Plan	
Industrialization	None	none		
Tourism and Recreation		1	Management plan; IEC on Sustainable Cave Management	Cave ecology may be disturbed by human activities
Chemical Waste	none	none		
Water Exploitation (dams, groundwater pumping, inundation)	none			
Treasure hunting	none		Law Enhancement (Cave Act)	
Used by insurgents	None	none		
Others	None	none		

VI. POTENTIAL USES OF THE CAVE

Potential Uses	Remarks
Scientific Research	Study of Cave Biodiversity; Physico – Chemico Studies inside the cave; Archaelogical Studies
Tourism and Recreation	Guided tourism
Exploration	For further exploration
Others	Cultural mapping and historical resources

VII. RECOMMENDATIONS

The PCAT – Marinduque recommends that the cave is under the classification of Class II – Guided Tourism.

Considering that Labao Cave is situated within private land, a Memorandum of Agreement (MOA) between DENR-LGU-Private land owners shall be signed in reference to DENR-PAWB Technical Bulletin No. 2013-05. A management plan may be prepared in collaboration with the LGUs, academes and other government agencies to sustainably managed, conserve and protect the cave.

Prepared by:

Assessment Team Members

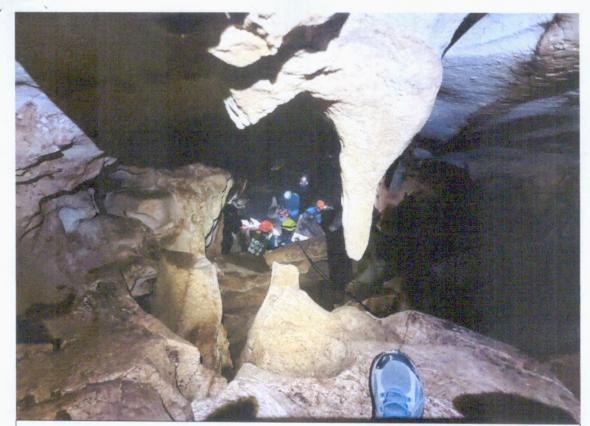
Doreen R. Mascareñas, Ph.D. / School of Agriculture, Marinduque State College / 09673067582 Ronald S. Atienza / Administrative Aide VI/Staff, MDRRMO – LGU Mogpog / 09178203226 Dante L. De Luna / Economist II / PG-ENRO / 09776694435 Randy R. Pantoja / Forest Technician I / PENRO Marinduque / 09062820192 Corazon R. Pelaez / Forest Technician I / PENRO Marinduque / 09150514266 Robert Johnson N. Larga/Technical Support Staff/PENRO Marinduque / 09277387148 Don Gibson D. Mercado / Forester I / PENRO Marinduque Alvin S. Pergis / Ecosystems Management Specialist II / PENRO Marinduque (PAMO) Michael Vencint M. Sualog / Forest Technician I / PENRO Marinduque Michael Joseph A. Maranan / Forest Ranger / PENRO Marinduque Sherwin P. Villavicencio / Forest Ranger / PENRO Marinduque (MGB) / 0997554657

Concurred by:

IMELDA M. DIAZ

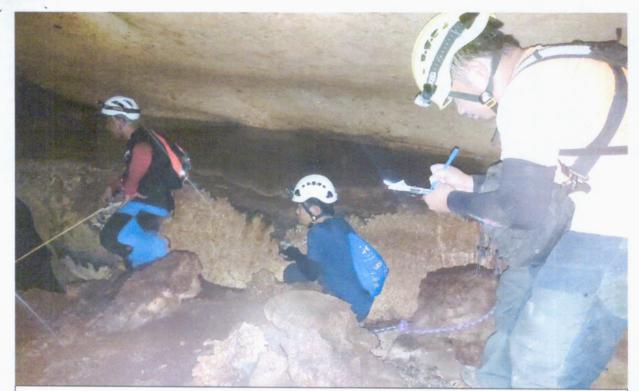
Chairperson, Provincial Cave Committee

PHOTOS TAKEN INSIDE THE LABAO CAVE DURING ASSESSMENT

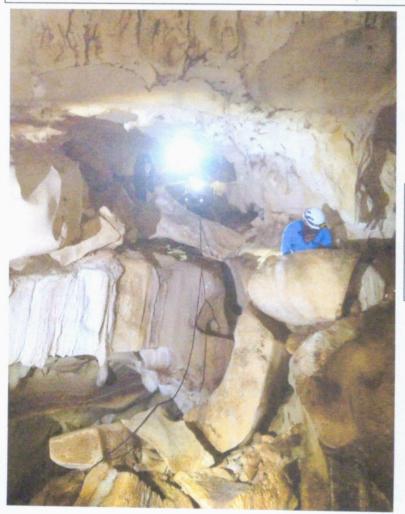


Picture taken during the descend of the assessment team to the third level of the Labao Cave



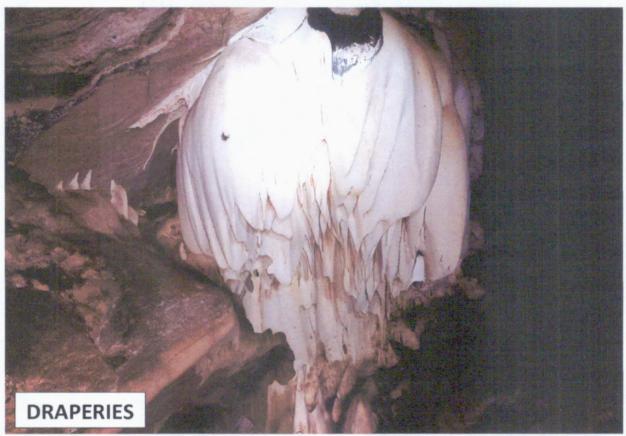


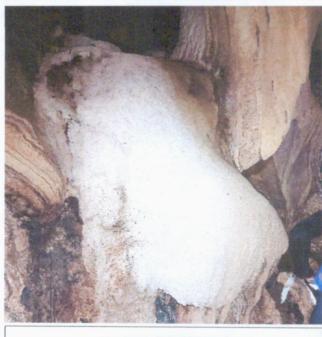
The team during the measurement of angle, orientation and distance between identified stations within the cave; in the photo are the tape 1 holder, clinometer and compass reader, and the recorder/cartographer



Members of the assessment team while descending from the second level of the cave down to the third level, using the cave rope; with rock collapse on the bottom

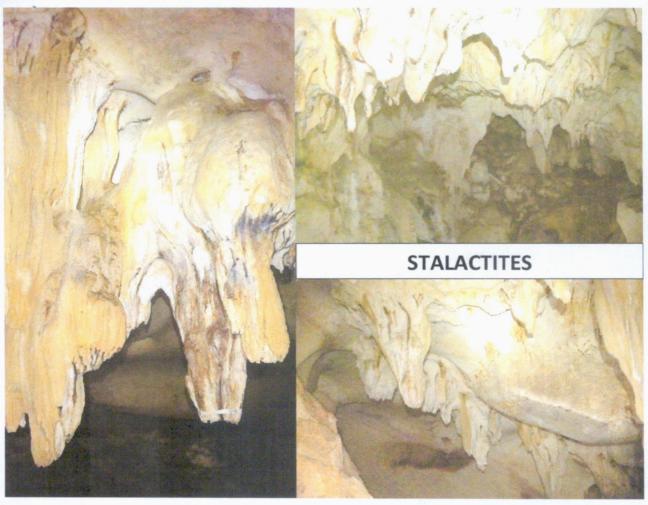
SPELEOTHEMS FOUND INSIDE THE CAVE



















Platymatis spp. found in Chamber 1, Sta. 1

