



THE DEATH CORAL CAVER

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THE DEATH CORAL CAVER
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The Death Coral Caver is published by the Proyecto Espeleológico Purificación. The PEP is dedicated to the study and exploration of the caves and karst of the Purificación Karst region in the states of Nuevo León and Tamaulipas, México. Articles from *The Death Coral Caver* may be reproduced in other non-profit publications with proper attribution. Any material relating to the Purificación karst is welcomed for publication.

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Project website: <https://pepcaving.org/>

Front Cover: Colin Magee descends from the Infiernillo entrance.
 ALEX SEATON

Inside Front Cover: Barbara Luke lights up the Río Verde on a supply run to Camp VII, Sistema Purificación.
 ALEX SEATON

Inside Back Cover: Abigail Mack loaded with essentials at Las Chinas.
 PETER SPROUSE

Back Cover: Osama Gobara in Brinco.
 ALEX SEATON

EDITORIAL

We are very pleased to present the first issue of the Death Coral Caver since 2009. Issue number 1 of our project publication came out in 1991, and has captured nearly all exploration in the area since then. It's an important record that helps to guide continuing exploration. Following a ten year exploration hiatus, when project cavers were busy elsewhere, issue 15 starts catching up on the many explorations which resumed in June 2019. There have been new deep caves found, three underground camp trips, and the exciting ascent to Cueva Vista Maxima.

So much cave exploration remains to be done in the project area. There have been over 2000 entrances located so far, many of them yet to be explored. The study area the project has delineated (see DCC 10) is over 6000 square kilometers in area. The elevation range of the Purificación karst is 3263 m, starting at 300 m where the Río Guayalejo leaves the mountains to 3563 m on Picacho San Onofre – which we haven't even been to the top of yet. The area is unique in its vastness and at the same time, accessibility. I look forward seeing what lies ahead.

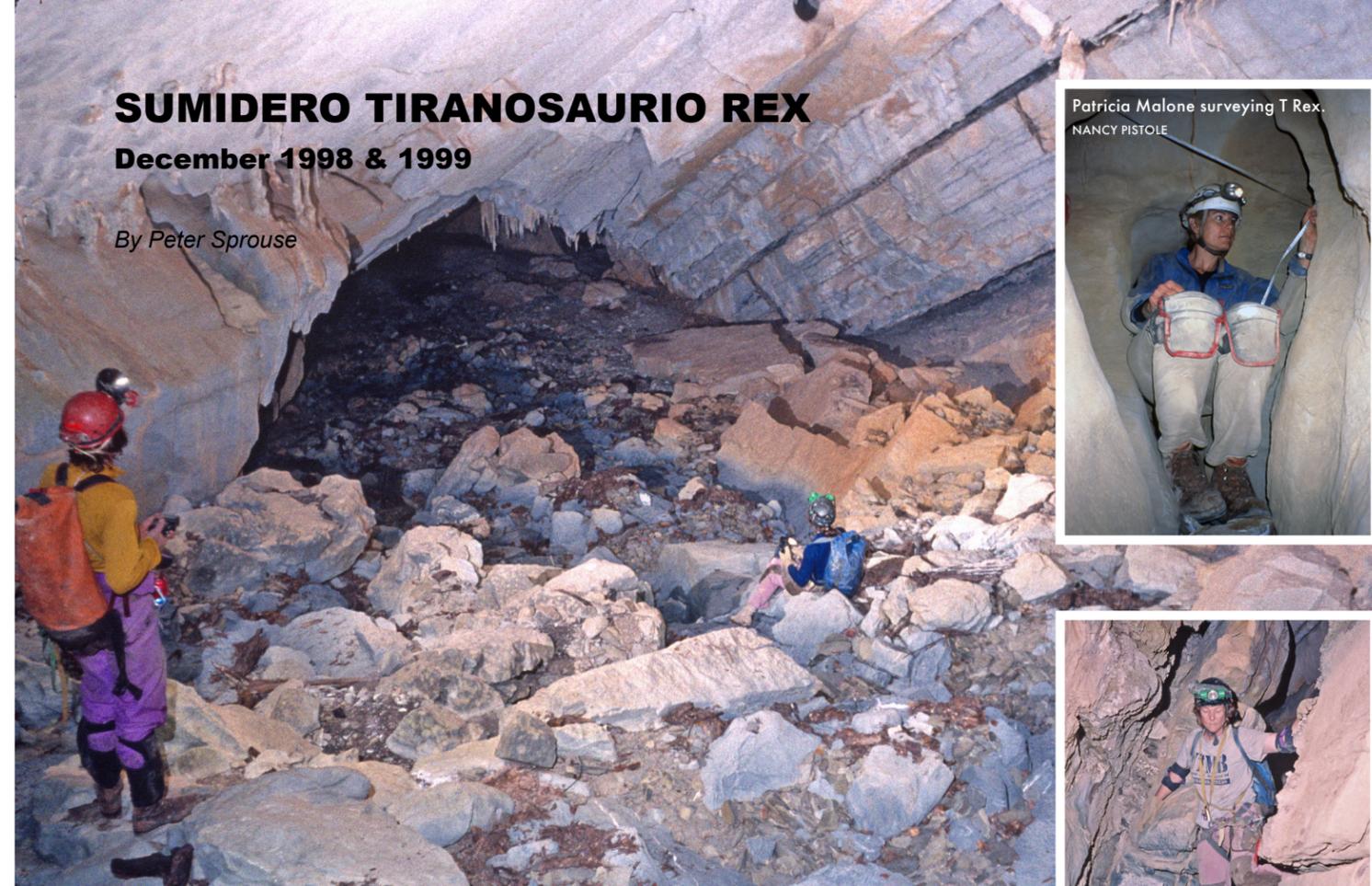
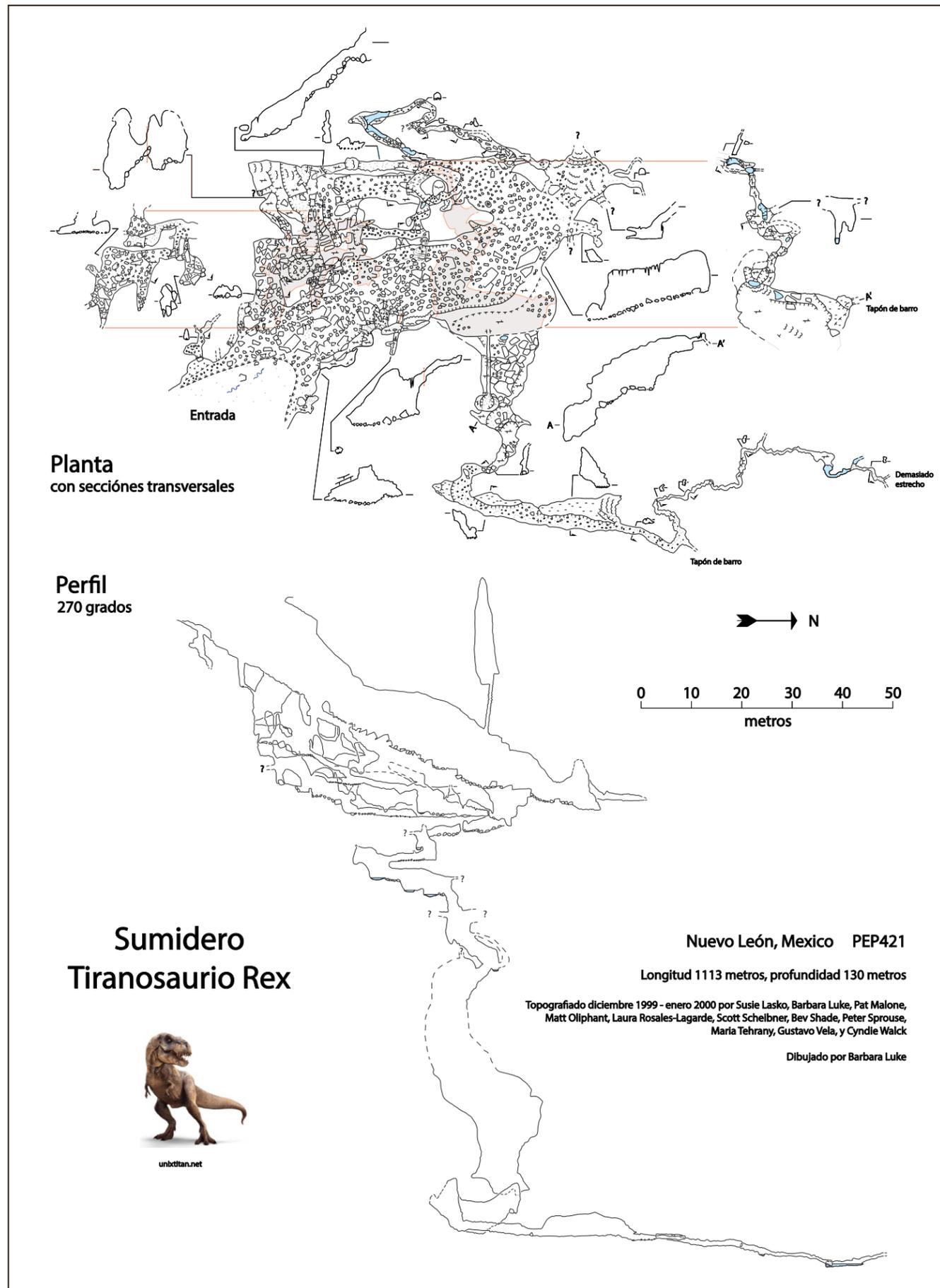
Peter Sprouse



Peter drafting maps.
 DAN GREEN

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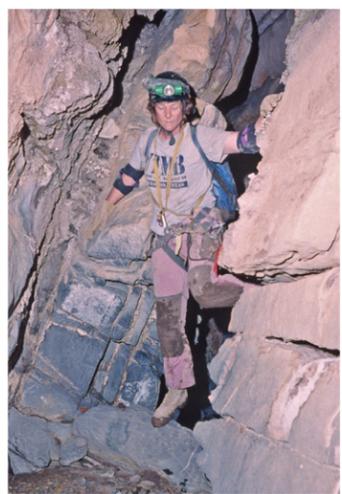
SUMIDERO TIRANOSAURIO REX

December 1998 & 1999

By Peter Sprouse



Patricia Malone surveying T Rex. NANCY PISTOLE



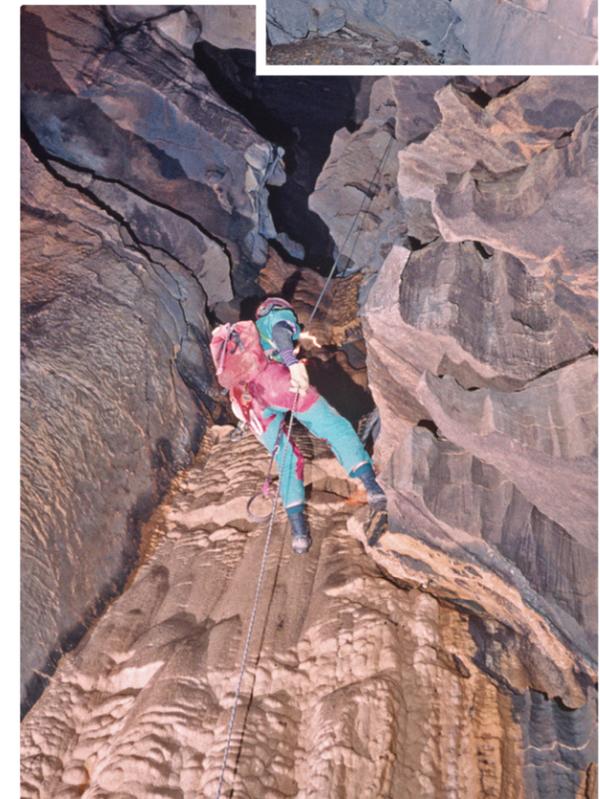
Susie Lasko (right) and Cyndie Walck (below) in T Rex. PETER SPROUSE

Matt Olliphant and Susie Lasko in the T Rex entrance borehole. PETER SPROUSE

THE DECEMBER 1998 expedition to Cretaceous Park resulted in the exploration of many major stream caves located along a shale/limestone contact. These stream sinks had been detected using stereo pairs by Peter Sprouse. Working their way north along the contact on 31 December, Barbara Luke, Bill Mixon, and Peter followed an incised shale arroyo down to a surface drop into the large entrance to Sumidero Tiranosaurio Rex. On that day they explored about 100 meters of complex walking passages with air, and the cave was going good.

On New Years Day seven cavers made the hike back to the cave in a fast 1:20. Maria Tehrany, Barbara, and Peter mapped 23 stations in the entrance passage, while Bernhard Koeppen checked ahead down the main drain. He came back breathless and excited, having fallen down the first climb. He proclaimed "It's a Bosch cave!"

On 20 December 1999 Barbara, Peter, Susie Lasko, Patricia Malone, Matt Olliphant, Scott Scheibner, and Cyndie Walck returned to T Rex. Matt and Peter rigged down 5 drops while the others surveyed behind. They got to a gravel belly crawl which they trenched for 5 m. Then it changed to a narrow meandering bedrock tube which Peter pushed for 40 m, and it continued with air. The others surveyed to the crawl. On 22 December Barbara, Cyndie, Laura Rosales, Bev Shade, and Gustavo Vela went back, mapping the entrance loop and pushing the bottom tube to a pinch.





GARZA & LA ESCONDIDA

June 2019

By Bev Shade

WE PACKED UP on Friday, June 21 and drove to Laredo. It was a late night and an early morning. There was a pretty significant line and a lot of people needed papers, so we didn't get out of the Aduana until 10:30 am. Isabel Grajales kindly brought Lili from Monterrey out to the bypass around Saltillo which saved us a lot of time. We got to Aramberri at 8 pm. That night was a very dramatic and unseasonable thunderstorm. That's foreshadowing, by the way.

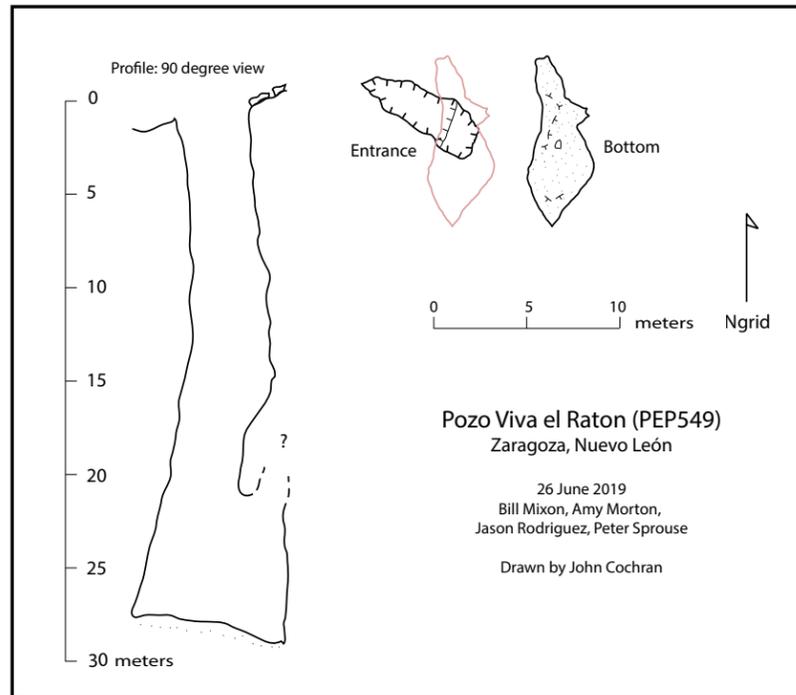
The next day was clear and beautiful, and a great day for four wheeling. We passed La Escondida on Cerro el Viejo, then took the east turn toward Garza. There's only 1 house left there, with a man and his son who were taking care of the cows for the landowner. The road had some very muddy sections where it runs across shale outcrops and the water doesn't drain. Le Fierra (Tom's truck) got stuck once, but overall we got to our first camp unscathed. Our camp was at the lovely spring called El Paraíso. We started setting up extra tarps right away, since there was more rain in the forecast. There was lots of poison ivy, as we had lost a lot of elevation after passing El Viejo. This worried me a little, since Ollie had come with me and I did not relish the prospect of camping with a 9-year-old with poison ivy.

On Monday the 24th, we finally got to start exploring! We split into

several groups to look for potential sinks along a shale/limestone contact. We didn't find much: lots of shale plugging occasional may-be-features. We hiked down toward Cañada Agua until we ran out of time, but never really got out of the shale. So it seems like the shale/limestone relationship here isn't a simple stratigraphic one, but instead complicated by some messy faults. We left a few of Bill Mixon's ashes in a pretty streamsink. While most of the group enjoyed pools in this small canyon, a group comprised of Amy, Ron, Ken, and Matt set off on a hike to an air photo lead on a cliff on the north side of Cañon del Niño. It is difficult terrain, and they got cliffed out a few times but were able to see the lead. It was a real struggle, and Ron's comment was "I almost died".

They were able to assess and make a basic plan for a dedicated return effort, which took place in December of 2019 and led to the discovery of Cueva Vista Maxima. It was clear that this would take more time and resources than we had, and the continuing rain had us worried about the muddy road, so we opted to move camp the next day.

Tuesday the 25th was a long day of winching trucks out of endless mud puddles. We had torn up the steep road on the way in, and with each passing vehicle, it just got worse. I had the honor of being last, so I got to have the most fun. Tom's La Fierra, a mighty beast that carries many people and gear, was particularly challenged since it is so heavy and has

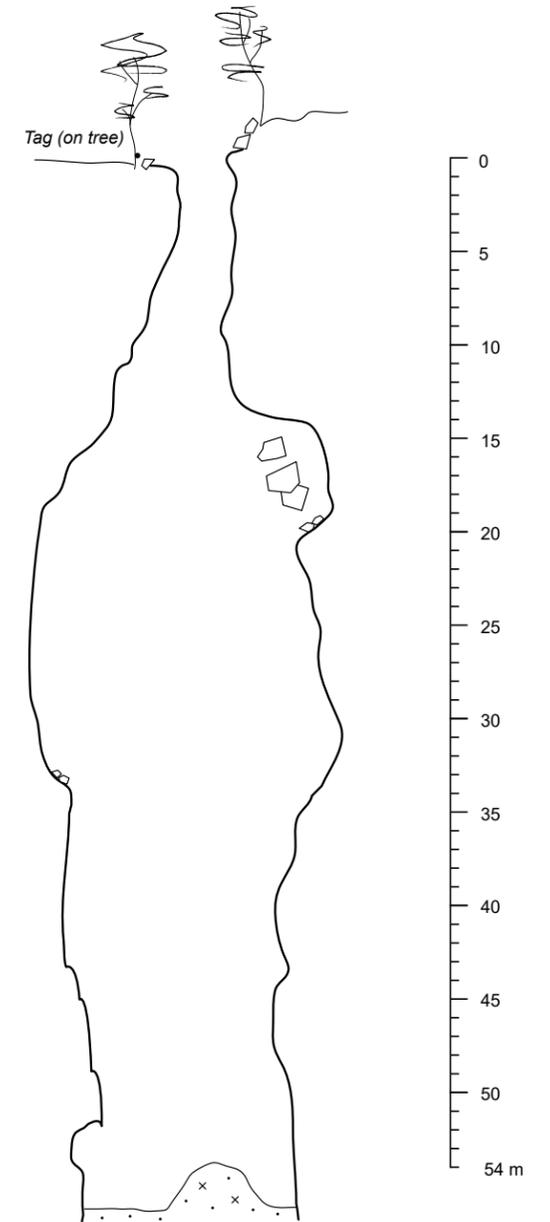


Cueva Pantin Colgado (PEP 595)

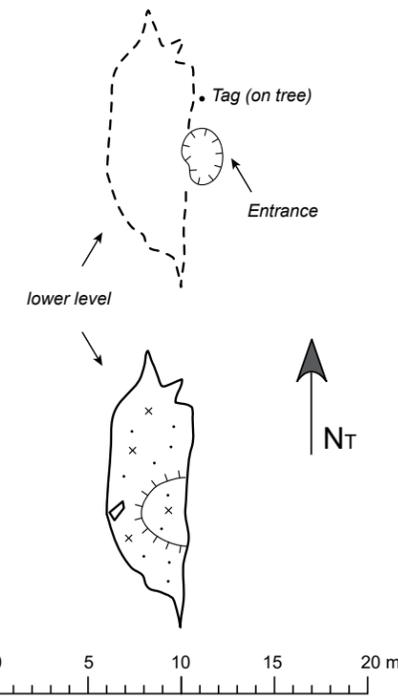
El Viejo
Nuevo Leon, México
Latitude 23.96768, Longitude -99.68558

Survey 26 June 2019 by
Cait McCann, Ron Rutherford, Matt Schram,
and Bill Mixon (en absentia)
Drafted by Bev Shade, October 2019
Length: 73 meters Depth: 54 meters

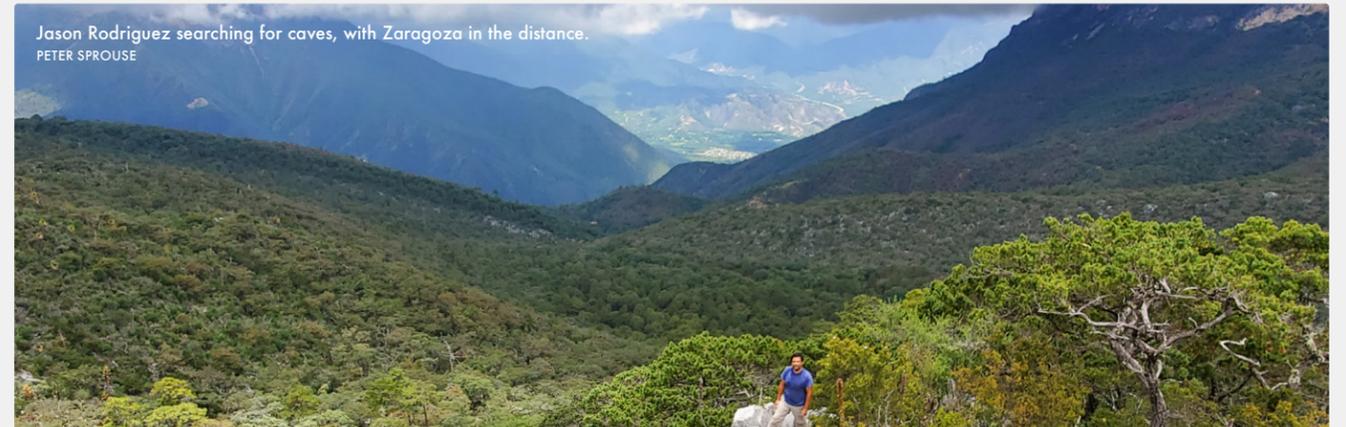
PROJECTED PROFILE 90°

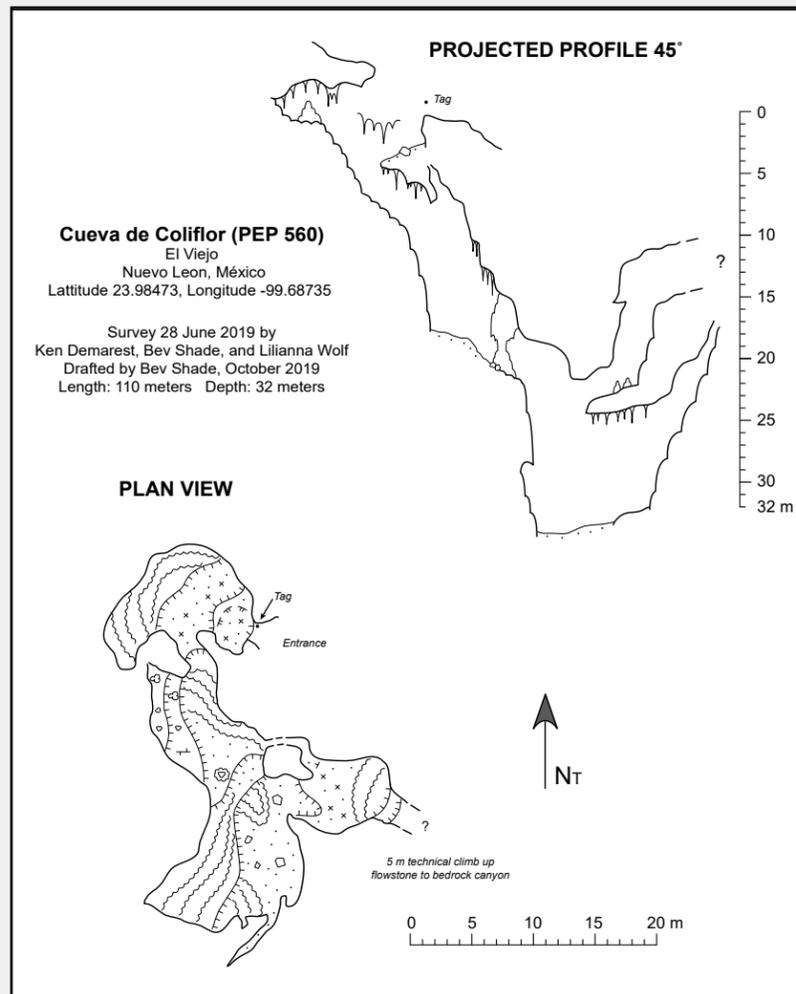


PLAN VIEWS



Jason Rodriguez searching for caves, with Zaragoza in the distance.
PETER SPROUSE





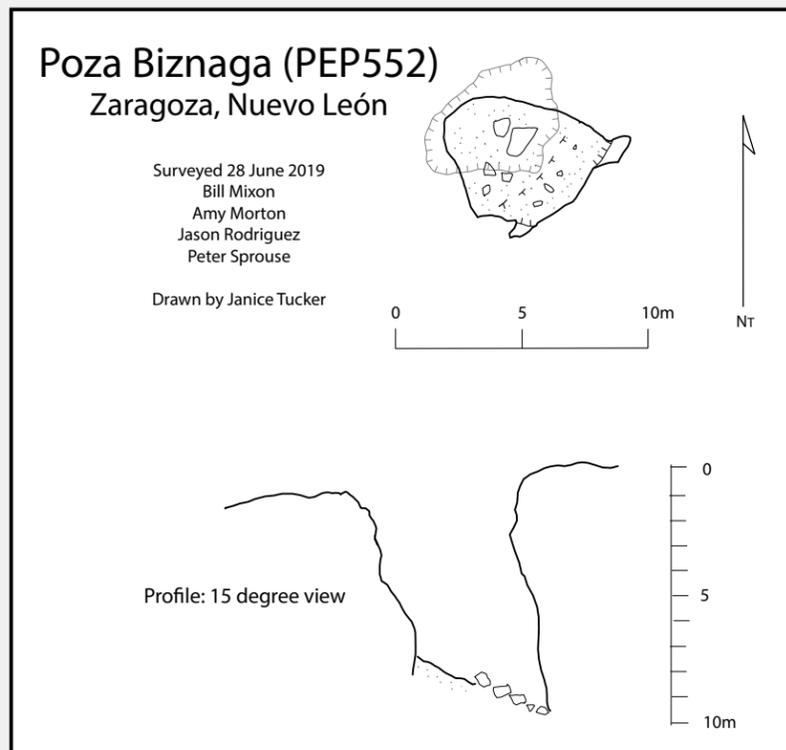
Bill Mixon's remains join the team in Pozo Viva el Raton.
 PETER SPROUSE



Amy Morton in Pozo Viva el Raton.
 PETER SPROUSE



Jason Rodriguez at Pozo Biznaga.
 PETER SPROUSE



L-R: Cruz St. Peter, Lilianna Wolf, Tom F. Rogers, Jason Rodriguez, Ron Rutherford, Ken Demarest, Cait McCann, Matt Schram, Cathy Winfrey, Bev Shade, Ollie Wilson, Peter Sprouse, Amy Morton
 JASON RODRIGUEZ



such a long wheel base. I learned a lot about winching. It took 8 hours to drive the few kilometers back to La Escondida, where we stayed for the rest of the trip. One family still lives in La Escondida, Javier and Rebecca. They generously let us camp in their meadow. The only flat spots around are of course big filled sinkholes. So, we had a few challenges keeping tents dry as the rain continued episodically.

On Wednesday the 26th, Ollie, Cathy, and I held down camp and tried to mitigate drainage around camp. The rest of the team went prospecting and found a few features. Actually, they found tons of features but since there have been several camps at La Escondida, most of the pits they saw had already been mapped. Cait, Ron, and Matt mapped Cueva Rayito del Solito. Peter, Amy, and Jason mapped Pozo Viva el Raton and Cueva Resbalada. Ken, Tom, Cruz, and Lili found a cave that we mapped a few days later.

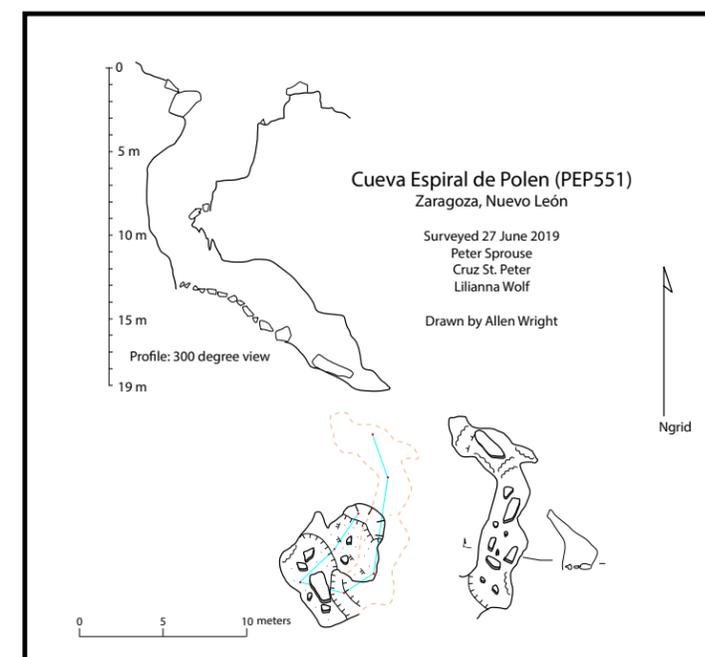
On Thursday, June 27, the whole group went southeast to scout a shale/limestone contact that showed a line of sinks in aerial photos. Apparently I had been there in 2005 for a few days. At that time, a fire had cleared most of the vegetation. The regrowth was short and dense – not great hiking. My team (Ollie, Ken, and Ron) went to an aerial photo lead that turned out to be a spring that rises diffusely out of a swamp, and eventually becomes a truly lovely stream flanked by great old trees that managed to escape the forest fire. Ollie and I made an epic fairy house while Ken and Ron searched for caves. Cait's team had worked laterally along the contact, and relocated Cueva de la Lavadora from the 2005 trip. By the end of the day, they also arrived at our pond and were grateful for a swim in the cool water. Peter's group dug on Cueva Espiral del Polen and mapped it. Matt and Cathy headed home this day. Another big rain event this night.

On Friday, June 28, most folks spent the day drying out their tents and working on drainage. Ken, Lili, Ollie, and I mapped a pit that his group had found 2 days earlier, Cueva de Coliflor. We left a climbing lead. It's very close to the surface and no significant airflow, not very exciting. We also left a few of Bill Mixon's ashes in this cave. Cait's team mapped Cueva Rayito del Solito. Peter, Amy, and Jason mapped Pozo Biznaga, Pozo de las Preguntas, and Pozo del Guiño Feo.

Saturday, June 29, our exploration time was already over! Most of the group drove to Bustamante. I took Lili to Monterrey and stayed there. On Sunday everyone returned to Texas.



Lili Wolf exploring a blowing lead in Chupaderos.
 PETER SPROUSE



CAVES MAPPED

TAG	CAVE NAME	LENGTH(m)	DEPTH(m)
549	Pozo Viva el Raton	31	25
550	Cueva Resbalada	12	9
551	Cueva Espiral de Polen	24	15
552	Pozo Biznaga	12	7
553	Pozo de las Preguntas	8	7
554	Pozo del Guiño Feo	48	45
560	Cueva Coliflor	110	32
594	Cueva Rayito del Solito	16	14
595	Cueva Pantin Colgado	73	54

FIRST EXPLORATION OF VISTA MAXIMA

December 2019

By Sean Lewis, Cruz St. Peter, Matt Schram, Peter Sprouse, Cathy Winfrey

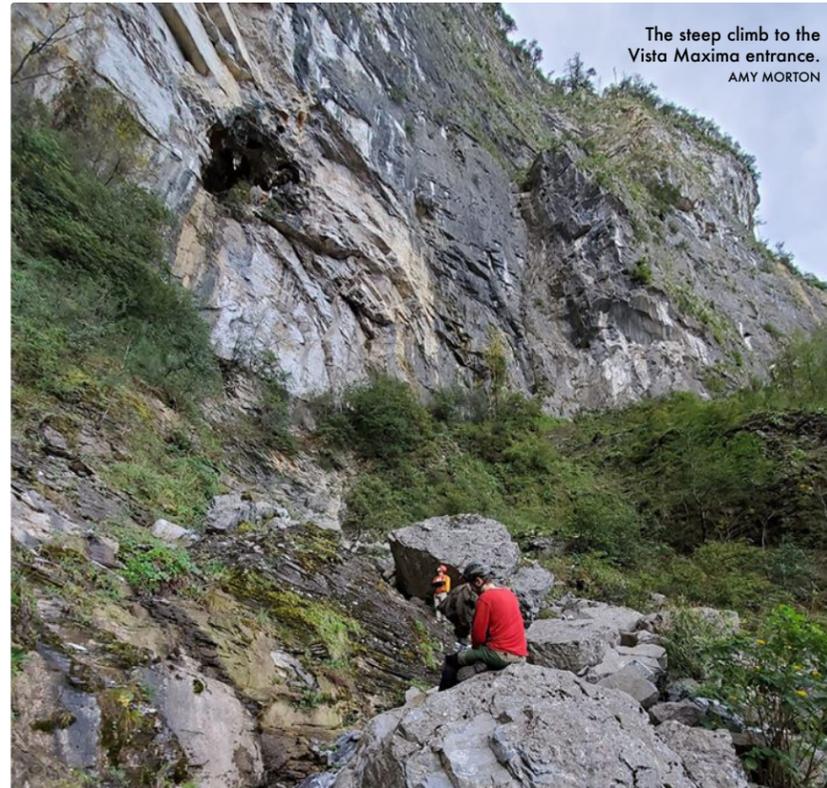
FOUR TRUCKS LEFT Austin for this 11 day trip to Zaragoza. Personnel included Peter Anderson-Sprecher, Ben Dau, Chelsea Dau, Ken Demarest, Wesley Havens, Juan Laden, Sean Lewis, Amy Morton, Tiffany Nardico, Marco Ramos, Matt Schram, Cruz St. Peter, Peter Sprouse, and Cathy Winfrey. They picked up Marco at his sister's house in Laredo and reached Potrero Chico at dusk. There they found Tiffany and Wesley at the climber's camp. Some Monterrey cavers joined them for the evening around the climbers' bonfire. Meanwhile Matt Schram's truck stayed at the border, and would catch up later.

The next morning (December 21) they drove south, stopping near Galeana to look at gypsum karst. They all piled into a hotel in Zaragoza and were joined late by Matt's truck. The next morning they awoke to an orange alpenglow bathing the morning chill. Looking up they could see a dusting of snow on Cerro el Viejo and surrounding peaks. The slow shuffle of early morning commenced as taco vendors and shopkeepers wrapped in jackets, scarves and hats went about their routines. After breakfast they hit the local tienda and stocked up on produce, eggs, and all manner of other necessary things.

With dry road conditions, the train of four Toyotas made quick work of the switchbacks up El Viejo. The drive up the mountain was beautiful. Oak trees, longleaf pines, and occasional fir trees were draped with Spanish moss, orchids, ferns and epiphytes. The mountainsides were carpeted in a green of lichens, moss and small plants, and punctuated by giant agaves gone to seed, their dried-up stalks reaching meters to the sky. The road was steep, the switch backs were sharp and the views grew better and better with every turn. They stopped the top of the grade at La Escondida, parking among a few small patches of snow. Here they divided into two teams for week one of the expedition. One group would head east to Dulces Nombres, while the others were going north to Garza. The Garza crew consolidated gear into Matt's truck.

After crossing the upper part of Infierno Canyon, the Garza crew faced a steep and rocky section with clay underneath. Momentum is key to driving the road here, balanced while not ripping off your suspension. Sean elected to ride standing on the bumper, and from the cab of the truck he could be seen swinging around and hollering like a rodeo cowboy. At one point they smacked a rock so hard that they had to stop and check the truck. The shock of hitting that rock was enough to end the rodeo on the bumper for Sean. He had nearly been thrown him off a couple times before that already. Passing Garza, they set up camp in a nice flat llano. They were greeted by a local perro, who was quite shy, but Amy was able to convince him that they meant no harm.

The goal was to approach and enter a cave that no one had been able to access before, as it was situated in a cliff face. Amy, Matt, Ken



The steep climb to the Vista Maxima entrance.
AMY MORTON

Demarest, and Ron Rutherford had made an attempt to get to the cave in June 2019. It became apparent on that trip that overnighting on the mountain in the remote valley below the cave would be required to get into that cave. That evening they sorted and packed supplies for the week. Some tested hammock setups to gauge overall warmth and comfort. These would be essential since there would not be much, if any, tent space at the cliff camps.

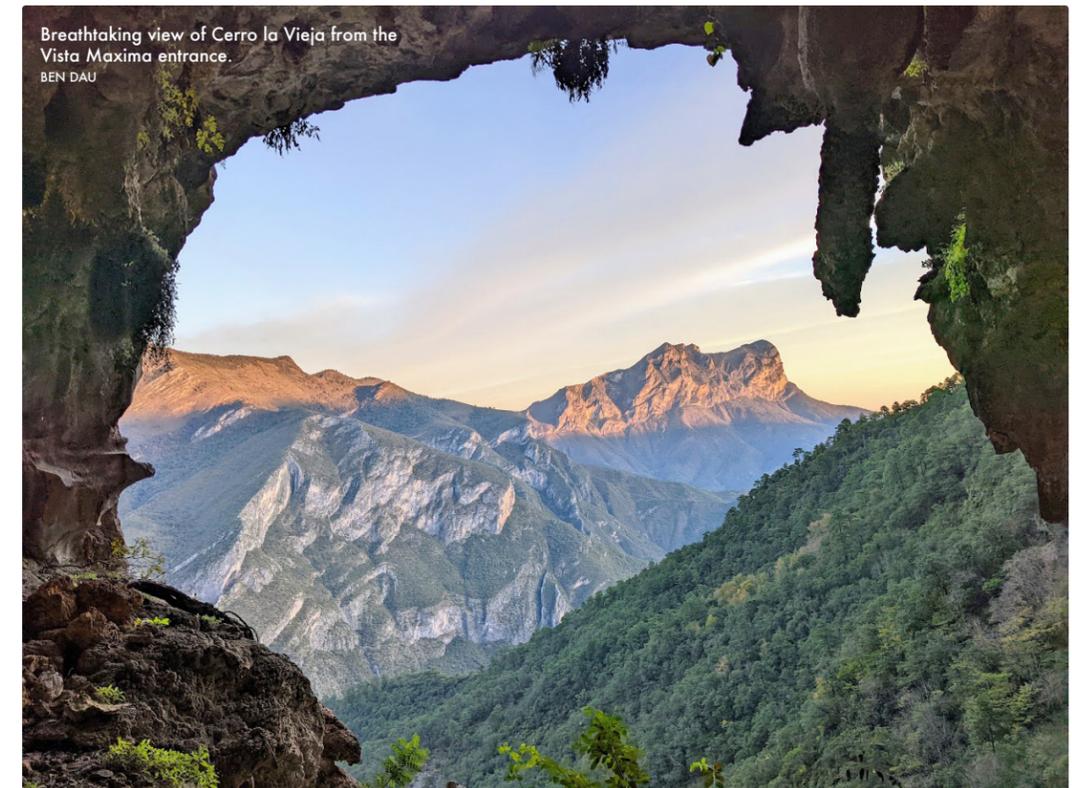
The next morning, December 23rd, the team set out to cross the ridge. Each had at least 60 pound packs with sleeping stuff, group gear, food and camp clothes. A very steep descent into the next valley was required, with unstable scree slopes and some ropework. They found a nearly perfect camping area on a big flat rock overlooking the river bed and valley below. The camp had enough flat spots for Amy and Sean to sleep on the ground, while Ben, Chelsea, Cruz and Matt picked trees to hang hammocks from.

It is difficult to describe the unique combination of awe and intimidation that they faced in this remote mountain valley the next day. As they climbed the arroyo from camp that would regularly run with raging water powerful enough to move house-sized boulders, they stared up at the giant entrance, with car-length stalactites hanging down like dragon teeth.

This climb to the entrance was reported to be about 30 m, with an impressive headwall several hundred meters above that. Indeed, the

massive cliff above the cave was like a wall from Yosemite, only this one made of limestone and hinting at a 3D labyrinth beyond. So then began the technical challenge of accessing this potentially vast cave system, from a remote mountain site that few had ever seen, and with tools that only the latest technology had created. Bill Stone had kindly provided some climbing gear and camp food from the US Deep Caving Team supplies.

A heavy Hilti TE30-36A hammer drill was used, which weighs about



Breathtaking view of Cerro la Vieja from the Vista Maxima entrance.
BEN DAU

6.5 kg. The speed of drilling and the fact that over 100 holes can be placed without changing a battery meant that there would be less things to deal with on the wall. They elected to bring a shorter length of dynamic rope and about 12 quickdraws, and accepted that there would have to be belay stations set up. They had some trad gear and aid hooks, but rarely got a chance to use them. The natural hook placements were on unstable flakes. They could have set holes for a bat hooks, but did not have good bat hooks in their toolkit other than the Black Diamond Talon, which isn't that great, and they did not want to risk falling. They used Yates adjustable daisies and fifi hooks to capture upward progress. The idea for the climb was to create a bolt ladder on stainless anchors the whole way up. They would leave the bolts and hangers in place in case the rope rigging did not survive or needed to be pulled, so that the climb could be quickly duplicated.

This wasn't going to be an easy cakewalk. They arrived at the start of the arroyo, which must be an entrance-emanating waterfall plunge pool in flood conditions. The approach to the base of the wall revealed a large number of shattered rocks of various sizes. Rockfall impact scars were common up to 40 m from the cliff base. A minute later, a zip and crack sounded as a small rock fell right by Ben, for no reason. Helmets were mandatory! They decided to shelter either under a large overhanging boulder, or well clear of the overhanging headwall.

Rockfall was only one of the challenges. The wall turned out to be

about 35 m total, and it had two sections, with a big ledge in the middle. The ledge was a blessing, since it looked wide and flat for staging. Unfortunately, the rock in these sections had two distinct characters: very good up high, and very bad below. The first 20 m segment was impossibly unconsolidated wet crumbly shale, covered in vegetation, with 8 m of sheer vertical sediment held together only by roots.

Sean decided the best approach was to climb up a steep vegetated slope to the (climber's) right of the cave, then traverse horizontally about 30 m on a vegetated ledge to get to the base of the wall below the cave. From there he planned to make the 20 m climb from the ledge on solid rock to the entrance. Sean started up the slope as the first pitch, making very quick progress as it was pretty much just crawling up the slope and grabbing trees and things. He slung a few poorly rooted saplings with Dyneema, more for psychological comfort than anything. A fall here would create a pretty gnarly veggie blender roll. Sean reached a small spring pool at the base of a tree, then Ben followed with a static line.

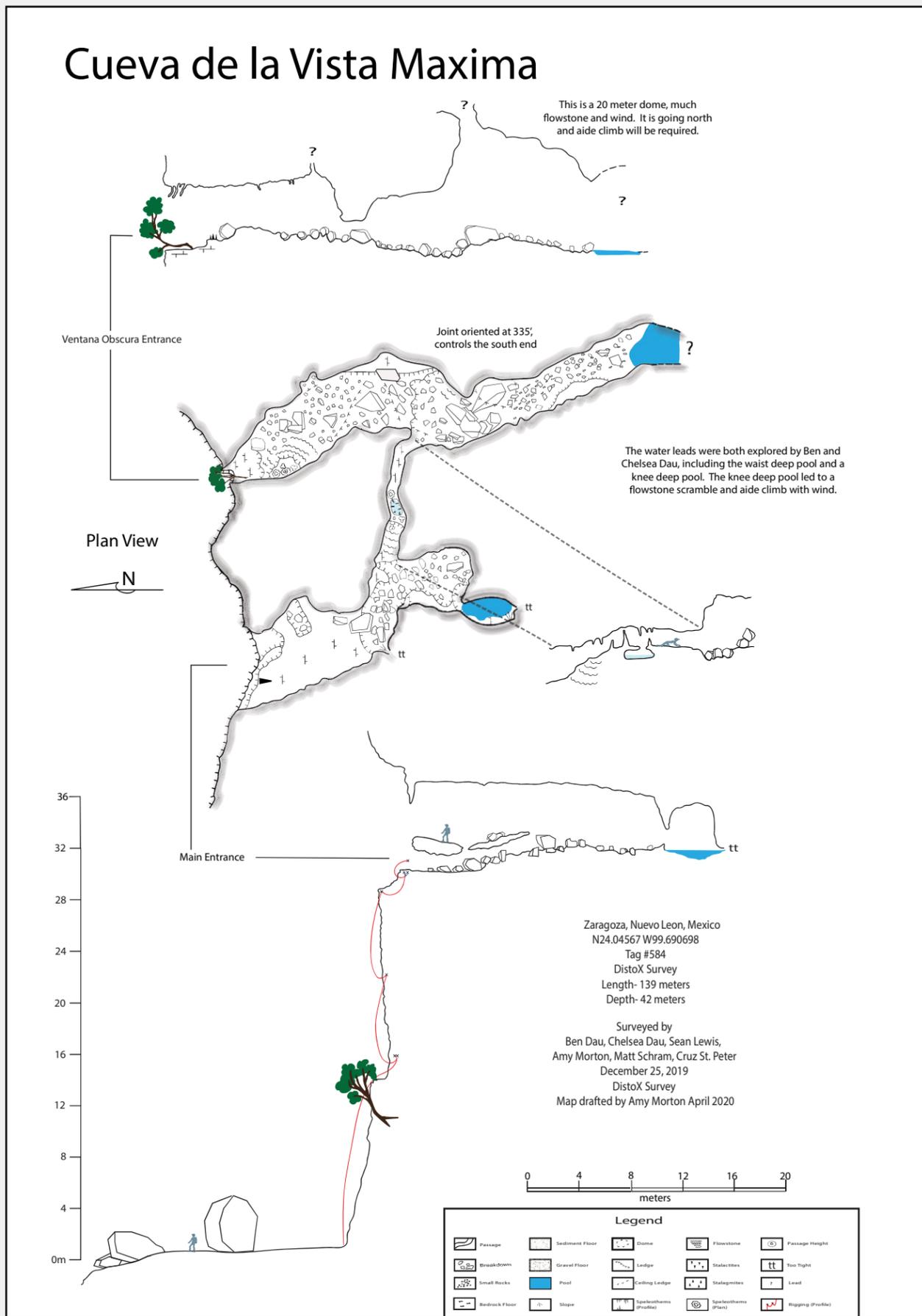
Belayed by Ben, Sean made his way across the traverse. He slung a big tree, passed behind another solid, large tree and onto the 40 cm wide ledge. There he ran into a new problem: long dead and desiccated poison ivy vines, which created a cloud of toxic dust at the slightest touch. Just past a large vine, the ledge ran out.

He traversed back to Ben's belay position and obtained some bolts. He set a bolt, got across a crux move, set one more bolt, and made it to the base of the real climb.

At that point they set a double-bolt anchor and ran a static line over a root and down to the old plunge pool directly below the cave so the rest of the team could ascend. They began staging gear for the third pitch, a direct bolt route up the wall to the cave entrance. With Amy on belay, Sean started up the flat featureless limestone wall. As it began to get dark, he began running into some flakes halfway up. They decided to save the remainder for the next day, so they set some bolts and rappelled back to the arroyo. A flock of parrots gathered around their camp as the night cooled down.

On Christmas morning Ben and Sean were first up to the ledge. Sean climbed up to the bolts, then Ben followed to set up a belay station. They began the 4th and final pitch of the climb, with Sean angling sideways a bit to avoid fall danger on Ben. Sunlight would never reach here, as the overhanging cliff was north-facing. This was fortunate, as the days were hot. This pitch had a lot of rocky flakes that sounded with a dull thud when hit. They tumbled and exploded 40 m below. After setting perhaps eight quickdraws, Sean reached a point 2 m to the side of the entrance lip. An overhanging ledge jutted straight out a meter from the wall above Sean, draped with thick poison ivy roots. He placed a couple more bolts and was able to stick his head above the lip.

Cueva de la Vista Maxima



“This must be a big cave because there’s a river of cold air coming out!” The breeze was cool and continuous, pouring off the lip like a waterfall. This wasn’t recirculating air. Finally Sean plopped his body into the entrance and placed bolts for a static line. He was nearly out of bolts, but had enough to rig an approach line. There was a stunning view looking out of the entrance, and a borehole behind him. A giant going cave with an entrance view like this comes along once in a lifetime. This became known as Cueva Vista Maxima.

Ben, Amy, and Matt climbed, then Chelsea came up and cleaned the quickdraws behind her. They recovered the dynamic rope, although the last 2 meters got stuck in a tree and were lost. Cruz came up last, and they celebrated being the first humans in this beautiful place. Ben and Chelsea went to look for leads while Cruz and Matt read instruments for Sean and Amy, who sketched plan and profile, respectively. They mapped about 140 m of passage that day and found several high leads that would require bolting. There was one possible dive lead near the entrance. The cave trends upward, and there is plenty of mountain above. The largest room in the cave had a 22 m tall flowstone slope. Beyond that there was a nice colony of bats and a small lake. The lake terminated at the far end to a flowstone choke. Ben and Chelsea explored a lead with airflow that continued and would require bolts.

What’s been seen of Vista Maxima so far is a set of two parallel paleo routes, each with big entrances on the cliff face. The two halves of the cave are connected by a small overflow tube about 1.5 m in diameter with some small dripstone formations. Both halves are large passages, averaging 8 m in diameter, with clean-washed rock indicating significant water flow during flood periods.

Access was via the western entrance. The view looking out of the Vista Maxima entrance looks more than 2 km to the north across a wide valley and over to a 2 km high mountain. It is truly spectacular. In the western half, the water originates from a deep stagnant pool which is likely a sump which requires diving.

The eastern half of the cave is more interesting and longer. It goes to a smaller, 2 m wide by 4 m high cliff entrance with a big tree, which got named Ventana Obscura. Most of the cave’s air actually goes out the eastern entrance, rather than the western route. The wind originates entirely from two 20 m high domes on the upstream end of the eastern route. The eastern half goes to a small lake about 0.2 m deep. A 20 m high dome in the tallest part of the passage has flowstone covering one wall. The dome has a large passage above that is at least 4 m tall and wide, which is a good future lead requiring further climbing.

About 10 m above both entrances, a slanting fault descends through the cliff face at an inclination of about 20 degrees down-slope east. It intersects with the vegetation in the cliff face right at the location where the bulk of the water comes out of the hill in multiple springs. Exploration may intersect with this water when the level of the fault is reached, and the cave may be structurally controlled by that fault.

The cave should continue to be highly vertical with climbing obstacles throughout. Much of the cave may be an in-feeding network from the higher plateau, so accessing it from below could take a lot of climbing. The plateau area is about 1.5 x 1.5 km, or about 2 square kilometers with multiple possible infeeding routes. The cave should be at least a few kilometers long.

The hike back to the truck was expected to be a grueling one. One thing working in their favor was lighter packs, as the cave had consumed lots of food, rope, and steel over the past week. Even with less weight, the hike up from the cliff camp was difficult. Steep terrain covered in

leaf litter caused them to slide back with each step. Ben improvised a technique where the lead person would drop their pack and ferry up a section of rope ahead of the team and set a tree anchor. Then the rest of the team would jug up the steep section using their ascenders. The process was slow, but effective, and most importantly, safe! Eventually they all made it back to the truck, but they were too tired (and too thirsty) to join the other half of the expedition that day, so they pitched camp one more time in Garza. Fire, fresh food, beer, and level ground was enjoyed by all. On December 27th they drove southeast to join the others in Pizaña Pass.



Meanwhile the other half of the team had driven three trucks east toward the village of Dulces Nombres on 22 December. Steep parts of the dirt road were paved with corrugated concrete. Eventually, they left the road proper, and after a couple of false starts went through a fence to the stone remains of an abandoned mining outpost. There was plenty of flat ground for tents, a cook table was set up and dinners materialized from coolers. Everyone was pretty glad to put their heads down for the night.

The next day they set out hiking in search of caves. A local spring turned out to emanate from a short resurgence cave. Cueva del Ojo de Agua was mapped by Juan, Marco, and Peter Anderson. It was 15 m long and led to a sump. Ken, Tiffany, and Wesley set off to look at a lead that Peter Sprouse had spotted on Google Earth. Oh Rats Cave turned out to be a large entrance that went in 25 m, with no continuation. Cathy stayed in camp and stamped numbers on PEP entrance tags and fetched water from a nearby spring.

On December 24, taco-powered people set out in search of caves. Just northwest of camp, Ken, Wesley, and Tiffany mapped four caves, Havensman’s Crawl, Soulful Looks Cave, Tiffy Wolfie Cave, and Hairy Pine Hole. Peter S and Juan mapped three caves, Pozo Lavandería, Cueva Costillas Rotas, and Cueva del Rollo Perdido. Peter A and Marco hiked up the mountain to the south and mapped Cueva del Tabano, a short horizontal cave, and Pozo Armadillo, the latter a shallow two-pitch cave at 2630 m elevation. They returned just after dark with news of a large cave, big enough for multiple survey teams. The Milky Way was beautiful that night, and the temperature was on its way down.

Christmas morning dawned with a heavy frost covering everything. But as soon as the sun hit the frost, it was gone. Everyone got their gear together and headed off to the big cave. Following old roads, they climbed up the hill into a roughly “L” shaped sinkhole, where a great yawning maw of a cave had breached the headwall. Large fang-like



Pozo Pizaña.
MARCO RAMOS

hiked up Cerro Pizaña south of camp and mapped two caves. Pozo Pizaña was a 27 m deep plugged pit. Pozo Pizaña Pequeña was a sloping cave that got too tight. The Vista Maxima crew arrived in camp early enough that the folks in Cruz's truck decided that they had time to drive to Zaragoza for beer. They returned to camp happy until they discovered that some of their gear had bounced out of the back of Matt's truck on the return from Garza. So they backtracked and actually found their missing gear along the side of the road.

On December 28th Ben: Ben Chelsea, Cruz, and Marco found a pit while ridgewalking south of Margaras. Pozo de Cuchillo was followed down several pitches (past a cow skeleton) to a depth of 37 m. The two Peters, Juan, Matt, and Cathy drove headed to El Armadillo, a spot on the map north of Dulces Nombres. A possible resurgence cave in a nearby canyon wall had been seen on aerials. Once past Dulces Nombres, the road descended very steep with challenging switchbacks, crossing a canyon at that was left of a mining outpost. A steep logging road climbed up the other side. Right when Peter's Sequoia was straining up a particularly dicey bit, a Dulces Nombres resident and his dog coming down the road came upon them. He gave them driving advice and they continued up the ridge.

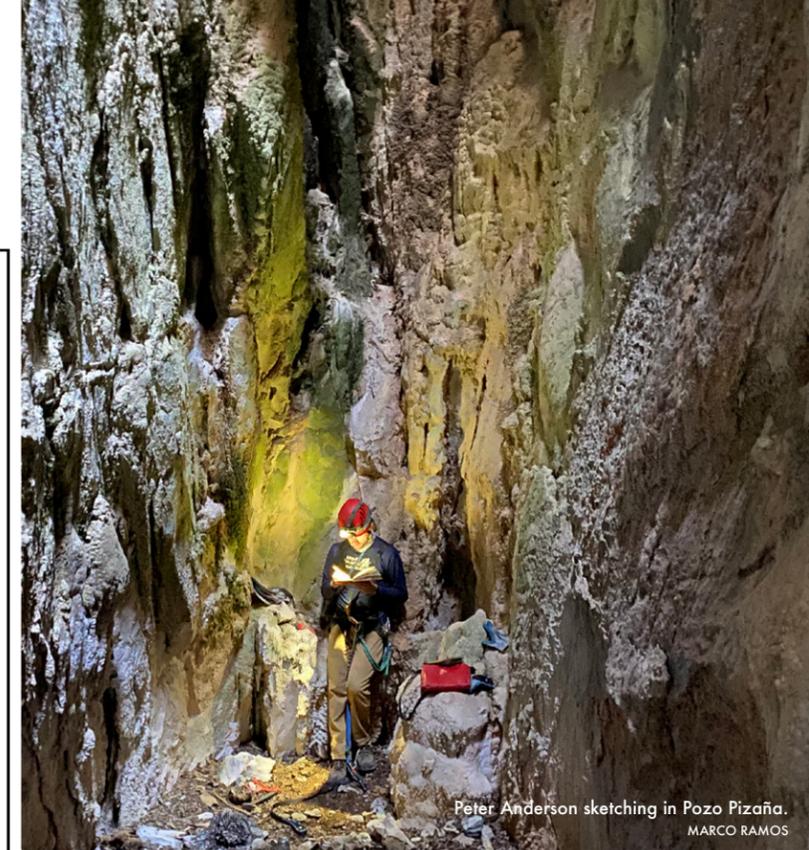
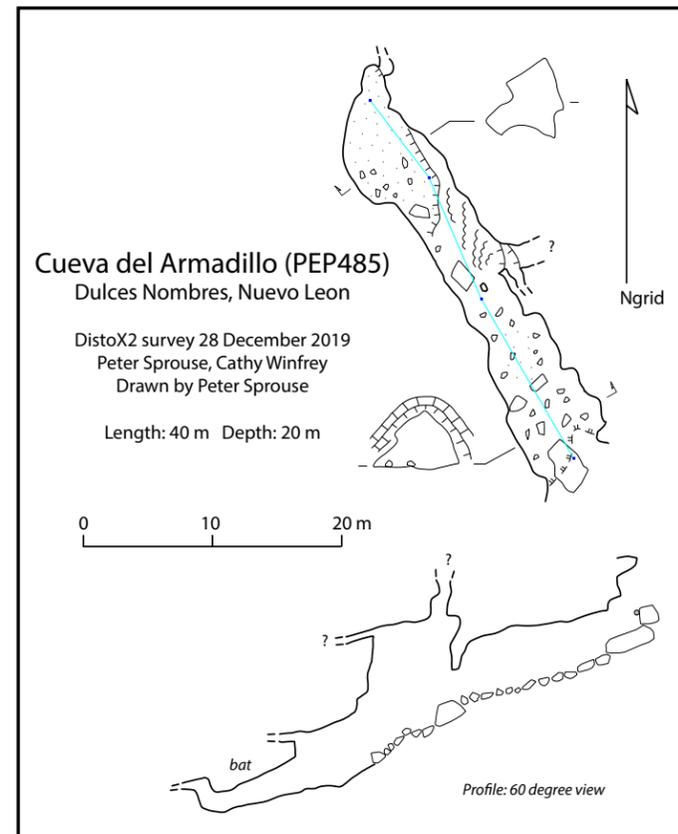
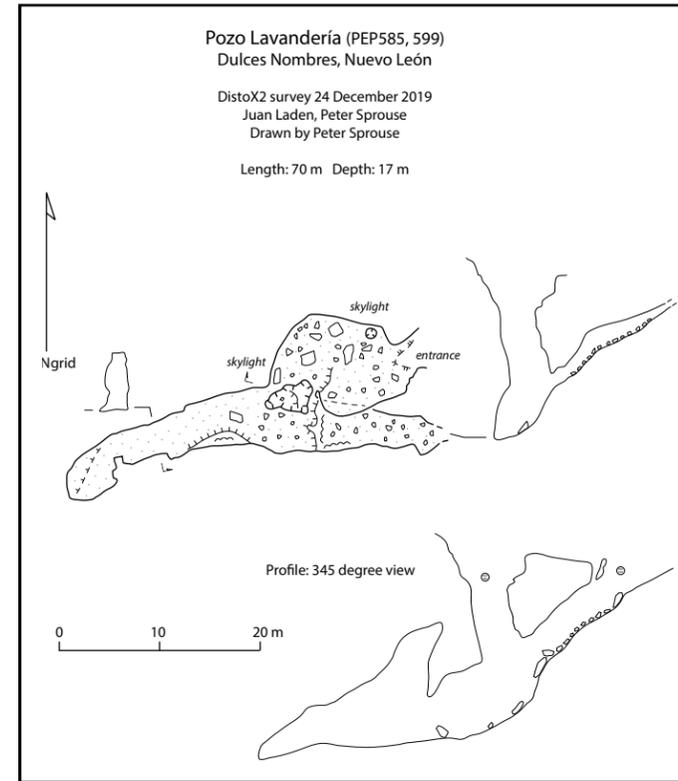
Peter A., riding the bumper, spotted a cave entrance by the side of the road. Peter and Cathy had a look at this. Cueva del Armadillo was developed on a very nice anticline, but ended after 40 m length and 20 m depth. The others took the drone to the edge of the canyon and shot a number of videos, but no resurgence cave was seen.

On the final caving day Peter A. led a team up onto the high karst west of Margaras, where there were old tales of deep pits. They found nothing deep, just a 15 m pit with two small drains, but they didn't explore it. Ben and Peter mapped two pits on the south side of Margaras. Pozo del Caballo Triste was only 7 m deep, but had a blowing dig lead at the bottom. They worked on the dig enough to see that it could be passed with two people working on it for a day. Pozo Nido de Moscas was one of Pablo's leads. It had a great view from the entrance and was 23 m deep. The final evening in camp featured an Asian-style dinner of sorts, and music around the campfire. The cold wind picked up and tried to take the tents down early for us. The pans and kettles left on the cook tables after dinner were scattered downslope by midnight, and tents flapped vigorously all night. Everyone was bleary-eyed the next morning.

On December 30th, nearly out of food and beer, it was time to drive down the mountain. Sean was particularly keen to reach a pharmacy to get treatment for severe poison ivy he'd gotten on the Vista Maxima cliff climb. He was directed to a physician. The doctor determined that a steroid shot was needed, and but upon returning to the pharmacy they found the doors just locked. Luckily the counter ladies recognized the doctor and re-opened for him. Meanwhile a pre-New Year's party was underway in the Aramberri plaza, with loudspeakers set to maximum nearly all night. The next day included a stop at Pozo del Gavilan on the way to Isabel Grajales' house for New Year's Eve. Crossing into Texas on New Years morn was easy. With the radio on driving north to San Antonio, there was a news report about an outbreak of a mysterious new disease in China.



Tiffany Nardico at Cueva Cementerio de los Tecolotes.
PETER SPROUSE



Peter Anderson sketching in Pozo Pizaña.
MARCO RAMOS



Cathy and Ken in Cueva Cementerio de los Tecolotes.
MARCO RAMOS

LAS CHINAS

June 2021

By Bev Shade

PARTICIPANTS

Page Ashwell
 John Benac
 Ken Demarest
 Edgar Garcia
 Osama Gobara
 Isabel Grajales
 Barbara Luke
 Abigail Mack
 Cait McCann
 Carlos Ortega
 Leonardo Segura Teviño
 Bev Shade
 Vickie Siegel
 Geraldine Solignac
 Peter Sprouse
 Cruz St. Peter
 Mowgli Swartz
 Noel Vazquez
 Cathy Winfrey
 Lilianna Wolf

BACKGROUND

Although there have been a flurry of PEP trips in recent years, they were all on the west side of the project area. It's been a long time since cavers travelled to the east side of the Purificación area. This was due to the reports of cartel violence and instability around Ciudad Victoria. In the past 5 years or so, we'd been hearing that the situation was improving. Finally, in the spring of 2021, Peter Sprouse told me he felt comfortable doing a recon to the east side. Excitement was high to return! Instead of trying to figure out the field house situation in Conrado Castillo, we opted to revisit Las Chinas, which is far south down the ridge, but has been a great place to find caves in the past. As always, the trip was too short, and we left with going leads and the desire to return soon.

View out of Pozo Pared Llorona.
PETER SPROUSE

Getting there – things have changed

ON JUNE 18, the people coming from Texas got up before sunrise and drove to McAllen. We had a smooth crossing at the Andulzas Bridge, and got to Isabel's house on the south-east side of Monterrey in time for dinner. June 19 was a flurry of packing and last minute grocery stops, but we eventually got to Santa Engracia. Everything looked familiar until we turned west at the last crossroads to start the drive up the mountain. Suddenly the well-worn road ended in a wall of vegetation. We pushed the trucks through the increasingly thick scrub and trees for a few hundred meters but after that we could not continue without cutting a patch wide enough for vehicles.

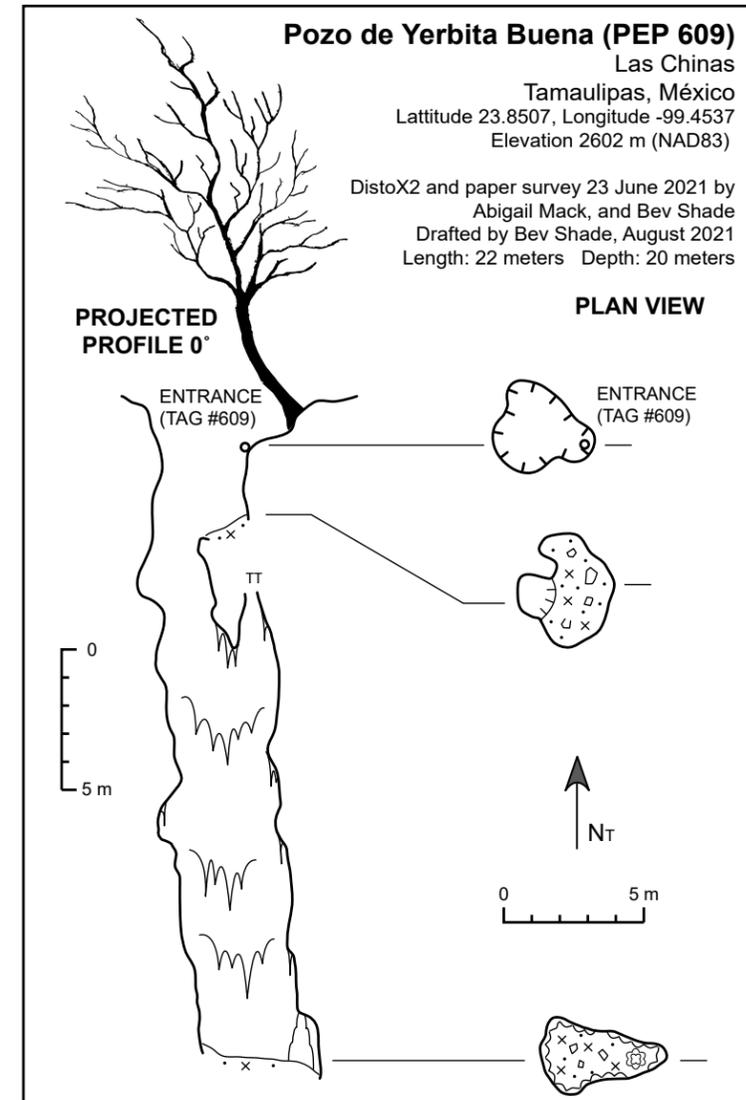
Clearly, there was a new road. We just needed to find it. We met a local rancher who said the road had been closed because of criminals using it. He was not sure where the new road was. We kept asking and eventually found the way on in the small community of Aurora, located just west of Santa Engracia. So – pass the old Hacienda in Sta. Engracia instead of turning right. The road at Aurora has been in service since at least 2007, as Gill Ediger and I had driven down it but I've never been clear on where it started. I guess that the section of road that's closed now just fell out of use and gradually grew over. As a side note, there's a shiny new Pemex at the turn off to Sta. Engracia, no need to stop for gas in Barretal.

Between the shuffle of getting started that day and searching for the Aurora road, we had lost several hours. We paid for that time later on. The road from Aurora to Revilla was fine, not many changes. Past Revilla it's definitely rougher, seems less used. We left the main road near Rancho Nuevo and followed a rough track to the Las Chinas area. This track was very rough – lots of big sharp rocks to navigate, a few trees to move, and some big deep mud puddles. Even with the long summer days, it got dark long before we stopped driving. The water in the last puddle was deep enough to flood the breather tube on my rear differential, so the lockers stopped working. This was a bit of a bummer, since I didn't know what had happened until we got home. Luckily it turned out to be an easy fix. Finding a good campsite in the middle of the night was a challenge but we eventually managed it.

Caving

JUNE 20, we were all a bit tired from the late night but ready to look for caves! We had a quick orientation, spent some time making sure everyone had basemaps and apps for navigating, and split into groups.

- Mowgli, Cait, Lili and Edgar started with a small cave named Pozo Entre Dos Magueyes, then re-located a deep pit near camp that continued (Pozo de Ventana al Cielo).
- Bev, John, and Carlos mapped three small pits (Pozo de Schoenocaulon Morado, Pozo de Heather, Pozo de Lagartija Colgada) and relocated PEP199. This was fortunate since it's one of the few tagged caves in PEP that hasn't been mapped, and the old location was off by several hundred meters.



Muster at Isabel's house.
PETER SPROUSE

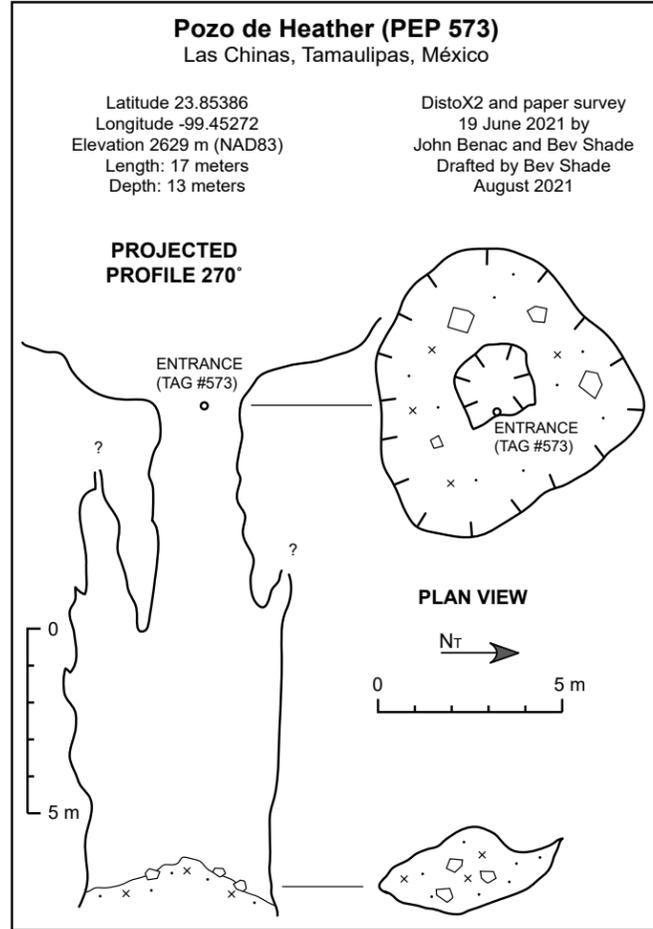


- Cruz, Abigail, and Ken mapped three caves west of camp (Pozo Vista de Vicente, Pozo Siguiendo las Reglas de Bev, and Pozo PEP602).
- Vickie and Barbara mapped three pits southwest of camp (Pozo Columbine, Pozo Oops, and Small Pit Big Kitty).
- Peter, Page, and Leo found a bunch of leads and mapped one of them (Pozo Segundo Cita).
- Géraldine, Osama, Noel and Isa mapped a small pit (Cueva de Muchas Hojas), and found a bunch of pits close to camp. They started rigging Pozo del Frio 1.

JUNE 21 was another productive day, despite a big storm that had folks on the surface running for cover in the afternoon.

- Mowgli, Cait, and Edgar returned to Pozo de Ventana al Cielo, pushed it to a mud plug at about 100 m depth, and finished mapping.
- Bev, Géraldine, and Osama went to Pozo del Frio 1, which had been started the previous day, and pushed from -40 to about -100 m, running out of rope and unable to see a floor!

- Ken, Cruz, Isa, Leo, and Abigail attempted to meet Vicente (local cowboy who had some pit leads), but didn't find him. Instead, they mapped Pozo del Frio 3, pushing it 60 m deep to a mud plug. They also finished Pozo del Frio 2, a small pit nearby.
- Barbara, Vickie, and Noel mapped a 30 m deep pit (Pozo del Sol y



Sombra), then got caught in a hail storm. They went back to camp and helped Cathy repair basecamp.

- Peter, Page, and Carlos went to the rim of the big canyon to the south. They flew a drone and found interesting cliff leads about 70 down. Page was rappelling down to check these leads when he was turned back by the hail storm.

JUNE 22 was a busy day, with people scattering in all directions.

- Barbara, Vickie, Mowgli, Noel, Lili, and John all went to Pozo Nido Fragil, pushed and mapped to 60 m depth.
- Bev, Cruz, Osama, and Géraldine returned to Pozo Frio #1. Turns out when I wasn't able to see the floor the previous day; my battery was almost dead and the mud plug that ends the cave was just 10 m below where I ran out of rope the previous day. Cruz and I collected invertebrates and surveyed up while derigging until we met Osama and Géraldine mapping on the way down. The cave finished at 123 m deep. Afterwards, we did a short hike and found 3 small pits and 1 bigger pit.

- Abigail, Ken, Page, and Carlos rappelled down the cliff to the previous day's drone leads. A great hiking adventure in the canyon, but none of the leads went.
- Peter, Isa, and Leo went on a long hike. They mapped two caves (Pozo de Perro Leo, Pozo Vaca de Martes) and located five more.
- Edgar and Cait found several caves. They started rigging one esti-



Bev leads team briefing on the first day.
PETER SPROUSE



Carlos, happy to be here.
PETER SPROUSE

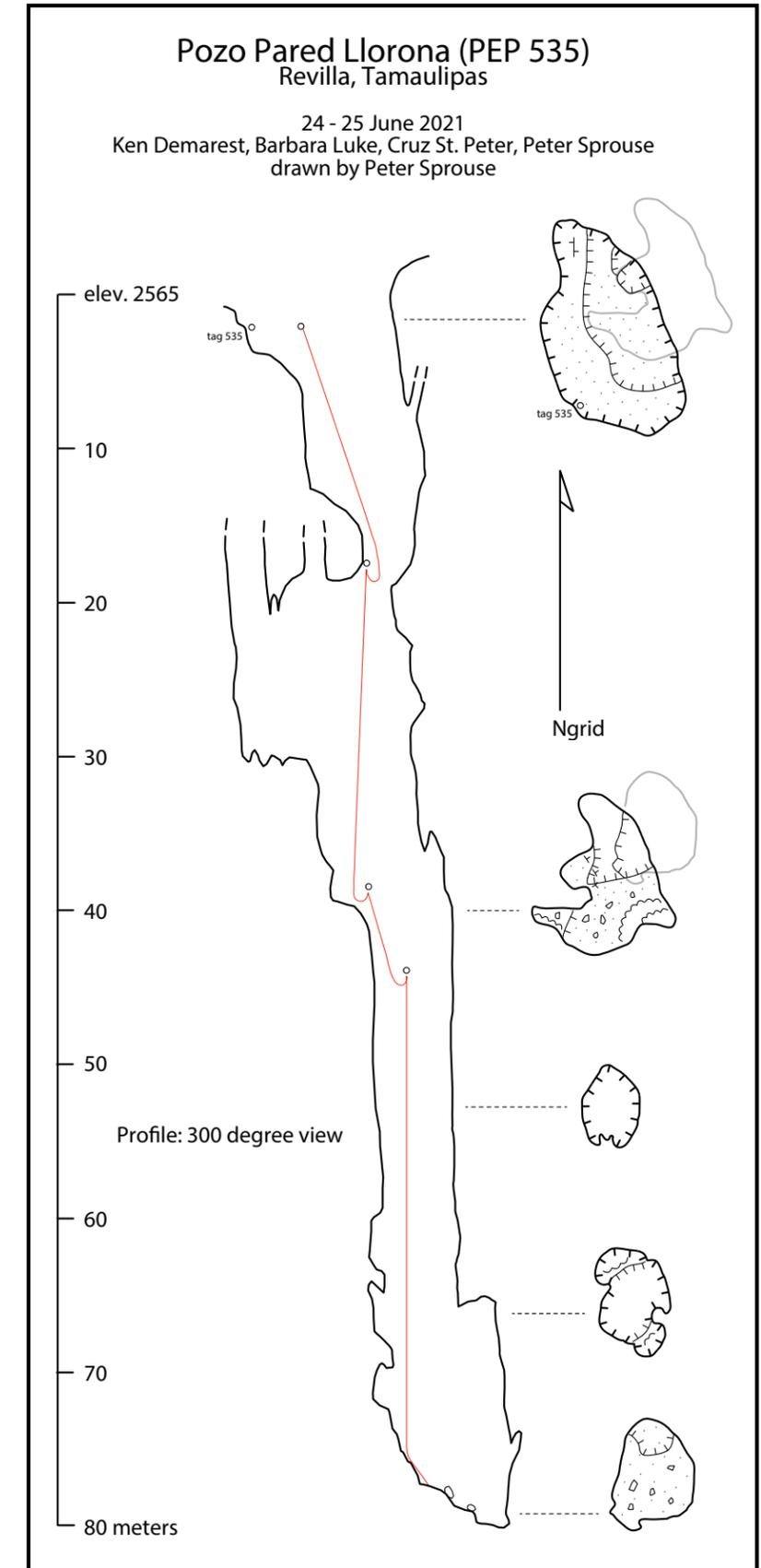
mated at 80 m deep, but decided they wanted more rigging support.

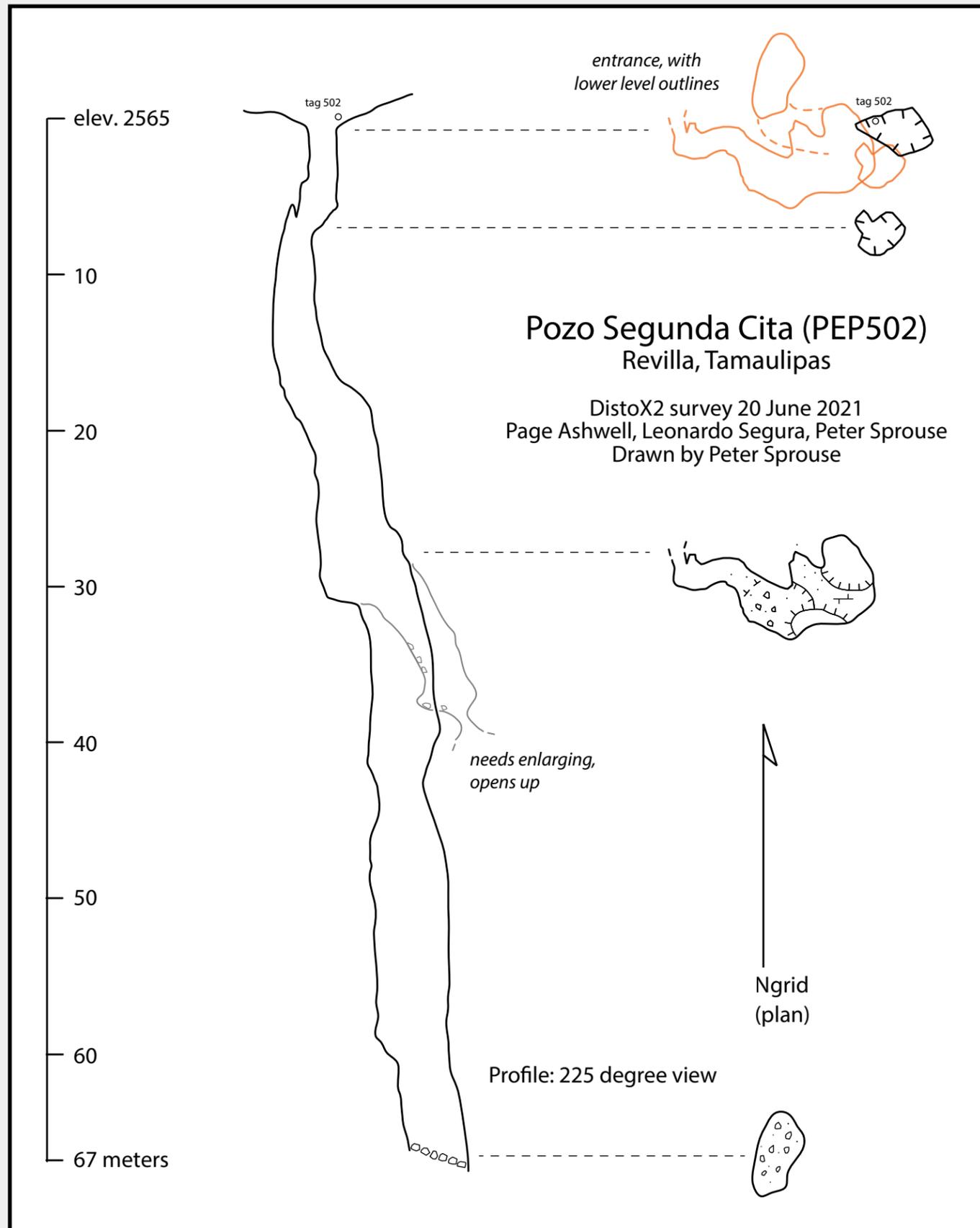
JUNE 23 was a warm day and saw the team pushing lots of pits. There were also some big hikes.

- Page, Lili, and John hiked to the Fire Tower and found several good leads, all pits and 1 small cave with a crawl entrance.
- Cruz, Cait, and Edgar returned to their pit from the previous day (Pozo de Cinderella) but it pinched out at less than 30 m; they mapped another small cave nearby (Pocito de Hierbabuena).
- Peter and Isabel drove back north toward the Rancho Viejo turnoff and then hiked west. They found three pit leads that looked to be over 100 m deep, and it seems like there are more pits to be found here.
- Abigail Mack, Osama Gobarra, Leonardo Segura, Mowgli Swartz, and I went on a long meandering hike that started with a nice pit we had found the previous day north of camp (Pozo Modo Ciego). We covered a lot of ground but didn't find much else. On the way back to camp we mapped a small pit (Pozo de Yerbita Buena).
- Barbara and Noel mapped two pits (Pozo Caracol Dormiente, and Pozo Arbol Caído).

JUNE 24 was another busy day finding and mapping caves.

- My team this day was Carlos, Mowgli, Edgar, and Abigail. Peter showed us a pit he had found on a ridge west of Rancho Viejo (Pozo de Historia Sin Fin). There was a large plugged sink that looked grim, but there was a small blowing hole upslope that had escaped getting filled with surface debris. We had to dig it open, and luckily found a stable bedrock edge. While Carlos and Mowgli were rigging, Abigail, Edgar, and I mapped a small pit nearby (Pozo de Reloj Arena). By now, rigging in Historia Sin Fin was well underway and we started surveying. The entrances pit dropped 65 m to a comfy ledge, then past a flowstone bridge it dropped





another 35 m to a narrow sloping rubble floor and another pit – small at the top but opening up. We ran out of bolts, left what rope we had left there.

- Cait, Page, and Noel mapped a deep pit nearby (Pozo Perfecto de Paco). They were short roped at a depth of 80 m. Page estimated another 20 m to get to the floor.
- Peter, Ken, and Isabel went to another deep pit nearby (Pozo Pared Llorona), where they were short roped at 50 m.
- Barbara, Osama, Géraldine, and John mapped Pozo de Tres Nidos. Vickie, Lilianna, Cruz, and Leo mapped 2 small pits (Pozo Murmillo, Pozo Plotting and Plopping).

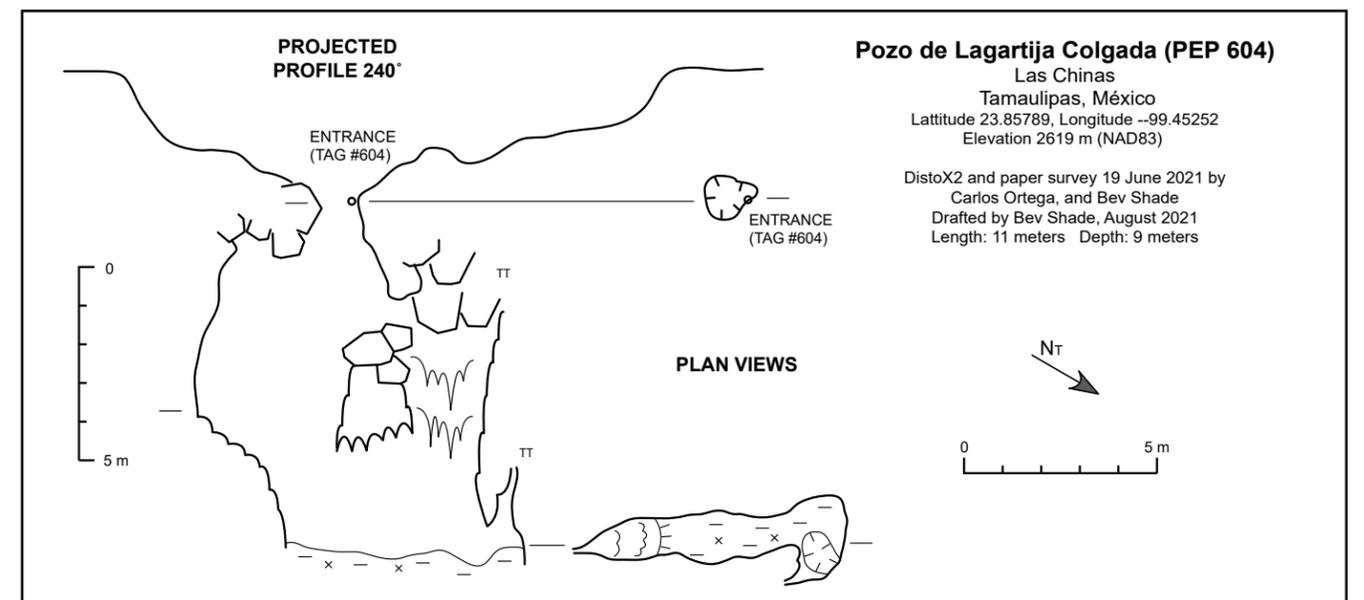
JUNE 25 was our final day of exploration.

- Carlos, Mowgli, Abigail, Edgar, and I returned to Historia Sin Fin to continue pushing. As we got gear ready at the cave entrance, our radio crackled to life and Cathy let us know there was a medical problem back at camp. I returned to camp to assess, while the rest of the team continued. They pushed down 40 m to a window through a large bedrock flake where they ran out of rope. The cave continues down this pit. Back at camp, I found that Leo returned from hiking, feeling short of breath with some symptoms of mild allergic reaction. After a few hours he was fine, but it was too late to rejoin my team, so I stayed and helped pack up camp.
- Cait, Page, and Noel returned to Pozo Perfecto de Paco and it kept going at a depth of 154 m.
- Barbara, Ken, and Cruz finished mapping Pozo Pared Llorona.
- Géraldine, Osama, and John mapped Sotano del Rancho Nuevo, explored by David McKenzie decades earlier but not surveyed.

June 26 we got up early and started driving as soon as possible since we had a long way to go. On the way down we ran into Chench Ledesma driving his logging truck up to Conrado Castillo. He said it would be fine to use the field house at Christmas.

CAVES MAPPED

TAG	CAVE NAME	LENGTH(m)	DEPTH(m)
486	Small Pit Big Kitty	11	6
487	Pozo Plotting and Plopping	20	18
500	Pozo Columbine	16	18
501	Pozo Murmillo	29	28
502	Pozo Segunda Cita	86	65
532	Pozo del Perro Leo	12	9
535	Pozo Pared Llorona	89	77
538	Pozo Oops	5	5
565	Pozo de Schoenocaulon Morado	7	6
569	Cueva de Muchas Hojas	4	4
570	Pozo Siguiendo las Reglas de Bev	7	5
573	Pozo de Heather	17	13
575	Pozo Vista de Vicente	47	46
577	Pozo del Sol y Sombra	33	31
589	Pozo Ventana al Cielo	122	100
592	Pozo del Frio 1	132	127
596	Pozo de la Vaca de Martes	26	16
597	Pozo Entre Dos Magueys	12	6
598	Pozo Cinderella	34	30
602	Pozo PEP602	7	7
603	Pocito de Hierbaguena	8	7
604	Pozo de Legartija Colgada	11	9
605	Pozo Modo Ciego	65	50
606	Pozo del Frio 2	8	7
607	Pozo del Frio 3	60	51
608	Sotano del Rancho Nuevo	48	42
609	Pozo Yerbita Buena	22	20
612	Pozo Perfecto de Paco	169	154
613	Pozo de Reloj Arena	13	11
615	Pozo del Nido Fragil	62	59
616	Pozo Caracol Durmiente	29	28
617	Cueva Arbol Caído	9	6
618	Pozo Tres Nidos	24	21
619	Pozo Historia Sin Fin	156	123



SISTEMA PURIFICACIÓN

December 2021

By Alex Seaton

PARTICIPANTS

- | | |
|---------------|--------------------|
| Abigail Mack | Ethan Perrine |
| Alex Seaton | Géraldine Solignac |
| Amy Morton | Isa Grajales |
| Barbara Luke | Katie Graham |
| Ben Dau | Mowgli Swartz |
| Bev Shade | Nancy Pistole |
| Bill Stone | Noel Vazquez |
| Cait McCann | Matt Oliphant |
| Cathy Winfrey | Osama Gobara |
| Chelsea Dau | Peter Sprouse |
| Colin Magee | Sean Lewis |
| Cruz St.Peter | Vickie Siegel |
| Dan Green | Victoria Smith |
| Edgar Garcia | |



Osama Gobara descends below Travertine Trail toward The Angel's Staircase. ALEX SEATON



Dan Green and Barbara Luke setting the Infiernillo rope. ABIGAIL MACK



Géraldine Solignac and Abigail Mack heading for Brinco. ALEX SEATON

I JOINED THE December 2021 PEP expedition, led by Peter Sprouse, which was the first expedition to Sistema Purificación for many years, and ran from the 11th of December 2021 to the 1st of January 2022. The expedition involved a diverse group of 27 cavers travelling from Canada, Mexico, and the US, and was broken down into four sub-expeditions: exploration of Cueva Vista Maxima, a gaping cave entrance that had been known about for decades, but which had only recently been entered due to its remote location and the difficulty of access (led by Amy Morton and Sean Lewis); exploration in the Confusion Tubes based out of Camp I in Infiernillo, the lower entrance to Sistema Purificación (led by Peter Sprouse); exploration in the Angel's Staircase based out of Camp VII in the World Beyond, accessed via the Brinco entrance on the top of the mountain (led by Dan Green); and exploration of Sótano de la Cuchilla and other shallow caves on top of the mountain, based from the PEP field house at Conrado Castillo (led by Bev Shade).

On the 11th of December we drove from Austin to Monterrey. I rode with Abigail in her truck "Mr. Sparkles" along with Colin and Katie. In McAllen we met the other group travelling down that day via "El Burro" (Peter Sprouse's Toyota). After lunch we headed to the border and were soon speeding down the Mexican highways to Monterrey. We made a stop near a large cave entrance along the way, Cueva de la Boca. In Monterrey we spent the night at Isabel's house, lounging in the garden drinking beer while Dan showed us the survey of the Angel's Staircase. The next morning we departed from Monterrey and

headed for the mountains near Ciudad Victoria. Progress along the mountain roads was slow but steady. As is apparently traditional on PEP expeditions, we tossed tortillas down the mountain on reaching one of the more impressive overlooks. Then we reached the junction to the track to Infiernillo camp. As had been anticipated, the road to Infiernillo camp was in a bad state, and needed repair work to allow the trucks to pass. We spent the next few hours clearing rocks and chopping down trees. The first major obstacle was a small boulder which was successfully smashed to pieces by Dan and Ethan. After passing this we continued for a while until reaching a section of road that had been badly washed out, with a large fallen tree precariously balanced across it. Since these obstacles would take the best part of a day to negotiate, and it was getting dark, we stopped and set up our tents for the night before making dinner.

The next morning Peter went for an early morning road reconnaissance and returned with the bad news that the remaining section of road needed more work than we could reasonably accomplish with the time we had. Fortunately, the additional hike wasn't excessively long, and we spent the day hiking to Infiernillo and rigging the ropes up to it. The approach in the arroyo consists of an intimidating stretch of large boulders that have been deposited by the violent torrent of water that emerges from the cave in the rainy season. After negotiating our way over the boulders, we arrived below the entrance: an impressively large hole in the side of the mountain, which is conveniently located around 30 m above the arroyo. To rig a rope for the rest of us, Dan and

Barbara climbed up, using bolts that had been placed decades ago. This went without major incident, though Dan later developed some nasty rashes due to the poison ivy he had been battling through. While all this was taking place, Colin and Katie had been hiking up the steep slopes around the entrance to search for a cave we thought we had seen from the road. Despite air support provided by Osama's drone, they were unable to find it. They did find another cave, though unfortunately this was only 2 m long and contained several empty beer cans. Since it was getting dark, and the major objectives for the day had been completed, we hiked back to the trucks. The hike back in the dark was reasonably quick, and we were soon back at our makeshift camp making dinner -- tikka masala curry with potatoes, parsnips, and carrots.

On the 14th of December we had two objectives: to check out the state of Camp I while delivering some gear there, and secondly to explore some leads close to the entrance. After bacon and scrambled egg tortillas for breakfast, we hiked over to the newly rigged Infiernillo entrance. The climb up into the entrance was straightforward, and we made the short journey to Camp I. This consists of a large sandy room, with plenty of flat space for people to sleep. Camp I is also conveniently located near the main sump, which acts as a water source. Unfortunately, there was some bad news in that the area normally used for the latrine was flooded; a rather concerning predicament. Having delivered gear to Camp I, we split into three teams to explore leads in the East Loop. I joined Peter and Abigail, while Barbara took Osama and Ethan, and Géraldine became an honorary Canadian since she was teamed up with Colin,

Katie, and Dan. We met the Canadian team on the way to our lead, and found Colin already placing bolts part way up an aid climb. The lead we would be examining with Peter was a small slot in the floor of the Dune Room. After assessing this, we decided the slot could be safely free-climbed down to a smaller chamber with a stooping-height tube leading off horizontally. The climb negotiated, we headed off down the tube to discover that it abruptly became vertical after about 10-15 m. We identified the tie-in station left by the previous surveyors and rigged a rope to descend. I had been assigned the role of 'point person', so led the way to identify the next survey station. I therefore was first to have the discouraging experience of watching the walls of the tube change from clean-washed, dry rock to being progressively coated in more and more mud. That indicates that this passage is sumped in the wet season. Reaching the bottom my feet sank into a soft bed of mud and, not for the first time, I wondered why this was my hobby. Having identified a few stations on the way down, I waited for the rest of the team to finish their tasks and catch up, while eyeing the way on with trepidation. The way on was a smaller horizontal tube, resulting in a more-or-less a flat out crawl through the aforementioned mud, which turned out to be particularly moist and sticky. Peter remarked that this is what he got for bringing a British caver along. Nevertheless, the tube was not without its charms, and I took a couple of photos of the delicate formations lining the sides. We made some progress, but it was soon time to return and meet the other two teams. Retracing our steps, we were soon back with them and looking with jealousy at their clean caving gear. Despite our lead continuing past where we had surveyed, and no doubt leading

to vast lengths of passage, Peter decided it would not be a focus for exploration during the remainder of the expedition. On the way back to camp, Katie and Colin took off at characteristic speed such that by the time the rest of the Mr. Sparkles team had arrived, a bean and green chile stew was ready and was gratefully received.

Having completed the preparations for Camp I sub-expedition, it was time to head up to the PEP field house at Conrado Castillo, the Brinco entrance to Sistema Purificación. After a short break by a stream for lunch, we reached the field house in the afternoon. The field house is a small wooden building leased by the expedition, and is used occasionally by loggers when not occupied by cavers. There was some concern that it might not still be standing, but it seemed to be in pretty good condition when we arrived. Nevertheless, being unoccupied for so long meant that there was a large amount of cleaning that needed to be done. Every surface had a generous coating of dust, rat droppings, while all the nooks and crannies were filled with cobwebs and ominous looking spiders that had to be gently coaxed out and released outside. After a final round of bleaching it was time to make dinner and head outside to sit around the fire.

Our plan for the next day was to travel into the cave via the Brinco entrance and take some supplies to Flowstone Falls, which is roughly half way to Camp VII. However, there were still some fieldhouse tasks to complete, and gear needed to be sorted and packed for the journey into the cave, so it wasn't until around midday that we set off. The Brinco entrance is a relatively unassuming climb down through a gap in a pile of boulders, which leads to a large chamber. This section of cave has the feeling of large 'fossil' passage, and appears to be extremely old. The route on is relatively horizontal in generally large passage (~5-10m diameter), with a series of tedious climbs to negotiate and generous servings of rat and bat droppings sprinkled throughout. It is also completely dry, making it rather warm and pleasant cave. In the past the route was negotiated without any aid, however caving standards have changed for the better so Katie and Colin installed several ropes along the way. Dan also put down flagging tape to mark the route, which combined with the rigging made things considerably safer. We soon reached the Changing Room, where the horizontal passage we had been following abruptly ends (this is an ongoing dig through mud).

The route onwards is a small side passage that leads towards The Crack of Doom. The Changing Room marks the point where the cave



Ethan Perrine clearing the overgrown and boulder-strewn Infiernillo road that cavers hadn't used since 2006.
ALEX SEATON

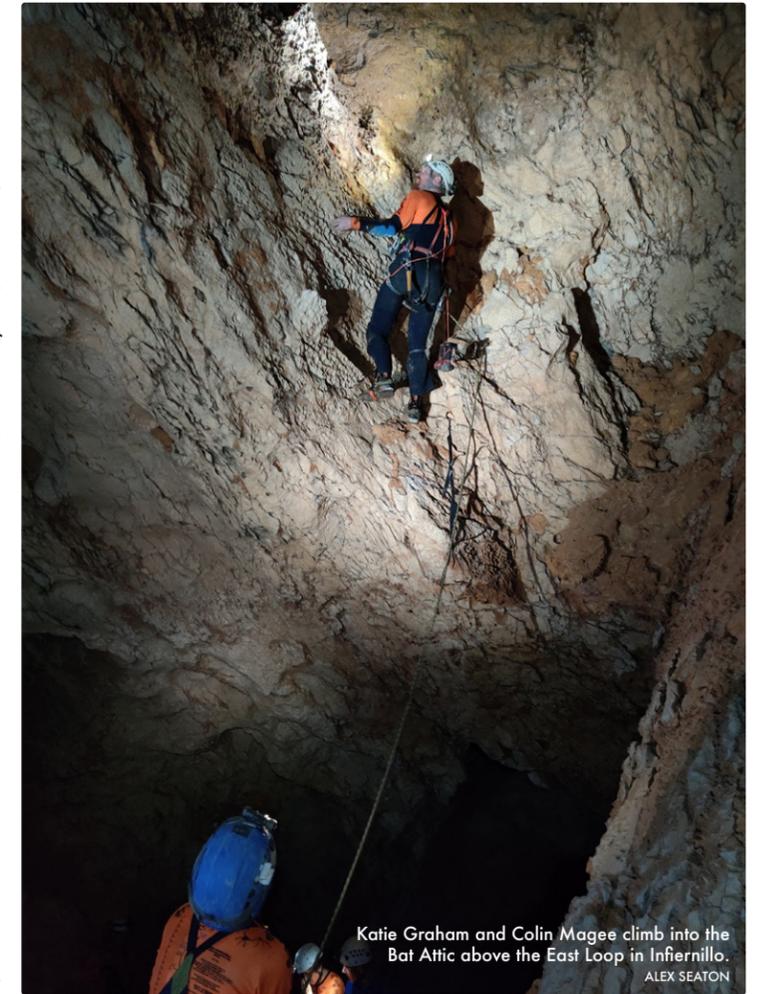
becomes significantly more aqueous, and being nice and flat is a good location for changing into wetsuits. The way on is a climb upwards via a flowstone cascade, leading to a tight, steep chute up more flowstone, and a deep pool. Following the pool is the Crack of Doom itself, a tight constriction roughly 30 cm wide that continues for 5-10 m. Since we had lots of heavy bags, these obstacles are most efficiently dealt with as a team. By stationing people at intervals, we were able to pass bags along and make the experience somewhat less grim than it could have been. Nevertheless, this involved a guaranteed soaking and the utterance of words that I shall not repeat here to avoid offending the reader. Following the Crack of Doom, the passage opens up somewhat and begins trending down, following an active stream. This is also evidently quite old passage, with sections of ancient flowstone that have been long-since eaten away by water flow and now take the form of a thin latticework that sits 1-2m above the current base of the passage, known as the Lunar Way. This material is also quite brittle, as I discovered when part of it gave way under me, and I almost fell down into the stream below. Luckily my fall was broken by another section of this lattice, but I managed to give myself a nasty bruise on my thigh and a corresponding tear in my new wetsuit. Continuing along

the stream of the Río Verde, the passage becomes sporting with several fun climbs down flowstone cascades, and swims across pools formed by rimstone dams. There are few obstacles in caves that are improved by carrying bags, but it turns out that swims are one of them since they tend to be buoyant and make swimming easier. After following the cascades we reached Flowstone Falls, which was the endpoint of our route for the day. Here we deposited the contents of our bags, ate some cereal bars, and headed back for the surface. Since the route out was now clearly marked, we split up and made our way up at our own pace. I ended up travelling out with Ethan, and left the cave just after 6 pm. Colin and Katie had again made it back much earlier, and so a bean stew with fried chorizo and rice was ready by the time I had changed out of my caving gear.

With a good chunk of the Camp VII gear delivered to Flowstone Falls, we had some time available the next day to work on other projects. Peter and Barbara led teams into Valhalla via the French Entrance to follow up on leads there. One prominent objective was to find sections of cave leading upwards, since these could potentially increase the total depth of the cave. As on the previous day, the morning was spent working on various tasks in and around the field house, so we set off for the cave

after lunch. The entrance to Valhalla is a tight squeeze through some unstable boulders, and opens into passage reminiscent of that in Brinco, albeit of smaller proportions. We spent some time finding the route through the cave, which involved several tight sections. On reaching a prominent junction, the group split into the two survey teams. I joined Barbara and Abigail, while Peter's group included Ethan and Osama. At this point Peter realised that we only had one set of survey instruments, so he opted to spend the time identifying and re-flagging old survey stations, and evaluating the priority of the various leads. Barbara led me and Abigail to our assigned lead a downwards-trending passage, which immediately met a horizontal passage going off to the left and right. I again assumed the role of point person, and decided that the left-hand passage looked more promising so we began our survey along it. After a few meters, the passage turned to the right, and began trending downwards again. Following this down, we passed a large vertebra embedded in the mud, which I took some photos of. The passage then turned again to the right, into a small chamber with passage leading in from the top and off downwards. Examining the upward trending passage I realised that this just led back to the right hand section of the horizontal passage we had started at. We quickly completed this loop in the survey, and then headed back down to follow the continuation. While the passage we had been in was quite tight, the next section descended into a crawl. Interestingly, there were signs of people having travelled this way previously. After a few more meters, the passage turned right into a tight slot; a committing flat-out crawl over smooth mud which had clearly been dug out and left unsurveyed. To make things worse, after negotiating the squeeze, I discovered that the continuing passage became too tight to be passed without modification. With no room to turn around I then had to travel back, feet-first, through the constriction. This was a rather awkward maneuver and took me the best part of 10 minutes to accomplish. Somewhat disheartened, and in any case having run out of time, we headed back to meet Peter's group. We then retraced our steps back to the entrance, and the fieldhouse. Colin had stayed behind to do some work on the field house, and on our return we discovered it sported a newly constructed balcony. There was also a newly constructed curry waiting for us, which we were very grateful for. I then spent the rest of the evening working on repairing the tear in my wetsuit.

On the 18th of December I woke early with an urgent need to visit the outhouse. This turned out to be a running theme for the rest of the expedition and the cause of considerable anxiety. We prepared for another trip into Brinco, and after another trip to the loo we were ready to set off. A crack team of Dan, Colin, and Katie were to travel all of the way to Camp VII and deliver some of the gear. Simultaneously, I would travel with Osama and Barbara down to Flowstone Falls to bring the last of the group gear there. I was also keen to take some photos in the cave, particularly in the stream passage. We made good progress down to Flowstone Falls and were glad we didn't have to carry as much as the previous trip. Sadly, on unpacking the packs Osama discovered that one of the Daren drums he was carrying had broken, so the gear inside was completely soaked. Since we were making good time, we took a more leisurely pace on the way out to take photos. Although paranoid of dropping my phone and soaking it, I successfully avoided



Katie Graham and Colin Magee climb into the Bat Attic above the East Loop in Infiernillo.
ALEX SEATON

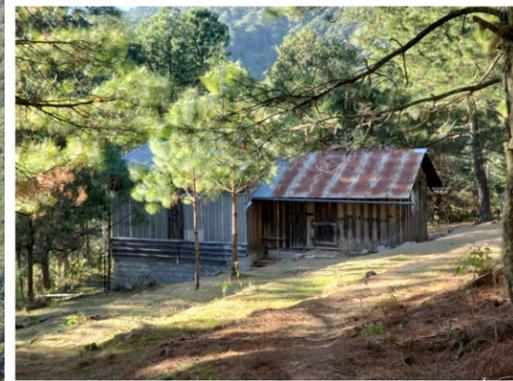
this. However, Barbara began to get cold because of the slower pace, so we gave the pictures a rest and focused on progressing out of the cave. We reached the surface relatively early, and were back at the field house by around 4 pm. After dark we sat around the campfire and watched Dan bake bannock over the fire.

We awoke to the sound of light rain, and emerged from our tents to find the forest murky and draped in clag. A huddle gradually formed around the coffee pot, which put enough life into us to start the process of preparing breakfast. Finally, a fiery shakshuka with toasted English muffins (I'm pretty sure English muffins are American) allowed our spirits to recover. The elements overcome, we set about deciding on the plan for the day. After some deliberation, Katie decided to lead a trip into Brinco to do some photography in a side passage called the Helictite Passage that was rumoured to be well-decorated. I was keen to join her for this, as was Ethan. Since our caving gear had been soaking in the rain overnight, changing was an unpleasant experience, but we persevered and were soon back in the cave. The side passage that was our target is located a short distance from the entrance and so in the dry section of the cave. Being warm and dry, it was quite a pleasant location for photography, and conditions were certainly preferable to those on the surface. The passage is supposedly full of helictites, but we decided that the formations looked more like potato sprouts. Katie had



Drone view of Conrado Castillo. The PEP fieldhouse is barely visible in the lower right. BRYCE SMITH

FIELD HOUSE



PETER SPROUSE



ALEX SEATON



ALEX SEATON

a fancy SLR camera, which she was eager to test out. Since we were not in any hurry, we took our time and experimented with lighting and adjusting the various settings on the camera. Indeed, we took this to something of an extreme, and spent at least an hour photographing a tiny column. Eventually, Katie got sufficiently frustrated with this that we moved on to other subjects, of which there were plenty. While finding an endless supply of strange formations to photograph, our bladder capacity was limited so eventually decided to head for the entrance. The weather was still miserable on the surface, but at least there was good food to enjoy.

The 20th of December was a dross day, and I was ready for a break. The journey to underground camp was planned for the following day, so I opted to stay at the field house and make sure I was prepared. Peter ran the generator to ensure everyone had a chance to charge their batteries for lights etc., and I packed my gear for underground camp, and did some sewing to repair holes in my caving gear. This was also the day the remaining teams were due to arrive. They turned up over the course of the afternoon, and the field house was soon bustling.

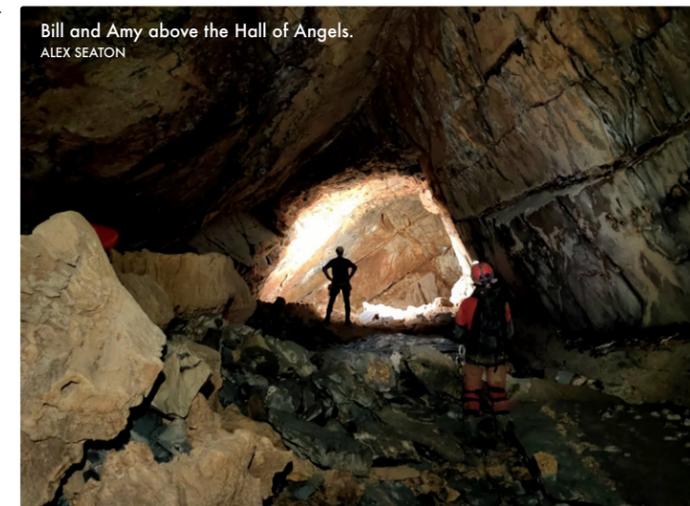
The following day began with yet more fun bowel-related issues, and also with the realisation that I was developing a cold. This wasn't great given that today was the day we had intended to travel down to Camp VII. After breakfast, Dan convened the Camp VII team for a meeting. With several of the group (Bill, Amy, Edgar, and Noel) having just arrived the previous night, it was decided that they would travel down the following day with Katie as a guide. Since I was not feeling well, I decided I would join them. However, with no major toilet issues over the next couple of hours, and not wanting to lose another day of potential caving, I changed my mind and prepared to travel with the team inbound that day. Our team (Osama, Géraldine, Colin, Dan, and me) set off around midday. The journey to Flowstone Falls went quickly and without incident. I arrived there with Dan and picked up some of the group gear that had been stashed. Dan stayed behind to wait for Osama and Géraldine, while I went on alone.

The route was clearly marked, but it was nevertheless eerie travelling on my own. Below Flowstone Falls, the way on is through The Canal. This consists of a long stretch of passage filled with deep water that requires either swimming or wading, with half to one meter of airspace. This makes it a rather ominous experience, particularly when alone. In one section, the passage narrows down to body width with perhaps 40 cm between the waterline and the ceiling. A large amount of air is forced through this constriction, producing a strong wind that hints at the vast expanse of cave beyond this point. I was glad to reach the end of The Canal, but although being somewhat less aqueous, the route goes through a series of tight constrictions that were tedious to pass with heavy bags. At some point I found Colin, who had gone ahead but then stopped to wait. He indicated the way on, and then went back to pick up more gear, despite already carrying more than I would have managed. Continuing farther, I eventually broke through into a large horizontal passage: the World Beyond. Colin had told me to wait for him there, so I used the opportunity to eat a cereal bar. He was soon back with another heavy pack, and we pressed on together. The rest of the route follows The World Beyond, which remains horizontal and of similar proportions throughout. The going was fairly easy, with long sections of swimming interrupted by brief portions walking along a stream.

Camp VII consists of about 100 m of dry passage that is lined with sand and breakdown. We quickly set about making camp more homely. To begin with, the contents of our bags were unpacked and arranged on one of the large flat rocks that acted as a store. Nearby, a smaller flat rock was made the dining table, with the rocks lying around it acting as convenient chairs. Arrayed around the passage near the dining table there were a series of relatively flat sandy areas, that would become the sleeping quarters. I hunted around for a suitable location and dumped my personal gear there. Still in my wetsuit, I was beginning to get cold, so I changed into my camp clothes, which had fortunately stayed dry during the journey. I then joined Colin and Dan, who had just arrived, in constructing the latrine. This was located some way back up the passage and consisted of a long trench in the sand, lined on either side with a series of flat rocks on which to squat. By the time we were finished, Osama and Géraldine had arrived, so we headed to the kitchen to prepare dinner. I realised at this point that I had foolishly neglected to bring any cutlery, but fortunately was able to borrow a fork from Géraldine. Our staple for the next few days was 'dinner mix' (DM), which came packed in Daren drums and was composed of ramen noodles, nuts, dried potato, textured vegetable protein (TVP), among other delicacies. Cooking dinner was a matter of spooning the desired quantity of DM into a bowl, choosing some toppings (fried bacon, dried vegetables, cheese, cheese powder, chile flakes, etc.), and adding boiling water. This made for a surprisingly enjoyable and versatile

meal, though I was warned that its novelty would likely wear off over the course of the week. Along with dinner, there were a wide variety of hot drinks on offer that included tea, coffee, hot chocolate, and various vitamin/electrolyte mixes. The combination of warm dry clothes and hot food and drink made camp feel very cosy. We sat and chatted for a while before retiring to our sleeping bags.

My watch alarm went off at 7:30 am on December 22nd, and I scrambled around in the dark trying to find where I had put it. It's a strange experience to wake up in the morning, completely unable to see in the pitch black. This also makes it important to put a light source within easy reach. Over the course of the next half hour, we gradually pulled ourselves out of our sleeping bags and made our way to the kitchen. Breakfast worked in the same way as dinner, but instead of DM, we had BM (breakfast mix). Breakfast mix consisted of dried beans, dried eggs, and nuts among other ingredients. This could be combined with the same toppings as were available for dinner and boiling water, and then complemented with a hearty mug of some hot drink. Over breakfast



Bill and Amy above the Hall of Angels. ALEX SEATON

we discussed the plan for the day. We would be continuing onward from camp, rigging the Angel's Staircase, and locating the leads that we would be exploring over the course of the next week. With breakfast finished, and having visited the latrine, I began the process of putting on my caving gear. Due to the temperature and humidity of the cave, this is a rather grim experience, since anything that gets wet simply remains wet (and cold). Putting on our wetsuits was therefore a necessary but unpleasant ritual that would have to be repeated daily. Nevertheless, we were soon ready to leave and headed

out of camp at 10 am. The way on from camp follows the same horizontal passage, which mercifully is mostly dry. This presents a welcome opportunity to generate some body heat from the exercise and warm up before (inevitably) getting wet later in the day. On the other hand, from camp onwards the passage is filled with a large amount of breakdown and mud and therefore involves a lot of tedium, negotiating large rocks and boulders. After perhaps half an hour, we reached the Hall of the Angels, with a huge flowstone formation that spans the height of the left wall. I'm not convinced of the resemblance to an angel, but it is nevertheless an impressive formation as by this point the passage is perhaps 30 m tall. The Angel is located above two side-passages that lead to sections of cave which trend aggressively downwards, and make up the bulk of the vertical distance towards the lower entrance of the cave. One of these, the Angel's Staircase, was the target for exploration from Camp VII.

We initially continued past the Angel and ended up in a section of fossil cave which we quickly realised was the wrong way. Retracing our steps we discovered the correct way on, almost exactly below the Angel. This leads to a small (~30 cm diameter) hole through flowstone, just above

the stream, which in turn leads to the beginning of the Angel's Staircase. From here onwards, the passage becomes very wet. The stream is followed for awhile, before it disappears down a small slot, and the human-passable route continues down large flowstone cascades interspersed between deep pools. Curiously, despite covering a lot of vertical distance, there are only a few sections of the Angel's Staircase requiring roped climbs. While this all made for very entertaining caving, being immersed in water quickly cooled us down. Since we had to stop at intervals to set bolts or rig ropes, this became a problem, and we tried various strategies to keep warm. Nevertheless, we made good progress and over the course of the next few hours rigged all of the way to the junction with the Ethiopian Sponge Tube. Along the way, Dan pointed out and flagged several of the leads, which we would be returning to over the course of the week. By this stage we were around 220 m vertically below camp and, conscious that it would take a while to return, began the ascent. Or at least all of us except Colin, who decided to continue on alone and rig the cave past the junction. As before I headed on up at my own pace while Dan stayed behind with Géraldine and Osama. Not wanting to get too far ahead, I took my time and used the opportunity to take some photos along the way. Reaching the top of the Angel's Staircase I was feeling pretty tired and slowly picked my way through the boulders back to camp. On reaching camp I was glad to see lights and hear voices of other cavers; the other half of the camping team had arrived (Bill, Amy, Edgar, and Noel), and had made themselves at home. I quickly changed into dry clothes and joined them for dinner while we waited for the others to arrive.

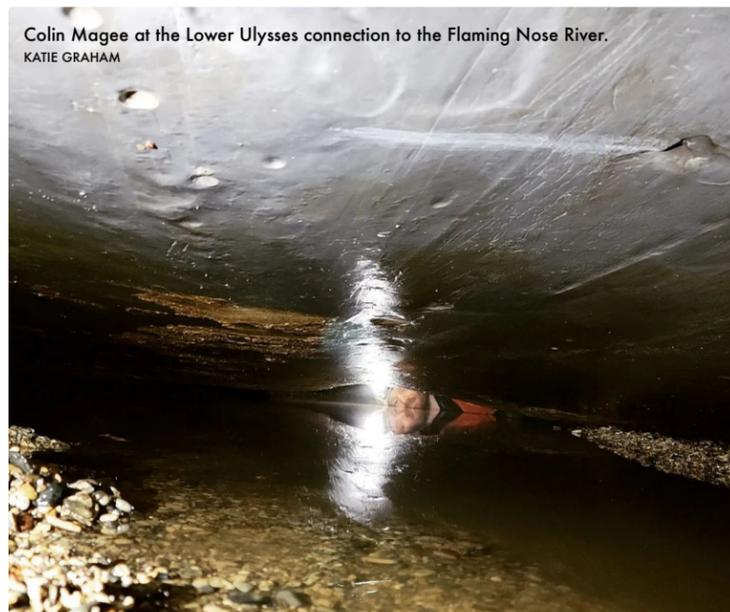


Bill in the Rio Verde.
ALEX SEATON

With the route down the Angel's Staircase rigged and the whole Camp VII team assembled, the next day started exploration in earnest. Over breakfast we discussed the options and split into three survey teams. I partnered up with Bill Stone and Amy Morton, with the objective of investigating the leads just above the junction for the Ethiopian Sponge Tube. The second team was composed of Osama, Géraldine, Noel, and Edgar, who opted for leads closer to camp, while the third team was made up of Colin and Katie. Dan wasn't feeling well, so he decided to stay behind and guard camp. We again set off at around 10 am and made our way through the World Beyond to the Hall of Angels and the Angel's Staircase. Our first lead was a tube leading due south, accessed via a slightly awkward 1-2 m climb out of a circular pool near survey station NB25. I led the way setting stations, while Bill took readings and Amy sketched. Bill and Amy took a fully digital approach to surveying, with Bill taking readings using a DistoX2 that was connected via Bluetooth to Amy's tablet. This made the process remarkably quick and efficient. Sadly, it turned out that this efficiency wasn't required for our lead. After a short hands and knees crawl, it forked into two even tighter passages. The right hand fork would have needed blasting for further progress, while the left hand fork led to a very tight squeeze that dropped into an upwards-trending passage. Being unsure that I'd be able to return if I were to squeeze through, I opted to leave this for someone braver than myself, or alternatively with the tools to enlarge the passage. We surveyed as far as we could and then retraced our steps to find the next lead. Since I had seen

an upward-trending passage, we figured that this might be accessed by one of the leads farther down the Angel's Staircase. However, after investigating lower down the cave, we didn't find anything that looked especially promising so instead headed back up, past our original lead towards another two at station NB17 that looked as though they might be worth pursuing. Along the way, we spotted a ceiling lead that was not marked in the survey. I negotiated a slightly sketchy climb to find a tube leading to another upward-trending passage. This turned out to have a survey station in it, and upon consulting the survey we realised it connected with Miz Pacman, a tributary to the Angel's Staircase.

We then continued on to the two leads at NB17. These were also heading south and were located within ~2 m vertically of one another. We began by examining the upper lead, which started with a short hands and knees crawl through to a 2 m drop into a 3-4 m diameter chamber. Since climbing down the drop was somewhat awkward, Bill and Amy



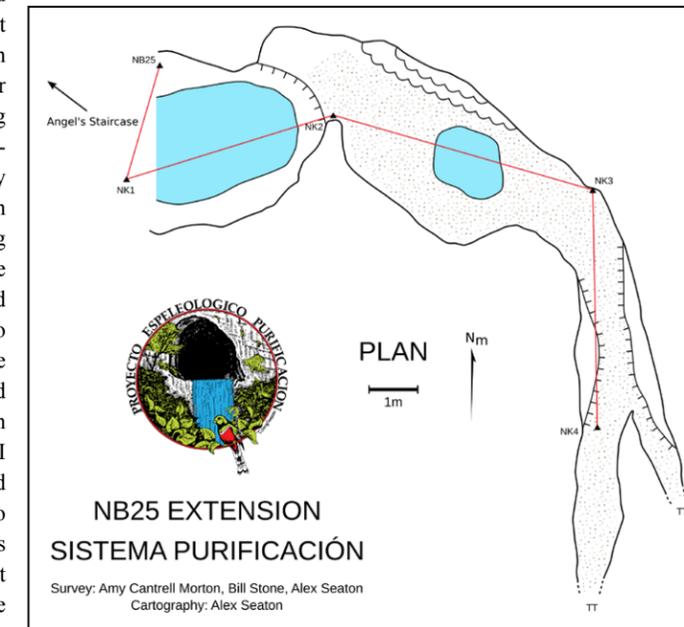
Colin Magee at the Lower Ulysses connection to the Flaming Nose River.
KATIE GRAHAM

stayed behind while I scouted ahead to check if it was worth surveying. There were three ways on. Straight ahead was a tight squeeze that I eventually negotiated but then became too tight. Two meters up the wall of the chamber was another route leading forward which also became too tight to follow. Finally, on the right-hand side of the chamber, another tube led off forward (southward). This turned out to be passable and, though quite tight, continued for some distance until dropping into another upward-trending passageway. To my dismay however, directly in front of me on the ceiling was a piece of flagging tape with a survey station marked NB125. After returning to Bill & Amy, we consulted the survey and realised we had found another connection into Miz Pacman. While I had been gone, Amy had made use of the time to explore the lower lead. This went into a crawlway that went a short distance before terminating in a mud choke.

She somehow managed to persuade me to join her in surveying it, before we retreated and joined Bill. By that point, Bill was getting cold, and I was tired of squeezing through tight spaces and shredding my wetsuit on the razor-sharp rock. In any case, it was around 4:30 pm, so a reasonable time to start heading back to camp. We set off and arrived at around 7 pm, with Katie and Colin arriving a short while later and Osama's team turned up at 9:30 pm.

The plans for the next day slowly crystallised over breakfast. Dan was still feeling unwell and opted to travel to the surface, so Osama and Edgar kindly offered to help him as far as the Crack of Doom. Bill and Géraldine were reluctant to travel down the Angel's Staircase and teamed up with Noel to do a thorough investigation of The World Beyond and try finding leads near camp. I was still keen to continue working on the leads in the Angel's Staircase, despite the somewhat disappointing finds the previous day. Fortunately, on our way back to camp the previous day, Amy had spotted a lead just above Gonzo Pit which looked promising. Since neither of us were especially keen to travel to deeper leads with Colin and Katie, we opted to investigate this. We set off at around 11 am after a relatively protracted session of faffing around at camp. Since there were just two of us, travel was quick and we arrived at the lead in about an hour. Our lead began at the large pool immediately before Gonzo Pit, but heading northwest and almost directly away from Gonzo. The passage sloped upwards and narrowed to a hands and knees crawl until it promptly ended in a ~1.5 m drop into a pool that filled a small chamber about 7 m long and 3 m wide. The water initially had a beautiful clear blue colour, though this quickly turned brown and murky once we climbed down into it and

encountered the thick viscous mud at the bottom. This turned out to be a sign of things to come: the way on south was lined with a generous coating of mud. To make things worse, it quickly narrowed to a flat-out crawl. Travelling through this was bad enough, but we had to somehow survey as we went. I was impressed by Amy's ability to keep her



tablet largely mud-free under such conditions. After squirming through the mud for a while, the passage finally relented and took on more comfortable dimensions. This wasn't ideal however, as it immediately dropped about 3 m. Being coated in a thick layer of slippery mud, we grudgingly came to the decision that it might be wise to rig a handline. Which of course meant travelling back through the mud to grab a rope that we had stashed nearby the previous day. With the rope recovered, we returned to the push. While considering our options for rigging the rope, we heard some peculiar noises, almost like a clock ticking. We managed to find a natural anchor for the rope and were soon in a small chamber at the bottom of the drop. There were two ways on, one to the left and one to the right. We opted

to take the right-hand route first, and were immediately rewarded with a small muddy puddle in which we could wash the worst of the mud from ourselves. Continuing on, the passage narrowed and headed northwest again. After a slight bend it then forked, with both routes immediately dropping into pitches. Since neither of these looked safe to free climb, and we didn't have another rope, we were forced to turn around. Returning to the chamber, we then attempted the left-hand route. While having noticeable airflow, this quickly reached a constriction that we couldn't pass.

By this time it was around 4:30 pm, and having again been crawling through tight spaces for several hours we were in no mood to try other leads. So we called it a day and began the journey back to camp. We briefly paused in the first chamber with the muddy pool for some photos to illustrate our plight. We were glad of the plentiful opportunities on the way back to camp to dunk ourselves in water so that by the time we reached the end of the Angel's Staircase, we were relatively clean. Here, the source of the strange ticking noise we had heard earlier became apparent, as the constriction leading out of the Angel's Staircase was considerably larger than it had been in the morning. Bill would certainly be pleased.

Christmas Day began with the usual consumption of large quantities of breakfast mix. Colin and Katie wanted to travel down to a lead in the Ulysses passages, and were keen to have more cavers on their team. I was tempted to join them but, on consulting the survey and realising quite how far they intended to go, decided that would be a bad idea. Instead, I teamed up with Bill, Amy, and Géraldine for a luxurious day of caving in the dry passages above the Angel's Staircase. Bill had an-



The Camp VII kitchen. L-R: Noel Vazquez, Osama Gobara, Colin Magee, Katie Graham, Edgar Garcia, Géraldine Solignac, Bill Stone, Amy Morton.
ALEX SEATON

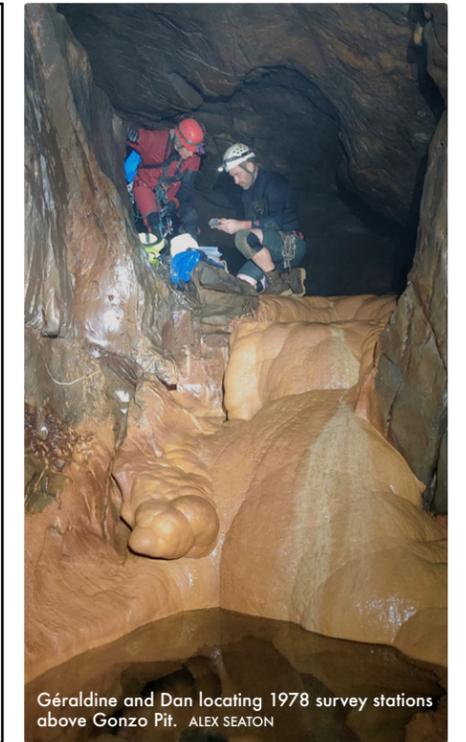
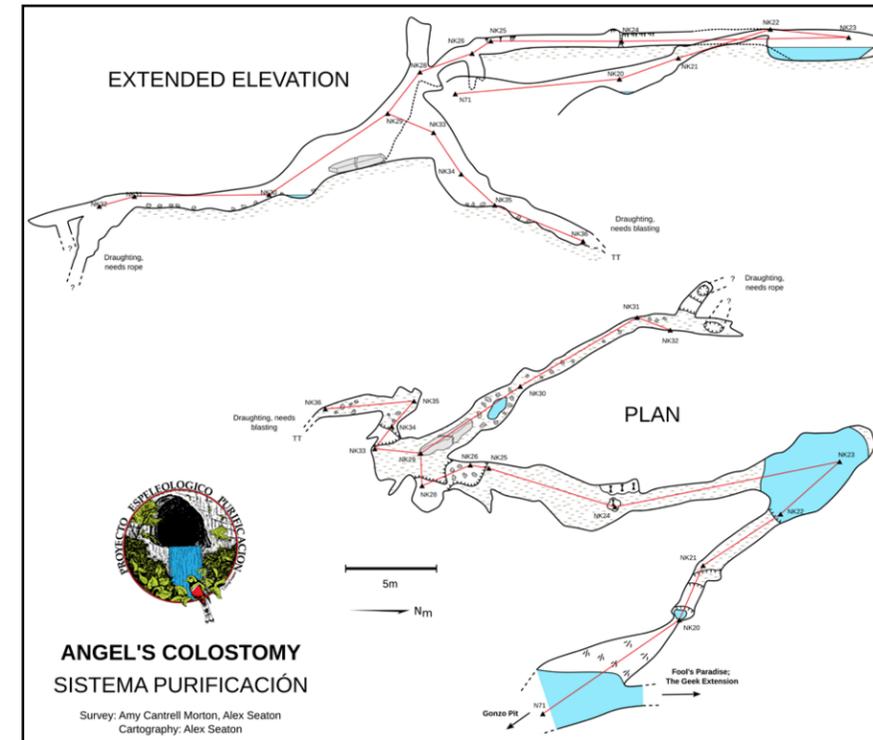
other section of cave he wanted to scour for leads, so we changed into our caving gear and were ready to set off at around 11:30 am. Bill's idea was to explore the Travertine Trail, another passage leading off from below the Angel formation. He explained that this was the original route leading to Infiernillo, so this was a good opportunity to see a different section of the cave. The route trended north, away from the Angel, via a horizontal passage that descends gradually via a couple of short drops. We spent a little time rigging the first, where the passage enlarged somewhat. On the right was a large window, perhaps 3 m up on the wall, which was marked as a going lead on the survey. Unfortunately though, there was no straightforward way to access it without a bolt climb, and we weren't equipped for that. Continuing on along the passage was a large 2-3 m drop, which also looked like it needed rope. Luckily, while the others were deliberating over how to rig this, I found a tube leading out of the floor behind them that bypassed the drop. Continuing on again we reached an abrupt turn in the passage about 100 m into the Travertine Trail. This was where cave begins trending north towards Infiernillo. The passage also opened up dramatically into a large 20 m diameter chamber with a 30 m drop down a flowstone cascade. This was still rigged from years before, though the rope had clearly suffered from several floods and was badly damaged - yet another reminder of how violently the cave responds to wet weather. We pulled out the old rope and salvaged a couple of intact sections, before placing a bolt and rigging our own rope. At the bottom of the drop, we continued through the chamber. We spent a while looking

for leads, but despite attempting some slightly sketchy climbs into enticing looking voids, we didn't find any new passages. The next drop was again about 30 m down a flowstone cascade, but since we didn't have the rope for this and a through trip to Infiernillo was in any case not our objective, we stopped there. Nevertheless, it was a strange feeling peering down into the darkness knowing that, in principle, the Camp I team and gaping Infiernillo entrance were 8 hours (or so) hard caving away. Bill recalled doing a through trip from Infiernillo where one of his companions had forgotten to rig this drop beforehand, so that they had to free-climb it. It didn't sound like much fun. Having seen some of the more awe-inspiring sections of the cave, we turned around and started heading back, scouting for leads. Serendipitously, I spotted another window next to the first drop we had come down. It was also quite high up, but there was a large flowstone mound that we could climb up. From the pinnacle of the flowstone mound, it was a large step across to reach the window. Bill suggested we put in a bolt out of an abundance of caution, and being the fool to first make the move, I was glad we did.

Stepping across, I found myself in a large tube, which dropped down a little and then branched into two separate routes. The right-hand route involved a climb, so I decided against this and instead headed into the left-hand passage. While the passage was fairly impressive



First place in the Conrado Castillo selfie contest.
ALEX SEATON

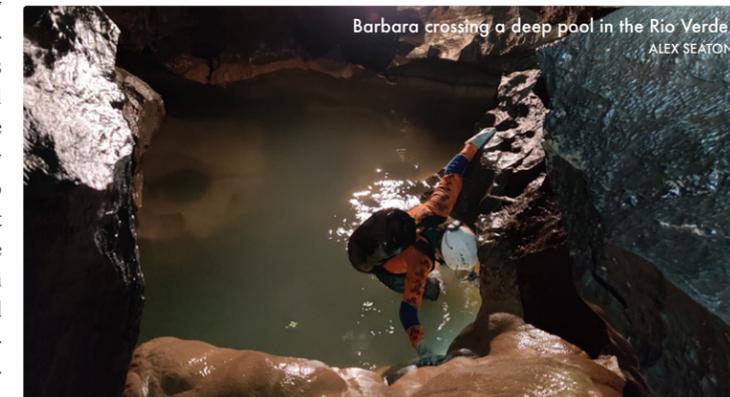


Géraldine and Dan locating 1978 survey stations above Gonzo Pit. ALEX SEATON

in size, I was disappointed to see footprints indicating that people had been there before. Why hadn't they surveyed it? I followed the passage for about 30 m to where it abruptly closed down at a large flowstone formation. At the top of this, a small, roughly 1 m diameter slot was visible leading off. Somewhat conscious of being on my own and that the others were waiting, I climbed the flowstone and pushed through the tube. It immediately opened up into a vast chamber. Being a pessimist, I got the feeling this was far too good to be true, a feeling which was quickly validated by my sighting of the 'Angel' formation. All we'd found was another route from the Hall of Angels to the Travertine Trail. I quickly made my way through the Hall of Angels to the Travertine Trail and met up with the others. Despite our 'find' having already been visited, we decided we had better survey it to prevent others thinking it was still a going lead. Since the step across from the flowstone was slightly risky, we also decided to travel via the Hall of Angels. Making our way around, the others realised that the right-hand fork I had spotted was in fact the route we had mistaken for the route into the Angel's Staircase on the rigging trip a few days earlier. Which meant that the footsteps I had spotted and been grumbling about might have been my own! The survey process went smoothly; it was a pleasant change not to be crawling through mud. We first surveyed down the left-hand route, before completing the job with the right-hand route. This turned

out to have quite a few formations, so I took the opportunity to get some photos. Then as it was getting late we headed back to camp and arrived at around 7:30 pm, with Osama's team arriving shortly afterwards. We sat around and waited for Colin and Katie to arrive. By 10 pm we were getting a little concerned, but as there wasn't anything we could do, opted to go to bed. Naturally, they arrived just as I was getting to sleep.

My strategy of avoiding tough caving trips with Katie and Colin finally failed. With Amy and Bill keen on a bolt climb in the World Beyond, and Osama and Géraldine set on dry caving, I was drafted to help investigate the lead in the Ethiopian Sponge Tube. Caving with Colin and Katie was a sobering experience. I more or less managed to keep up with them through the World Beyond and the Hall of Angels, but was left in the dust travelling down the Angel's Staircase. This was even more



Barbara crossing a deep pool in the Rio Verde.
ALEX SEATON

impressive given that Colin was carrying a huge bag with bolting and blasting gear, and Katie was similarly encumbered with rope. Nevertheless, they were gracious and waited for me at strategic locations where there were trickier sections of cave to negotiate. We were soon at the junction for the Ethiopian Sponge Tube, and Colin began bolting his way down it. The Ethiopian Sponge Tube descended much more steeply than the Angel's Staircase, so we had to rig ropes along most of the route which meant plenty of waiting around. Nevertheless, after some

cursing from Colin on the last pitch, we were finally at the bottom in a small horizontal passage which had a large pool conveniently located where the rope came down. Mercifully, as by this point we were pretty cold, the pool was only thigh deep, so we avoided getting completely soaked. From the pool, the passage continued to the north and south. We initially went north by accident, but soon realised that the lead was in the opposite direction. Crossing back across the pool, we traipsed through some mud and followed the passage toward the lead. The lead itself was a solutional pocket above the main passage. In the survey, the main passage was drawn sumped, and the pocket was described as needing blasting. But it quickly became apparent that the water level was lower this time around, and that we could just walk through without needing to blast anything. While this meant that we would be able to progress much more quickly, it was frustrating to have carried all of the blasting gear down for naught. We took a quick break before getting started with the survey. Colin and Katie had a good system for surveying as a pair, so they sent me to scout on ahead. The passage continued awhile before dropping in height to a flat out crawl over some rather

required wading waist-deep through cold water, I made my way back to them to wait for them to catch up. Colin had just reached the squeeze that I had opted to avoid, and was making his way through. Several choice words were uttered, which I shall leave to the reader's imagination. After a short period, the survey had advanced into the stream passage. Having been sitting around surveying and getting cold, Colin and Katie weren't especially pleased with the prospect of surveying in waist-deep cold water. Nevertheless, they began making their way up the upstream passage, and sent me farther along to investigate. Following it a while, I reached what was either a duck or a sump and turned back to head for the downstream route. While not waist-deep, this was similarly grim. It required hands and knees crawling over sharp 'popcorn' (calcite formations) in elbow-deep water. That said, it didn't seem to end any time soon, and had some airflow. I continued a while before getting bored and turning back. On the way back I tried to measure the distance I had travelled, and came up with a figure of 120 'crawl movements'. The conversion from crawl movements to meters is non-trivial, but I estimate 30-60 m. I reported my findings to the others, and we



Katie, Dan and Colin test the new field house porch before a Camp VII supply run. PETER SPROUSE

unpleasant knobbly rock. This I later learned is referred to as 'death coral', and is apparently a common feature in Sistema Purificación. I decided against attempting the squeeze and headed back. Fortunately, another option presented itself: a muddy tube that led off to the side of the main passage, and provided a route that bypassed the squeeze. The passage gradually widened until it reached a sandy bank that descended under where the ceiling dropped down. Sliding down the bank, I ducked under the ceiling and found myself in a decent sized chamber with a stream running through it. The geometry of the place was a bit peculiar, but essentially the passage we had been following forked, with the left fork leading upstream, and the right fork leading downstream. I followed the upstream passage a little, and was surprised to find some shredded plastic from a bag, and other pieces of man-made detritus. Since the others were a way behind, and travelling along the stream

discussed our next steps. It was around 7:30 pm and we were all getting cold, so it was time to head back. As the slowest person, I was sent on ahead while Colin and Katie derigged the rope behind me. I seem to remember helping out by carrying some of the rope, but this might be wishful thinking. The route back was straightforward, but long. Some way past the top of the Ethiopian Sponge Tube, the others overtook me, leaving me to travel at my own pace. I was getting pretty tired by this point; the Angel's Staircase seemed to go on forever, and what had been a sporting series of short free-climbs earlier in the week became a taxing endurance challenge. I focused on making steady, efficient progress. Eventually, I made it to the (enlarged) squeeze just below the Angel, and was glad to see Colin and Katie waiting. While exhausted, I was relieved to be past the most difficult parts of the route, and we made our way back together to camp. We finally arrived at 11:30 pm,

and changed out of our wetsuits into warm, dry clothes. We then wolfed down some dinner mix before heading to bed.

I woke feeling broken after the previous day's exploits. This would need to be a rest day. Or at least, that was my naïve plan. Over breakfast it emerged that there were a couple of teams heading down from the surface to see Camp VII and bring some of the group gear out of the cave. As a result, and since we didn't have any particularly good leads lined up, the majority of the Camp VII team opted to follow them out to the surface. Not wanting to sit around waiting for a day only to be travelling out the next, I decided I may as well join the outbound team. In contrast, Colin and Katie opted for another day of brutal caving, while Osama stayed behind with Noel to make another attempt on their lead from the first day. So I packed up my gear and pulled on my nice cold, wet wetsuit, which by this point was also developing some interesting odours. Dan had arrived at 11:30 am with Mowgli and Ethan, and loaded themselves up with gear before heading out. They were followed by Bev, Matt, and Nancy, who dispatched much of

to head out. After taking an excessive amount of time to change into my dry caving gear while Géraldine and Edgar sat in their wetsuits shivering, we set off on the final stretch. We made good progress, and after a mercifully short period of time were at the Brinco entrance.

It was a huge relief to be out of the cave, though it was after sunset and turned out to be pretty cold on the surface, so we hurried up the hill towards the fieldhouse. Thankfully, it was quiet when we arrived, so we changed into warm non-caving clothes and piled inside. The wood stove was going, making the place rather cosy, and Cathy kindly had some food ready which we devoured in no time. Still hungry, Edgar generously cooked us some barbacoa tacos, which were also well received. We sat around for a while chatting, and drinking a quick beer before heading for bed.

After a very deep and lengthy sleep, I woke at around 9 am determined to have a lazy day. I had missed breakfast but put together a luxurious egg, chopped tomato and summer sausage combination as per Géral-

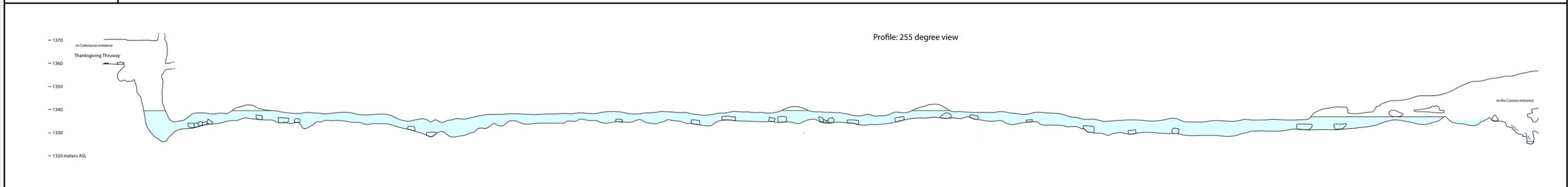
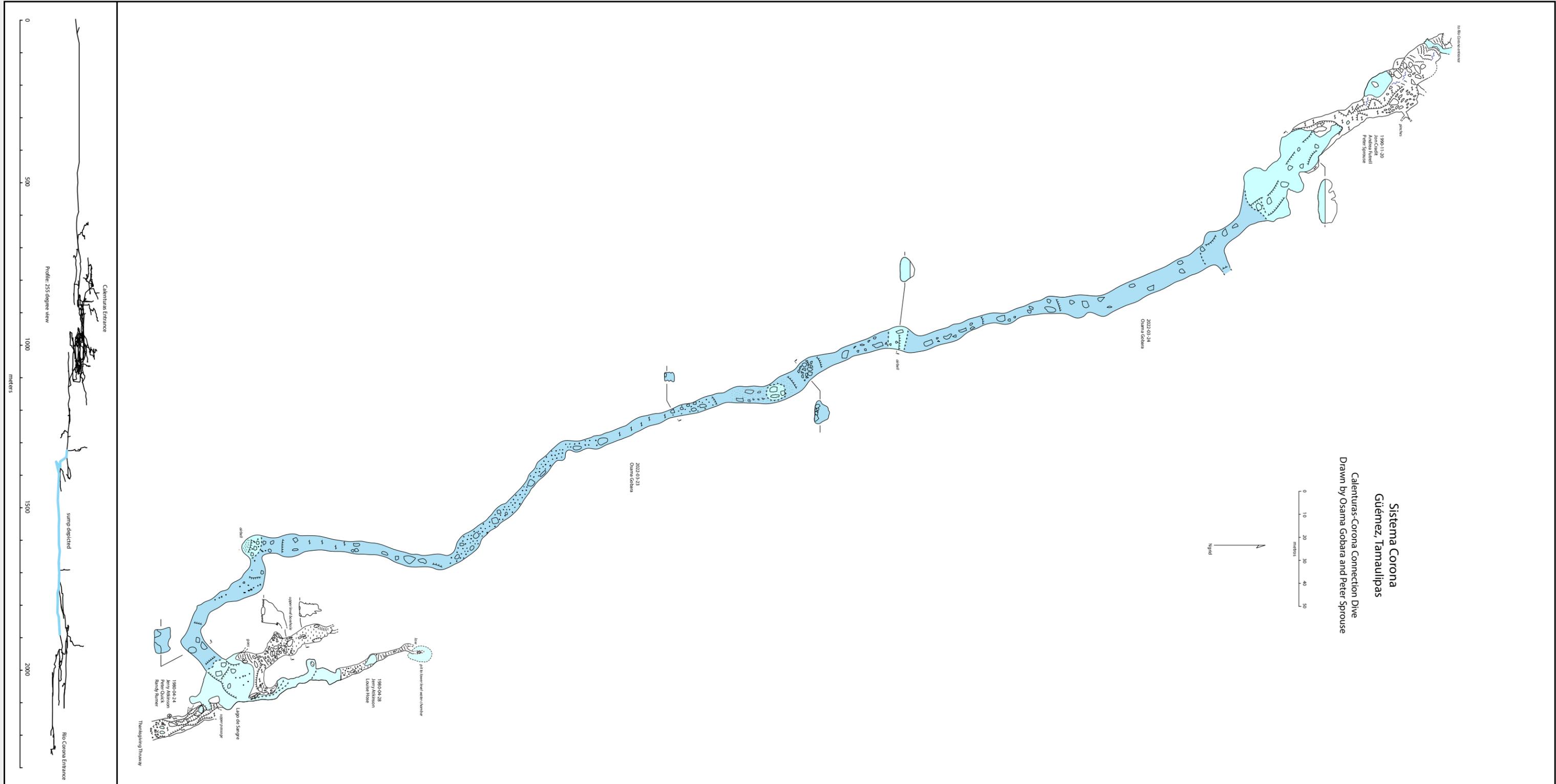


Abigail, Cait, Isa and Chelsea. ABIGAIL MACK

the remaining group gear. With most of the group gear already taken, I was relieved and rather grateful to find myself with only my personal camping gear to bring out of the cave. I turned out not to be quite as tired as I had thought. That said, the route out was much more tedious than I remembered from the way in. The swims through the World Beyond were particularly unpleasant, as were the tight passages we had to negotiate afterwards. With a fairly large group, progress was relatively slow, and we got quite cold. In The Canal this became acute, though thankfully past Flowstone Falls the pace picked up and we managed to warm up. We were soon at the Crack of Doom, and with some teamwork and grim determination passed the packs through. In the Changing Room, the team divided in two. Bill and Amy decided they would camp there for the night and take a shot at enlarging the Crack of Doom in the morning. This left Géraldine, Edgar, and me

dine's suggestion which did the trick. After breakfast, I slowly set about putting my caving and underground camping gear out to dry. Bill and Amy arrived at around midday, with news that the awkward flowstone chute before The Crack of Doom had been obliterated. Unfortunately, they didn't have a long enough cable to with the rest of The Crack, so that remained intact. Nevertheless, I'm sure the changes they had made would be much appreciated by many future cavers. Later in the afternoon, Colin and Katie arrived, with Osama and Noel turning up somewhat later. Finally, the Infiernillo Camp I team showed up in the evening in the trucks and the fieldhouse was soon bustling. Over the course of the evening we ate far too much, and learnt what the other teams had been up to.

I spent the next two days lounging around the fieldhouse, eating vast



quantities of Nutella, and generally being lazy. Peter ran a couple of ridge-walking trips to investigate and dig some potential cave entrances, and we began the process of packing and readying the field house for our departure. The groups that had arrived later in the expedition also left early, so the field house quieted down somewhat. The overall surveys in various parts of Sistema Purificación on this trip resulted in 2409 m of survey, bringing the cave length to 97,409 m.

On 31st of December it was finally time to leave and head back toward Monterrey. We made some final preparations before locking up the field

house and heading out onto the logging roads back to civilisation. Isa had somehow persuaded one of her friends to cook us a local specialty (discada) which we pigged out on while also working our way through a large quantity of beer. After only a few hours' sleep, we said goodbye to our Mexican friends and headed north to Texas. In the border queue Peter's truck overheated, so we had to use Abigail's to tow it across the border. The customs officer seemed confused at having a British citizen crossing the border, asking me "what is your purpose?" - a question to which I'm still struggling to find a satisfactory answer.

Cuchilla, Allarines and Oyamel

December 2021

by Bev Shade

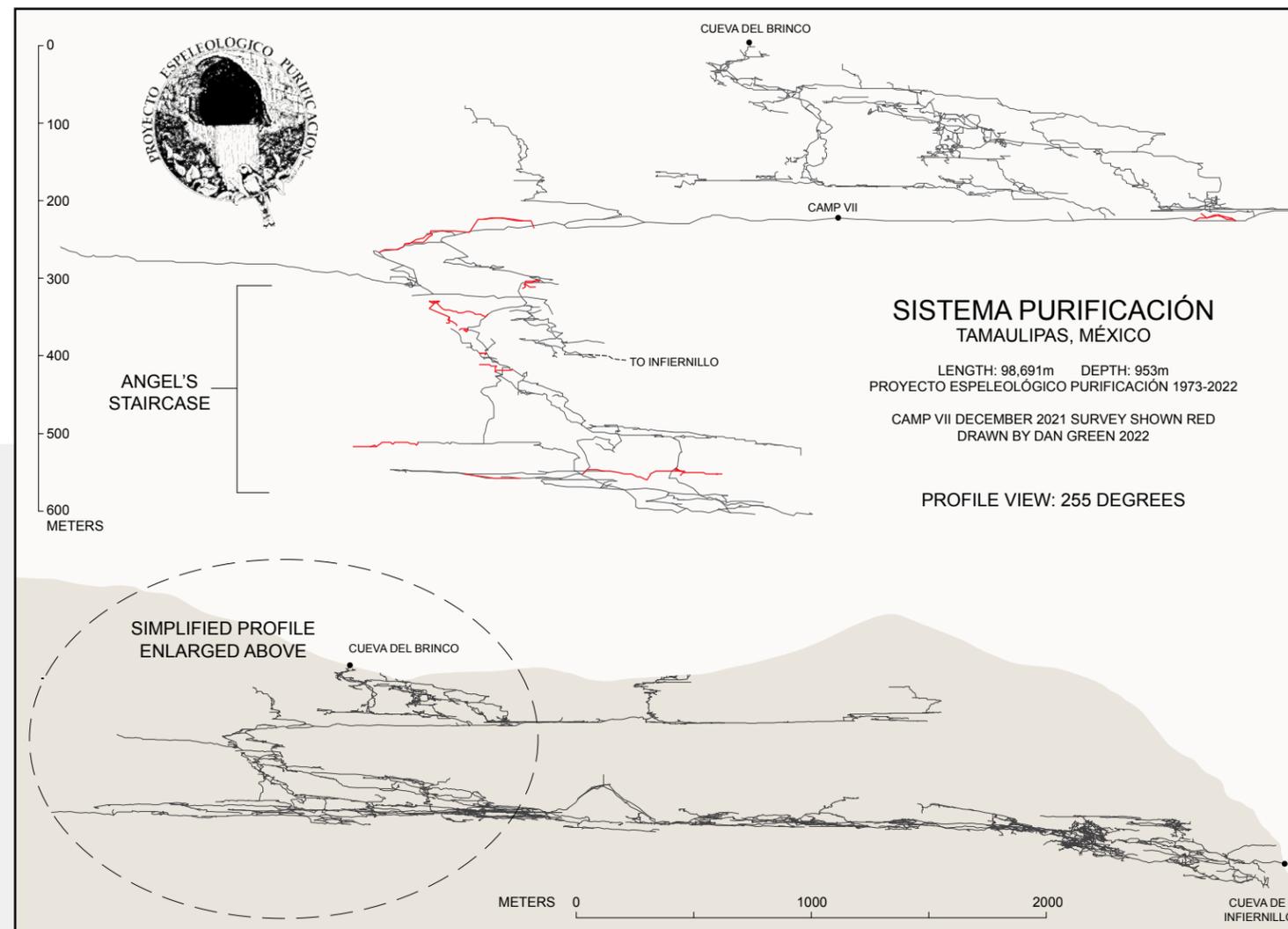
THE LAST TIME I'd been in Cuchilla was 2004. After 17 years, I was curious to look at the bottom of the cave with fresh eyes. Considering that several significant hurricanes have landed in the region in that time, it's possible that the digs in the bottom of the cave might look different, or we might notice a lead that we missed previously. The point of pushing Cuchilla is that it's only 49 meters above the upstream end of the Dragon River, and follows a similar trend. The entrance of the cave is located at 2108 m elevation, 132 m above the current high point (station VB33). A connection between Cuchilla and the main system would put the total system depth at 1088 m, not to mention adding almost 3 km of length.

In any case, the bottom of the cave is a bit of a fracture maze, and as years of digging have demonstrated, the only time to search for the way on will be when there's strong airflow. When I first started working in the cave (1995-ish), we were digging in the Hurricane Crawl, and it lived up to its name with a strong breeze keeping us chilly as we lay on our bellies in the water for hours. Unfortunately, since we broke through in July of 1997, there has not been good airflow when we were present. This might be a coincidence of rainfall periodically sumping small passages like the Hurricane Crawl, or it might be due to a permanent change deeper in the cave, like a big bank of sediment stirred up by a major storm, blocking circulation between Oyamel and upstream Dragon River, or a collapse with similar results.



Christmas can be a decent time for lower water levels since the hurricane season is over in the Gulf of Mexico and a low risk of flooding with summer storms. Spring is probably a better time, but these days I'm in Oaxaca in spring. So one of my prime objectives for this trip was to check airflow in the bottom of the cave. Spoiler alert: we rigged the cave and the Hurricane Crawl had a bunch of water in it, and not a breath of air. It was disappointing, but caving is a long game. It's still worth checking anytime anyone is at Conrado Castillo.

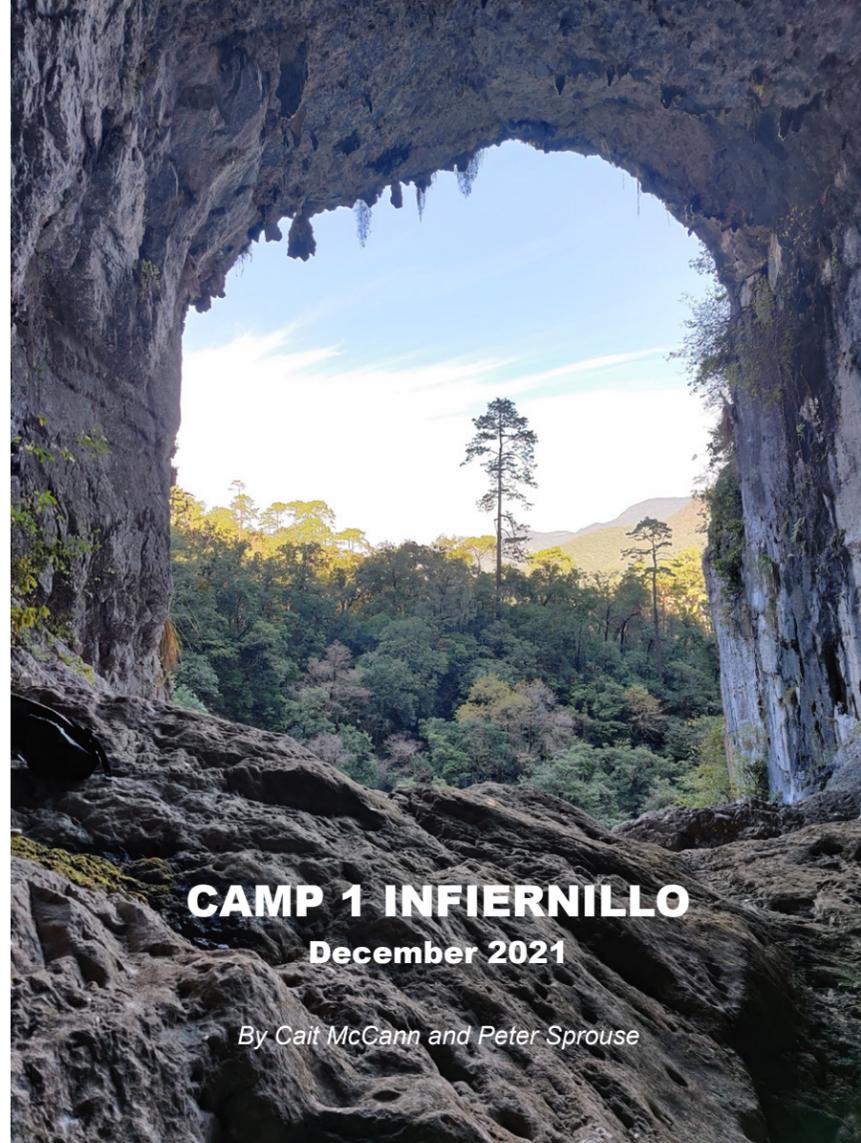
Rigging notes: fresh ropes are stage derigged on all drops except the entrance. Deviation slings should be in place, but it never hurts to bring a couple of extras. Bring a rope for the entrance: 25 m should be more than enough. Also there's a rigging list on the back of the fieldhouse door! All hardware was removed from the cave: bring a handful of biners for deviations, and about 40 hangers and maillons. All good bolts should have a nut on them - bad bolts should not have nuts. The traverse above Snow Drop could use improvement, which will use 2-4 new anchors (maybe long bolts in the crappy rock) and perhaps 15 m of rope.



Another long term project of mine has been to connect Allarines to Oyamel. On this expedition we made 2 trips to the bottom of Allarines: one to assess the potential dig below the Tentacle Chamber, and another to dig there. This lead has been bugging me since December of 2006, so it was gratifying to finally return. The dig site I had in mind was a clean washed bedrock crevice, taking a small stream that dropped several meters out of sight. It looked good but once again we had no airflow, which was discouraging. We dug through a small bedrock window and bypassed the crevice, yay! The window opened into a short down climb and then to a lovely room 3 meters tall and clear blue pool 2 m deep. Wow! Unfortunately, the pool is due to a big gravel bank blocking the passage on. At low flows, the water is able to trickle through, certainly to a passage that leads to Oyamel. At higher flows, the water clearly backs up into the silt and debris-choked Walking Passage, My Ass! crawlway. Maybe someday a really big storm will blow out all the sediment and open the passage. We did not bring survey gear on the digging trip. The passage is quite unpleasant, so we were trying to minimize bag size. So, a motivated and crawl-loving survey team could make Allarines a few meters longer and deeper.

Connecting Allarines and Oyamel would be simplest from the Allarines side, since there's only one passage and we'd be going down potential pits instead of up, but it's not the only option. Undeterred, we started methodically scouring the middle part of Oyamel for any upstream leads. Finding stations from 1979 could be challenge enough, but Oyamel lies in the floor of a drainage that takes a lot of water at times, and it's clear that the passage floods regularly. However, drilled stations and good sketching saved the day! We found an original station just a few meters from our first lead, and were able to start mapping right away. We pushed three leads near Anchovy Pit for a meager 134 meters of passage, every meter hard-won. Future teams could pick up with any leads below KB36.

We did some ridgewalking as well, including a pretty thorough grid search of the western slope of Picacho del Vaquerillo but did not find anything significant.



CAMP 1 INFIERNILLO December 2021

By Cait McCann and Peter Sprouse

ALEX SEATON

IT HAD BEEN 15 years since anyone had been to Camp I in Infiernillo. We were keen to see what the camp looked like and to push some of the 373 leads in the Confusion Tubes section of the cave. On 22 December, having rigged the entrance the week before, we loaded up three trucks at the fieldhouse, and eleven of us drove down via Galindo. We parked along the road where the washed-out gully prevented further driving, then backpacked to the cave. It was lovely to walk among enormous moss-covered rocks, contrasted by the beautifully steep limestone walls that rose up the side of the canyon. When all 11 of us reached the entrance, we climbed the rope that Dan Green had rigged a week before, earning himself some poison ivy. We hauled packs up a separate angled taut line using a pulley and a haul line. By 8:00 pm we were heading into Camp I where we cooked dinner then dug a latrine trench. Fortunately, in the week since we had done our rigging trip, the sump levels had dropped enough that the latrine area was dry.

Peter and Abigail, the early risers, began making tea around the big rock that serves at the kitchen, and little by little the rest began to stir. Ethan and Sean had come along with us on a short mission, to try and enlarge the blowing breakdown choke in Moria. This lead was near the sump called the Black Lagoon, and seemed to have good potential for a

breakout. But when they got there they found that it was underwater. It would have to be a project for a drier time of the year. So they ended up leaving the cave to return to projects in Conrado Castillo.

The rest of us spent the first day orienting ourselves in the Western Confusion Tubes. Peter did fine leading the group up to the Balcony Borehole via the East Loop trade route. Beyond that his recollection of the way on to the Misty Borehole and Ithilien was vague, as it had been many years. We navigated by using a line plot on our phones and searching for marked stations in this complex area. But a mis-labelled station at a junction confused us for a few hours til we realized what was going on. After that we were able to find our way through the Off the Track Tube and Mrs. Lubner's Tube down to the Misty Borehole. We were left with just enough time to get a little survey done for the first day. We made it back to camp around 8 pm, and made good use of the shower bag that Peter had set up.

Day 2 got off to a slow start. While chewing on a breakfast of Cheve breakfast mix (a motley combination of freeze-dried eggs, beans, coconut, chia seeds and cashews) we formulated a plan to head back to the Misty Borehole area. Ben, Cruz, and Barbara bolted across the top of a drop over the Misty Borehole to ongoing passage, which connected

to Misty Pit. Abigail and Peter located the way on to Ithilien, but there was a rope to climb, and they had left their vertical gear behind. So they mapped a small tube, and turned around in a larger one, which continued.

Chelsea, Victoria, and Cait continued mapping in the Typical Tubes area, where they had started the day before. They ended up looping over to the passage where Abigail and Peter were working, getting within shouting distance of the other team. Previous survey teams had used a small hand drill and hammer to mark stations in addition to carbide soot. These amounted to just a little hole in the wall - but we were so grateful for those holes! Finding two or three in a row meant that we could identify where we were on the line plot and add to the map without duplicating effort. We spiced up the Cheve dinner mix with extra cheese, chiles, Knorr bouillon cubes and more - a Christmas Eve special, complete with candles around the kitchen rock, a little spiked Tang, and caroling. Dessert was one Gloria cajeta candy for each member. A festive night!

One of our main goals was to push a promising lead to the south from an area called the Meager Borehole. To that end on Christmas Day Abigail and Ben re-marked stations to the south end of Ithilien, but stopped there due to a fixed rope on a climb that was in poor condition. Barb, Cruz, and Victoria finished up leads in the Misty Pit area. Cait and Chelsea went to a lead that connected back to the Typical Tubes, with Chelsea taking on the sketching for the day. We sang carols all the way home.

Day four started with the "Poop Woop", a new technological advancement. There was always a line at the entrance to the latrine passage each morning. To speed things up, everyone was asked to let out a woop! as soon as they finished their business so that the next person could start heading into the passage, which involved negotiating a few obstacles. On this fourth survey day Ben and Abigail went back out to Ithilien to try and get to the Meager Borehole, but ended up at the bottom of the Jello Well instead of the top of it as planned. But their efforts over the last few days had re-marked a lot of stations, so route finding will be easier next time. Cruz, Chelsea, and Victoria went along, and mapped side leads off Ithilien. In the Eastern Confusion Tubes Barb and Isabel mapped some loops off the Enchilada Tube that went up and to the southeast and eventually tied into known passage. Cait and Peter mapped a number of loops in that same area such as the Tostada Tube, Trompo Tube, Pirata Tube, and the Thin Ice Tube. They had a fun time navigating the nearly vertical Ghost Tube on the way back to meet up with Isa and Barb. As our time in the cave drew closer to an end, we polished off the last block of Dubliner cheese and used extra tape on our blistered feet, happy to share stories of the cave before falling into bed.

On our last survey day Barb and Abigail returned to the Eastern Tubes and mapped off of the Tortilla Tube, tying into Too Tube and Enchilada Tube. Cait, Chelsea and Victoria were keen to head out to the Western Confusion Tubes again. Victoria took on the sketching for the day and found a great spot to start where we left off in the "Lords a Leaping/ Caballeros Brincando" passage. It wasn't too tight or too complex, but it had enough challenging spots for Victoria to learn more symbols as the day went on. At station 181XN they added new stations and named the new passage "French Hens/ Gallinas Francesas." Victoria made a great sketch, clear and tidy.

Peter, Cruz, Isa and Ben stayed in camp, listening to their respective sore knees, terrible blisters, friction-burned legs, and general exhaustion. Ben started to aid climb the dome above Camp I, but found existing bolts, showing that it had already been done. Then Ben, Cruz, Isabel and Peter went out to the entrance to ferry some gear, and Ben installed a bolt ladder on the lower part of the ledge drop to aid future rigging chores. They also placed a bolt at the top of the main drop to make that easier to negotiate.



Isa in the Confusion Tubes.
BARBARA LUKE



Barbara ascends into Infiernillo.
PETER SPROUSE



Cruz and Ben rigging the traverse over the Misty Borehole.
BARBARA LUKE

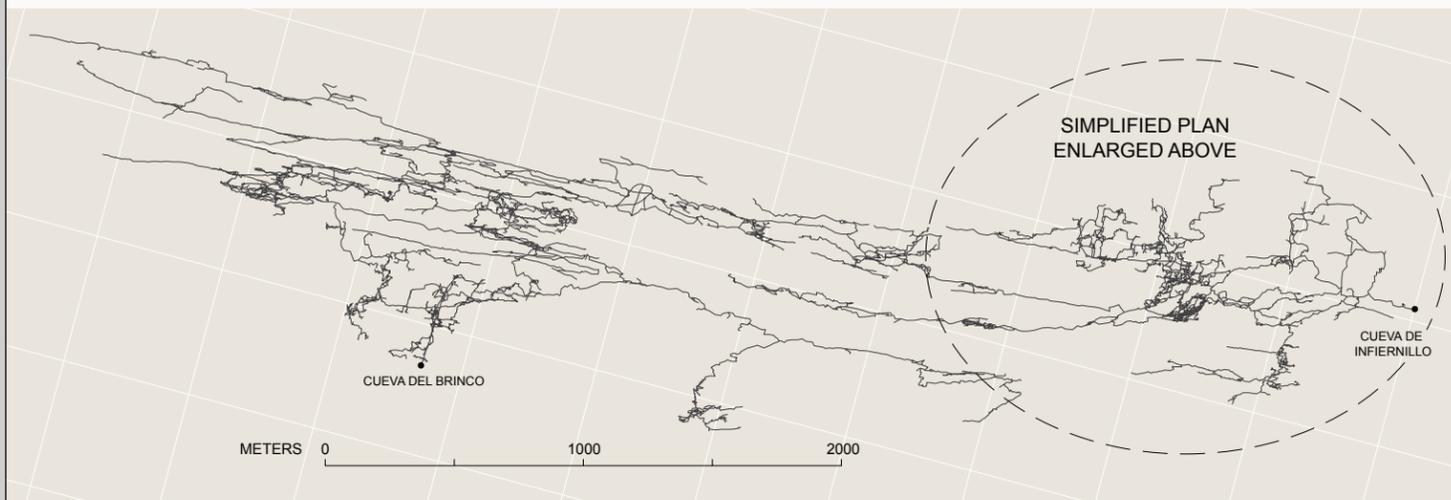
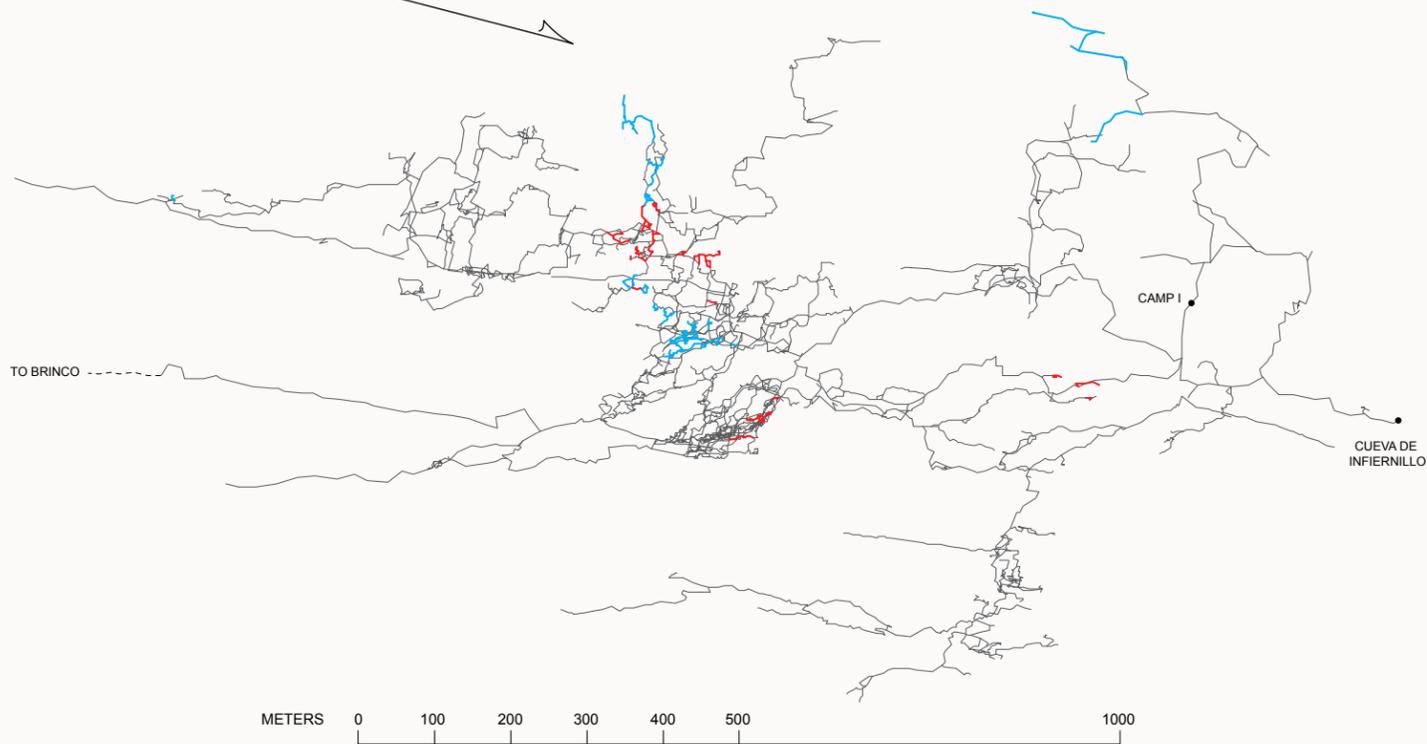
SISTEMA PURIFICACIÓN TAMAULIPAS, MÉXICO

LENGTH: 98,691m DEPTH: 953m
PROYECTO ESPELEOLÓGICO PURIFICACIÓN 1973-2022

CAMP I DECEMBER 2021 SURVEY SHOWN RED
CAMP I MARCH 2022 SURVEY SHOWN BLUE
DRAWN BY DAN GREEN 2022



PLAN VIEW ROTATED : 255 DEGREES



This was our last night at Camp I, so dinner was more creative and excessive than ever. There was broccoli cheese soup with chile de arbol, and so many other combinations. Cruz, for some reason or another, had developed a tremendous appetite, so that was really helpful for finishing off the last of the cheese and other heavy staples, lightening the load for the hike out.

On December 28, it was time to pack up camp. We made our way out to the beautiful entrance. How fun it was to see the sun after a week underground! We worked together to send all of the bags and all of the humans down our ropes, and took in the beauty of the mossy rocks and limestone walls on our hike out. On the drive back up to Conrado Castillo we took a welcome bath in the stream at Galindo. A big fire and even bigger stories from the other groups awaited us at the fieldhouse. A lovely way to spend Christmas with friends.

Abigail setting stations in the Tubes.
BARBARA LUKE



The Camp 1 team, L-R: Abigail, Chelsea, Ben, Victoria, Peter, Barbara, Cruz, Isabel.
CAIT McCANN



Isa mapping in the Eastern Confusion Tubes.
BARBARA LUKE



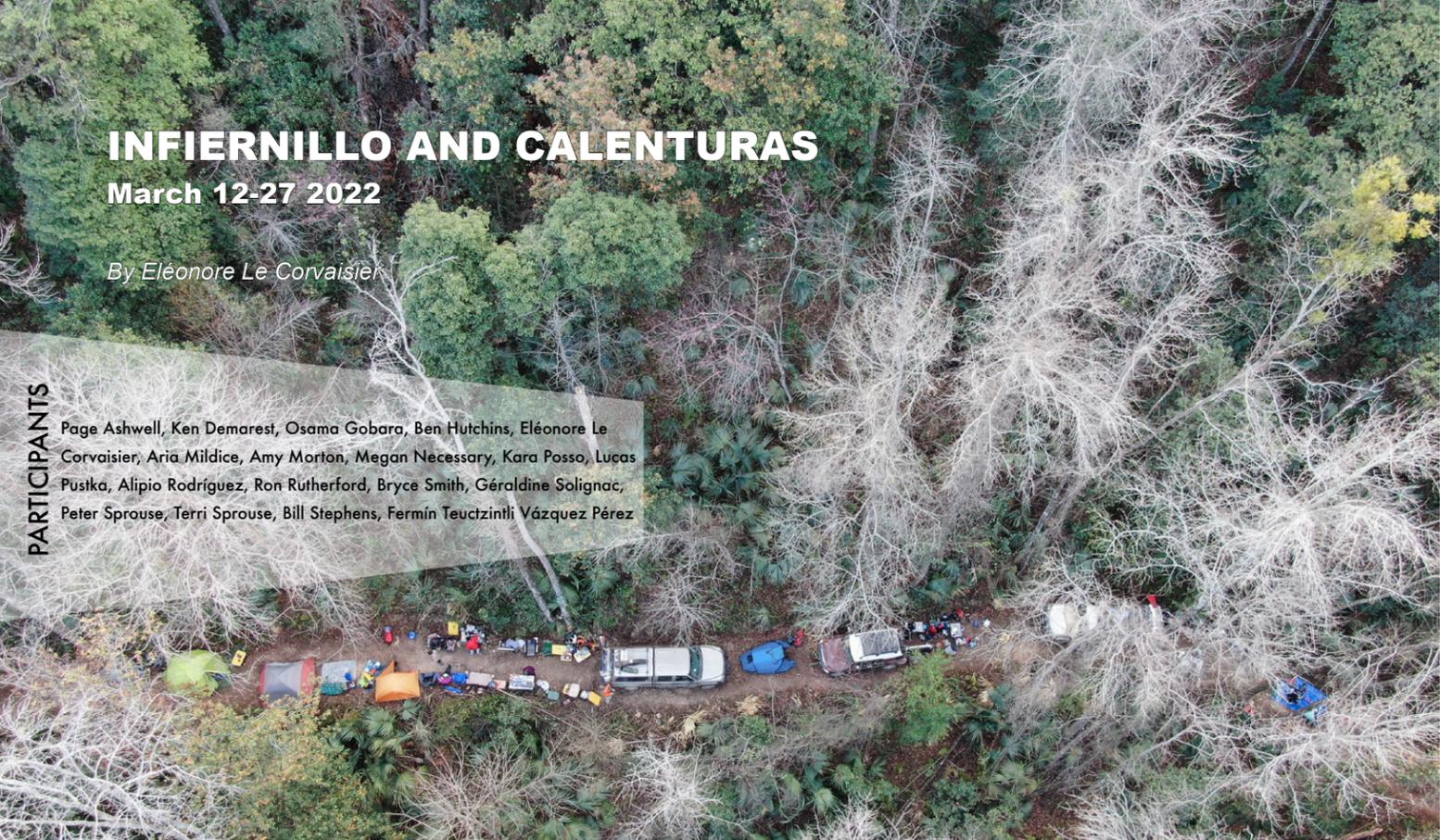
INFIERNILLO AND CALENTURAS

March 12-27 2022

By Eléonore Le Corvaisier

PARTICIPANTS

Page Ashwell, Ken Demarest, Osama Gobara, Ben Hutchins, Eléonore Le Corvaisier, Aria Mildice, Amy Morton, Megan Necessary, Kara Posso, Lucas Pustka, Alipio Rodríguez, Ron Rutherford, Bryce Smith, Géraldine Solignac, Peter Sprouse, Terri Sprouse, Bill Stephens, Fermín Teuczintli Vázquez Pérez



Drone view of Ramp Camp where the hike to Infiernillo started. BRYCE SMITH

THREE TRUCKS DEPARTED from Austin around 6 am the morning of March 12th: El Burro driven by trip leader Peter Sprouse, El Jefe manned by Ron Rutherford, and Ken Demarest's Special K.

We had an uneventful drive from Austin to Monterrey, despite a somewhat painful four hour border crossing. Conversation in Special K revolved around the future AI-driven revolution and subsequent apocalypse, previous caving expeditions, and Page's seemingly inextinguishable need for ice cream.

Isabel Grajales was our gracious host that night in Monterrey. At her place we met up with two Mexican cavers who had flown in from Playa del Carmen: the lovely Fermín and Alipio. Ten minutes past lights out was enough to draw the curtain on a desultory soundscape: the night was full of thrashers and snorers, ranging from querulous bear to runaway freight train, prompting a couple of haggard souls to move their sleeping quarters outside.

At dawn, bleary-eyed but alive, we drove from Monterrey to Infiernillo. We had lunch at the small town of Barretal, where we picked up our divers, Osama and Géraldine, driving their trusted Uva. Then up the mountain we went, on roads that seemed determined to rob El Jefe of

its undercarriage. We drove as far as the logging road would allow us, and set up camp on the road itself at Camp la Linea or Ramp Camp.

While some prepared dinner, a recon team walked to the cave before dark and reported back that the walk to the arroyo was an easy 30 minutes down, and a hard 40 minutes up to the cave. It wasn't until the next day that we would test the route loaded with dive and group gear, and see for ourselves how much we agreed with that estimate.



arroyo was more enjoyable- as in stimulating- than the walk back to camp through the forest... See sketch above:

Over the course of two days we schlepped gear from camp to the cliff base, then up a trolley line to the mouth of the cave, then from there to Camp I, where the sump was located. Each of the eighteen participants

In The Legend of El Cid, the eponymous Reconquista knight leaves with 500 troops, and as word of their heroism spreads, arrives at Valencia 3000 men strong. We left Ramp Camp with eighteen able-bodied women and men and arrived at the cave with the exact same number, which made us feel just as triumphant. Not a contrarian by trade, I nonetheless found myself in the minority thinking that the walk up the

In The Legend of El Cid, the eponymous Reconquista knight leaves with 500 troops, and as word of their heroism spreads, arrives at Valencia 3000 men strong. We left Ramp Camp with eighteen able-bodied women and men and arrived at the cave with the exact same number, which made us feel just as triumphant.

did at least two to three trips per day up and down large boulders, many much taller than any of us.

We didn't know it then, but gear was not the only thing being passed around during these early days.

In the afternoon of March 15, we settled at Camp I a bit ahead of schedule and spent our first night in cave. It was this author's first cave camp and I was pleased to find it less cold and humid than expected. This sentiment was shared by other first-timers and people new to the cave.

Six teams were organized in the evening and promptly departed toward their respective objectives the following morning.

Team Sump (Osama and Géraldine) dived the sump to survey it past the last station that had been marked by Bill Stone's team many years prior. They did three dives and eventually found the end of the line in the Left Hand Sump, having entered into the Main Sump. One side passage apparently surfaced in the Black Lagoon in Moria. Then they found a lead heading west that continues. They laid an estimated 200 m of new line that day.

Team Bigger (Ron, Megan and Page) was tasked with enlarging passage down in Moria. It took them seven hours to find the lead, as the stations were hard to locate. They brought back mixed news as the airflow in the lead was good, but the ceiling was too unstable for an extensive enlargement operation.

Team Balcony (Peter, Terri, and Fermín) mapped off of 99X in the Balcony Borehole, focusing their mapping efforts on a couple of loops off

of the Octopus Tube. They found a lead that went, and this was christened the Teuczintli Tube. It kept going multiple ways, and they ended the day with 18 leads.

Team Crawls-a-lot (Kara Posso, Lucas Pustka, and Alipio Rodríguez) fanned out past the Balcony Traverse to survey two leads that Peter Sprouse had left in December, mapping two loops and identifying a third. Alipio reportedly gave a heart-wrenching rendition of Stand By Me while exploring the increasingly narrow leads.



Infiernillo Camp 1. PETER SPROUSE

I was part of the consolidated Team Exodus traveling alongside Ben, Amy, Bryce, Aria, and Bill. Our mission was to survey within the Western Confusion Tubes in Ithilien, past the Misty Borehole, past Cyndie's Dildo Loop, through the Snackopotamus, beyond the Mud Jelly and other Mud Puppies before splitting out at the Tachyon Tunnel to continue mapping an extension of the cave that was rumored to be free-climbable. This was a sporting journey in beautiful, highly varied topography, most of which I had never encountered before. My favorite part was a tall narrow canyon that we had to go through on our knees, heads bent against the ceiling, using high chert shelves

running along each side to move forward. However, after six and a half hours of travel, without the Tachyon Tunnel in sight, this author had to admit to herself that she had clambered up, traversed, stemmed and frogged up all she could without compromising the trip back to camp. I communicated this to one of my team who asked if I had 60, 50 or 40% energy left. I can now admit I shamefully lied and said I was at 40 when I really was feeling 38%.

This is as good a time as any to emphasize the importance of communication in such situations. Once I let them know, my team was incredibly supportive. They spent some time discussing where they thought the elusive lead might be. Conveniently enough, the low resolution line plot map and sometimes cryptic notes had us thoroughly confused about where to connect into the lead passage, allowing me some time to rest. We travelled back to camp in about three hours. I will always be grateful for the grace they gave me on that return trip.

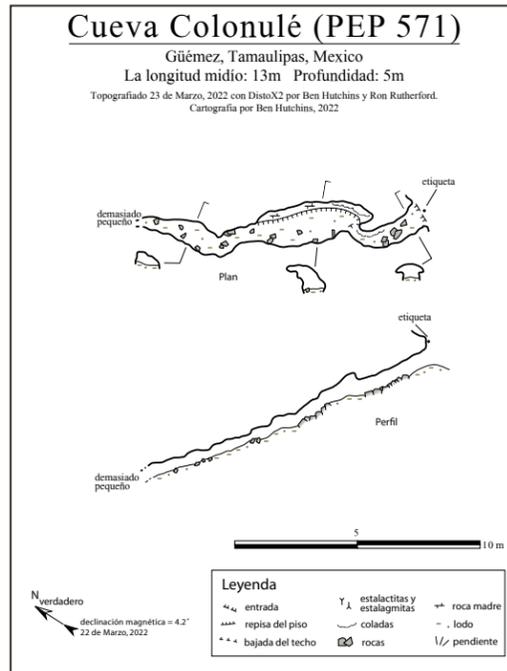
Back at camp around the kitchen rock, more poring over the map ensued. In the end, Aria made the most convincing case for where to find the lead the next day. That evening, hacking and sniffing joined the night chorus, and it became clear that a virus had infiltrated our ranks.

March 17 saw Ken return to active duty after a day's rest following his stint hauling packs up the trolley line. He departed with Peter, and they mapped two leads at the end of the Teuctzintli Tube. One went to Emerald Lake, which blew air but required getting wet to continue exploration. The other lead went well, and they tied into the Minus 5 Tube.

Page, Ron and Bill went to rig a 5 m drop at station 7WD. Unfortunately, that lead did not pan out. It dropped into the Fubar Tube, without them realizing it. There, they inadvertently remapped ten shots before finding a station. Kara's team, who had been mapping a loop off of the Octopus Tube, then joined Ron's team down the pit. They also mistakenly remapped a known passage, and a bit of new passage as well.

This time, Aria, Amy and Bryce successfully navigated to the Niño Enfermo lead without having to pinball around the Confusion Tubes, and although the lead up was indeed free-climbable, the wet slick walls made it dangerous to go too far up without equipment. Given how deep in the cave they were, should anything have gone wrong, it would have been a very taxing rescue indeed. Instead they surveyed the down lead for a ways. Here is how Bryce described the situation at the end of Niño Enfermo:

"There was a gentle breeze emanating from the farthest pit. The pit was coated



with a clay mud, it was unclear how the rock would be underneath. There were no natural tie-offs above the pit, so long bolts would be needed. The pit depth is estimated at 10-12 m. The pit on the approach to station 134XN is rigged with yellow webbing, should be re-rigged with rope. The squeeze before 134XN is 9-10 inches wide and 16-18 inches tall, at a 45 degree angle. Climb immediately before 134XN is covered with small popcorn and has only two handholds, it should be rigged with a rope too. The two climbs above 134XN both need aid gear. These high leads are the source of water for the wet passage beneath. The next push crew should be relatively thin and strong, and carry a lot of rope.

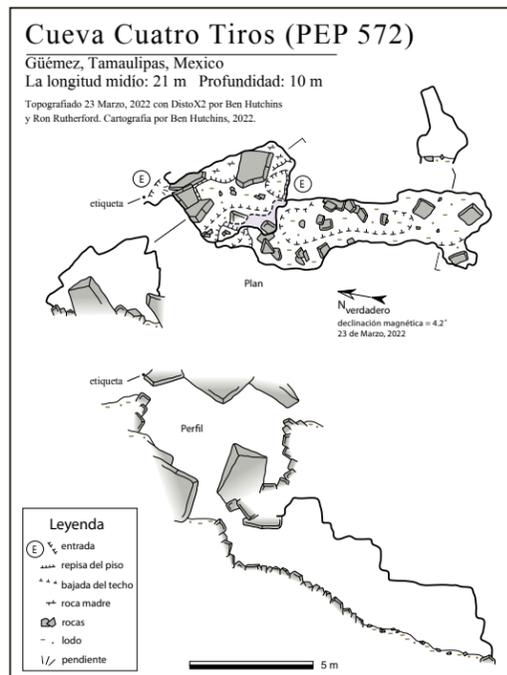
As for Ben, he took Megan and Lucas surveying past the Misty Borehole into a series of twisting scalloped canyons and mapped several loops in the Double D survey, including a tie-in into the French Hens, until they reached a 9 m drop above

a pool of unknown depth. Terri and I stayed at camp that day. Some of that time I spent helping the dive team gear up while vigorously chewing on Pepto Bismol tablets to stave off the ill effects of Microdyne.

March 18 was our third and last exploration day, and I went with Ben and Lucas to try and survey beyond the pool they had found. After an awkward descent down the snaking tube, Ben found that it was only about 1 m deep at its center, and shallower at one end, which allowed for relatively dry passage beyond it. Our survey picked up where Philip Rykwalder and his team had left off in 2006. We re-marked the tie-in station and proceeded down the tube that stood

around 1.5 m high and wide, with some stretches that didn't require any stoop walking. The passage, mostly small breakdown on the ground and scalloped walls, was entirely covered in a 2 cm layer of fudge-like mud, all indications that it gets flooded regularly. Although we saw few to no nutrients, we encountered a large, delicate, yet fast white harvestman gallantly strolling about. We admired it long enough to lull him into a sense of false security.

After two hours of surveying down the tube we came to a roughly 2 x 3 m wide pit that let us see another humanly passable tube 2.5 m below, where the pit ended. Sadly, we had no rigging equipment left, and the absence of competent substrate to anchor a rope prevented further



Drone view of the March 2022 team inside the Infiernillo entrance.
 BRYCE SMITH

exploration. The pit's far wall, directly opposite where we stood, appeared to be one black shiny block and had us theorize about the nature of the fracture we had just encountered. Looking up, we could see the fault pinching 3 m above. There was much longing and gnashing of teeth, but in the end we had to turn back to survey the side leads we had gone past on the way in.

As often happens, the cave did not let us leave without a reward. The last lead we surveyed ended at a graceful, 2.5 m high dome room with a perfectly round, translucent pool at its center and a small chimney above it. As far as we could tell from the ground, it was not humanly passable.

Back at camp, we heard that Peter and Ken, and Amy and Ron had mapped loops off of the Octopus, the Silly Wabbit, Effexor, and Fubar Tubes. Aria and Page dropped the pit at 85XB and found a promising lead but were stopped because further exploration would require getting wet.

Kara, Bryce, and Alipio on the other hand mapped off the Party Never

Ends, and connected to the Energizer Bunny, including the Optimistic Octopus and Pasaje Nunca Jamás, named by Alipio who pushed it at the expense of his sanity. As for the dive team, they finished everything up to the dry section, including sketching, but equipment issues prevented them from going any farther. Our survey efforts above and below water had yielded 1551 m, resulting in a new length of 98,961 m for Sistema Purificación.

We all got up early the morning of March 19th and against all odds managed to get all the gear out of the cave, pack up Ramp Camp and drive to Conrado Castillo that same day. We wore our masks on the car ride in an attempt to slow down contagion, with little results. We reached the fieldhouse around midnight and despite the strong wind shaking our tents had no trouble going to sleep.

On March 20th we awoke to clear skies and a light breeze, enough to keep us cool and comfortable. Fermín and Alipio got an early start, seizing this chance to walk up and down the mountain, looking for rare endemic plants, some of which were already in bloom. Like people of yore, we spent the day tending to our essential needs: walking through



Drone view of El Hundido.
BRYCE SMITH

the forest to get drinking water from a spring, washing our clothes, bathing, getting survey data to our chief.

In the morning, time marched to the rhythm of the shirts, socks and pants laid out to dry on the perimeter fence. By noon, the fence was entirely covered in dripping clothes, including it turned out, a pair of rogue socks who had simply taken this as an opportunity to socialize.

As the bustling of activities abated, we gathered around a fire and traded stories while passing a bag of fresh, crisp apples. Behind us, the fieldhouse was our afternoon sundial, tracing the course of the star as it dipped down into the forest. Originally a simple village house, it was transformed and improved by several generations of visiting cavers, most notably by the illustrious Gill Ediger. It is still a very handsome building, surrounded by open pines and boasting many caver-friendly adaptations. We added our names and the date of our visit to the inner walls, or the ceiling, if you were Bryce. Our most delicious dinner was had there, an improvised “Mexican curry” prepared by Amy and Ron using supplies pooled together from all four trucks. Well, not quite, since Uva’s occupants were living in greatly reduced conditions, having to survive on cake mix and beer only. Meanwhile, the virus was hard at work, spreading faster than the shadow of Mordor.

It was with a somewhat heavy heart that we left the next day, having befriended one of the local dogs, a gaunt little brown thing we (re)baptized Pollo. If Ron’s truck, El Jefe, survived the next leg of our journey he owes it to the diligence of the roadcrew and the combined sympathy of Ken’s truck, directly following him. For many hours, his differential was “only one hit away” from giving up the ghost and had us wringing our hands in prayers. Finally, unable to sustain the sight of El Jefe’s

ascent to Golgotha any longer, I hopped on El Burro’s back with Bryce and paid for the ride by doing meaningful roadcrew work.

We got to our next camp near Sótano de Las Calenturas, eight kilometers away from the fieldhouse, in a mere five hours. Donk’s Camp (there was ample evidence that donkeys frequented the place) was established in a picturesque corner of the pine forest defended by enormous boulders whose nooks and crannies were home to a myriad of delicate ferns and bromeliads. To our collective relief, it was located a glorious four minutes walk from the cave’s main entrance, which made schlepping much easier. Peter, Ron, Page, and Ken stayed up late to secure the cave entrance and double rig the pit, and that evening, they were particularly grateful to get to sleep on a soft bed of fragrant pine needles.

The morning of March 22nd we valiantly marched to the cave, leaving Amy, Bill, Terri, and Page behind, as they were the most badly sick then. The descent into Calenturas was a bit more laborious for me. I was not used to such a long steep approach on rope before getting to the actual pit, this being only my seventh time on rope in a cave. The slope to the pit was such that you could not put eyes on the actual free hanging rope until you were right there, perched with your butt hanging above it. Once I was finally attached to that last rope, my stomach relaxed and I went down, much relieved that the balancing act was over. Inside, I used reverse psychology on the cave by loudly betting with Lucas that schlepping in Calenturas would be way worse than in Infiernillo. Not to brag but, it worked. Although we had to get on rope a handful of times to reach the sump, it was mostly rappelling and with only Osama diving this time, one trip was enough to shuttle all the gear. Blessedly, Calenturas was also a couple degrees cooler than Infiernillo, and there was much more level passage within. It didn’t hurt that the

cave was beautiful, all smoothness, colors, and swirls. While waiting for the rigging team to work on the last canyon, Aria and I made a game of finding stations in the Thanksgiving Thruway. Each rock had its own character and evocative shape, and we capered up and around them like cave sprites.

Finally we got to a wide sump and left our gear in a deep pothole doubling as a viewing balcony. The purpose there was to try and connect Calenturas to Sistema del Río Corona. A couple of sumps had been discussed as good candidates. Osama and Géraldine had looked at both and it was decided to give Turkey Sump priority. Osama seemed a bit skeptical at first glance, given how shallow the visible part of the sump was, but he did not want to dash anyone’s hopes. His reservations disappeared quickly. On his first dive the next day, he found an 8x4 m passage... and ran out of dive line!

While he was exploring the sump, a small support team (Amy, Alipio, and Megan) waited by the water. The rest of us went either karst walking or pit bouncing at the enormous El Hundido pit. This was deemed preferable to surveying in cave since we had reached a critical mass of sick people and felt it might not be wise to spend more time in close quarters with little air circulation. While some of the team bounced El Hundido, Peter and Ken went ridgewalking high up to the west of the huge pit, which could be seen down below. Ben and Ron did a lot of ridgewalking nearby in the meadow El Chihue, finding two new caves to map. These were Cueva Colonule and Cueva Cuatro Toros.

The very next day, Osama was able to make the connection to Río Corona, with only another 20 m of line needed before he found station CN432 etched thirty years prior. This prompted the renaming of Calenturas and Río Corona into “Sistema Corona”, 11,529 m long.

That evening, we hauled the dive gear back to camp with the satisfaction of having accomplished a major objective. We celebrated around the campfire and Osama gave a characteristically unassuming interview to Bryce about the honking passage he had found.

This allowed us to leave one day sooner than expected. On the morning of the 25th we packed up camp and drove toward the village of Los

San Pedros. We stopped briefly to admire the entrance pit to Cueva del Tecolote, adorned with a vibrant statue of the Virgin Mary, before heading to the Río San Pedro for a bath. After many dusty hours and a lunch stop at Barretal, the road deposited us in front of Isabel’s where we spent our last night in Mexico.



Speocirolana endeca.
PETER SPROUSE

By the end of the trip, only four out of eighteen people had remained in good health: Aria, Lucas, Megan, and me. Osama and Géraldine held on for a long while but reported symptoms at the very end. By far the greenest caver on the crew, this trip was incredibly formative for me, and I would recommend anyone a bit on the fence about Mexico expeditions join one. Chances are, you’ll get hooked.

Lessons learned: While loading Special K and talking to the others, I found I packed too small. Thankfully, it was possible to get more clothes at a local supermarket before heading out to the caves.

While schlepping at Infiernillo, I found my body’s limits, and pushed past them, like everybody else, albeit not as elegantly. I will be sure to do some leg workouts before my next expeditions.

While traveling through the caves, I encountered some exposed spots that unsettled me so much that I had to take some time to get my wits about me. But I deliberately went back to confront those obstacles again, and negotiated them better. I take it as proof that it is possible to join such an expedition, even if you’re not terribly comfortable around heights.

While cave camping, I learned that you should absolutely not stop taking



Géraldine Solignac and Ken Demaest leave a clean campsite.
PETER SPROUSE

Pepto Bismol just because you feel better one day.

By watching Alipio Rodríguez, I also learned that you can work past the language barrier and become a beloved and valued team member, as long as you have a positive attitude and the ability to create superb pine cone cairns.

As cavers, we talk a lot about the value of camaraderie and the thrill of exploration. At PEP this March, the two came together in an enthralling mix.

CALENTURAS TO RÍO CORONA CONNECTION DIVE

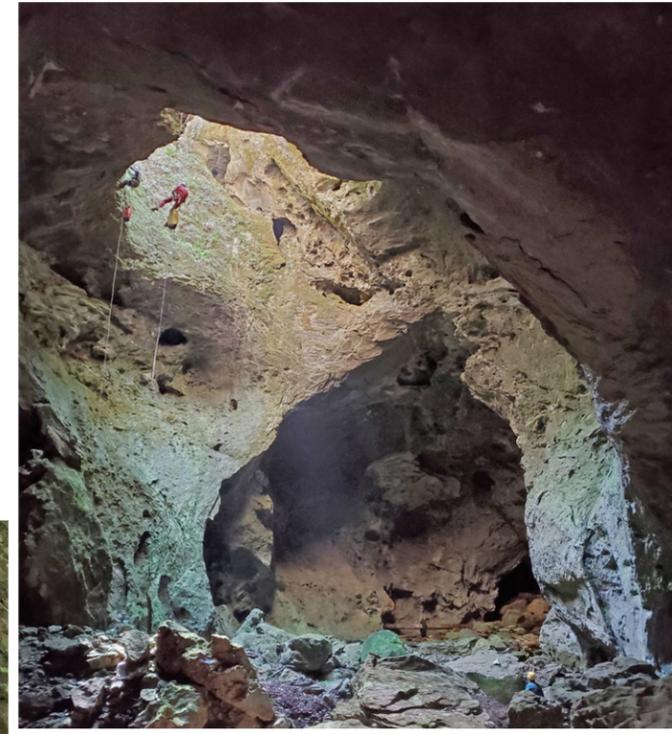
March 2022

By Osama Gobara

ONE OBJECTIVE OF the March 2022 PEP expedition was to find a possible connection between Sótano de Las Calenturas and Cueva del Río Corona, in the village of Yerbabuena. Following the Infiernillo camp and dive and a couple of days rest at the project fieldhouse in Conrado Castillo, the entire team moved camp to the village of Yerbabuena. Both Calenturas and the resurgence cave of Río Corona, the headwaters of the river of the same name, had terminated in big sumps about 500 m apart. They had remained unexplored, and Peter was quite certain they would connect. The whole team made a sterling effort to carry dive equipment to the downstream Calenturas sump, which required a series of vertical pits and a final rope descent into a large and deep sump pool.

The next day we descended into the pool and quickly found a wide passage going north at a shallow depth. On this dive, approximately 500 m of phreatic passage was explored and surveyed before running out of dive line. The survey data showed that the passage was indeed very close to Río Corona at the north end.

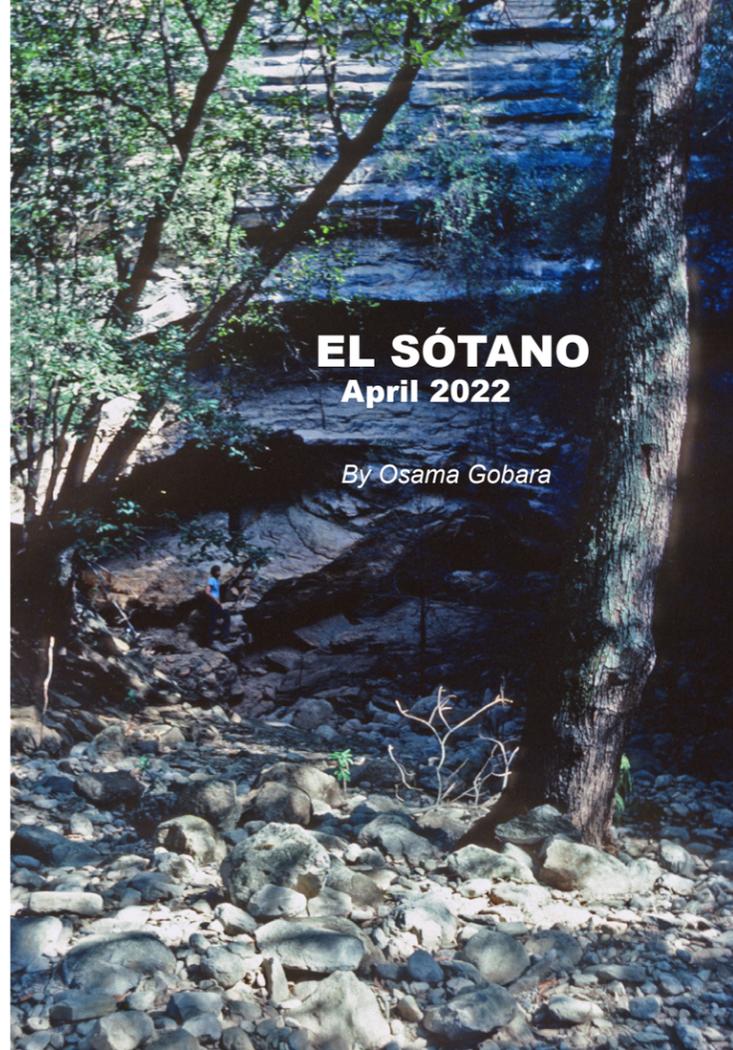
The following day I returned with full reels together with Géraldine as support, hoping for a possible connection. After an additional 80 m the dive passage ended in a deep sump pool, and looking at the sketch I quickly realized that this was indeed the upstream Río Corona sump pool. My smile was big when I finally found an old survey station with the numbers 432 still clearly engraved on the rock. This station was specially marked for future divers during the original exploration in the 1990s, and had survived the last 30 years in a very active wet river cave. On the way out I sketched and surveyed the newly discovered passage, feeling happy that we could contribute to finally connecting these two caves. The resulting Sistema Corona is 11,529 m long.



PETER SPROUSE

Eléonore rappelling dive gear into the Calenturas entrance.
PETER SPROUSE





EL SÓTANO

April 2022

By Osama Gobara

Jim Feely at El Sotano, 1982.
PETER SPROUSE

SOME TIME AGO Peter Sprouse had mentioned a dive lead in El Sótano. El Sótano is a vertical cave located in a dry riverbed close to El Carrizo in the municipio of Jaumave. Although it is a rather small and unassuming cave, there is great potential that El Sotano may be the resurgence for Cueva del Tecolote, which is 40.4 km long. The initial dry section had been mapped down a steeply sloping passage to a sump in 1982. Recognizing the potential, Geraldine and I flew to Monterrey in August 2021 in order to take a reconnaissance trip to El Carrizo and check the diving potential of the sump. We met up with biologist Arnulfo Moreno in Ciudad Victoria, who kindly agreed to come with us and assist in any logistical matters. El Carrizo is a small village, and we quickly found the head of the ejido, Don Abundio. He promptly granted us access to the cave, and sent his grandson Bryan with us to guide us to the entrance. El Sótano is approximately 60 m deep, requiring rope to get down the sloping passage to the sump. In August the sump looked fairly promising with clear water, approximately 10 m in diameter.

In April 2022 during a dive trip to San Luis Potosí and Tamaulipas we dedicated two diving days to checking the sump. Together with two friends from Quintana Roo, Mauro Bordignon and Sabine Sidi Ali, we arrived in El Carrizo late one afternoon and quickly found Don Abundio, who promptly escorted us to the cave, which we started rigging for lowering dive equipment the following day. This time of the year, the sump looked utterly uninviting, a green/yellow static pool with a foul stench of guano and cow poo. The water levels were approximately 10 m lower than in summer and the pool looked more like a small puddle with not much potential. Yuck, the joys of cave exploration...



OSAMA GOBARA



Mauro laying line into the sump.
OSAMA GOBARA



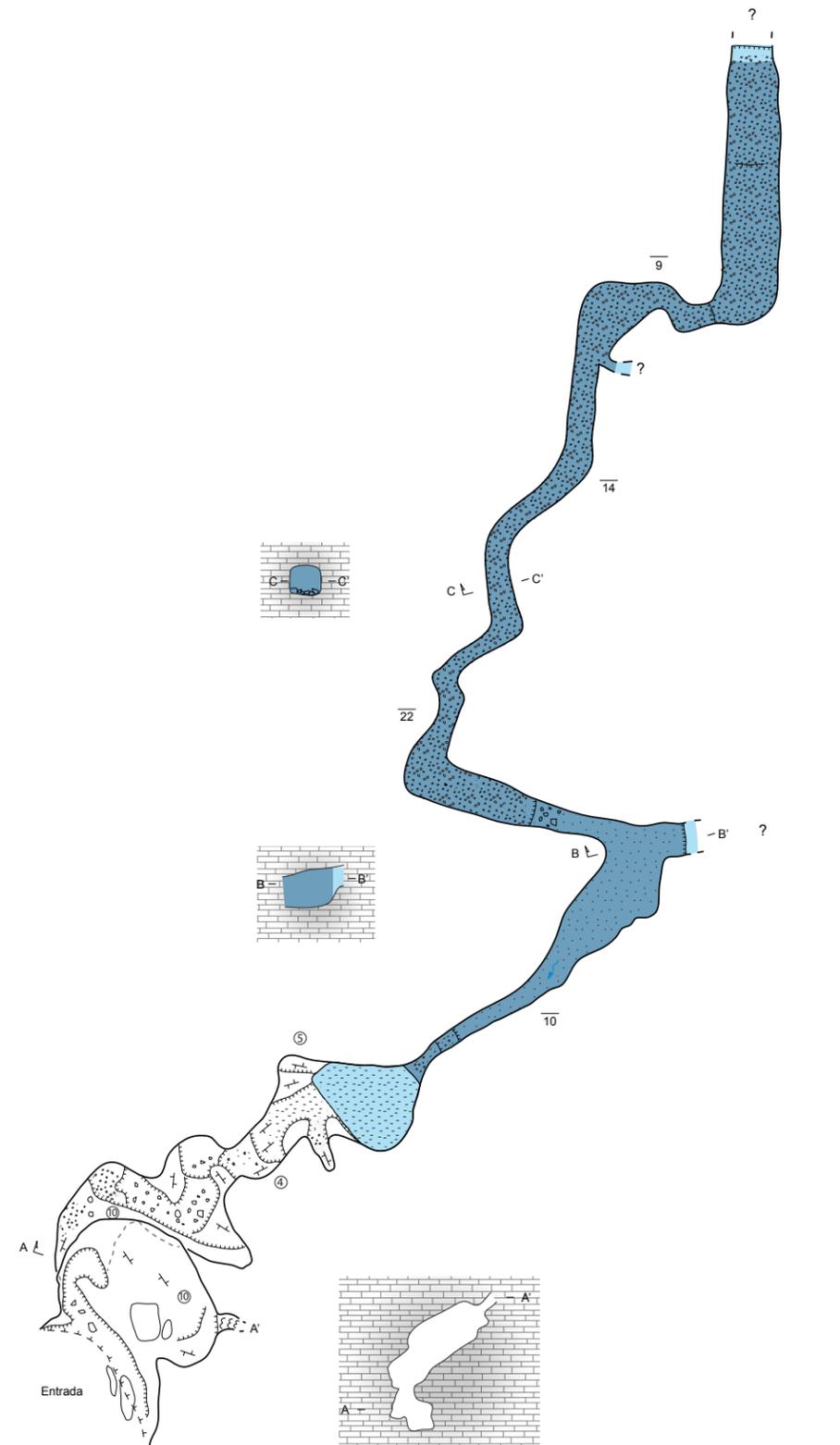
The slope down to the sump.
OSAMA GOBARA

None of us were really keen on diving this foul sump, but we had come all this way and rather democratically decided that Mauro had picked the shortest straw and was left to check the sump the next day. We camped in the local village hall overnight and had a splendid evening sharing stories over beers with Don Abundio and his daughter Silvia Verdines.

The next day we transported all diving equipment with the valued help of two mules and a donkey, and we quickly lowered all our equipment to the sump. Starting in zero visibility, the pool narrowed to an unstable boulder choke that was eventually passed by touch contact, feeling the way forward. Beyond the choke the passage opened up and descended to 13 m depth. The visibility got a lot better and the passage continued in a northeast direction. Eventually the passage split and an unstable gravel passage continued to the water surface. The main passage continued northwest, descending to 23 m water depth, after which it turned north and steadily got shallower until it surfaced in on-going muddy dry passage after about 200 m. Exiting the water was not feasible on this dive due to the low levels, and a return journey will have to be done when water in the sump is higher. On the way out the whole cave was surveyed and sketched.

El Sótano

PEP118
El Carrizo, Jaumave, Tamaulipas



Legend

- | | |
|----------------|--------------------------------|
| Passage | Floor Drop |
| Lower Passage | Ceiling Drop |
| Boulder | Slope (lines diverge downhill) |
| Small Rocks | Flow Direction |
| Sediment Floor | Flowstone |
| Mud Floor | Cave Mud |
| Water | Sump |
| Ceiling Height | Depth of Line |
| Dry Lead | |



Topography 16 Dec 1982 & 19 Apr 2022
 Surveyed Length: 287 m,
 Elevation change: -70 m
 Max Depth Sump: -22.5 m

Survey & Sketching

Terri Treacy Sabine Sidi-Ali
 Peter Sprouse Mauro Bordignon
 Jim Feely Osama Gobara

Drafted by Osama Gobara May 2022



PURIFICACIÓN SPELEOMETRY

September 2022

Long Caves (m)

1.	Sistema Purificación	98,961
2.	Cueva del Tecolote	40,475
3.	Sistema Corona	11,529
4.	Sistema Cretácico	6065
5.	Cueva de La Llorona	4091
6.	Sótano de la Cuchilla	2784
7.	Cueva Paraíso Difícil	1799
8.	Cueva Vista Maxima	1673
9.	Sistema Manicomio Paralelo de Satanas	1639
10.	Sistema Los Toros	1633

Deep Caves (m)

1.	Sistema Purificación	953
2.	Sistema Los Toros	576
3.	Sistema Cretácico	465
4.	Cueva del Tecolote	419
5.	Cueva de La Llorona	412
6.	Sima Chupacable	399
7.	Sistema Manicomio Paralelo de Satanas	326
8.	Sótano del Caracol	301
9.	Sumidero Anaconda	278
10.	Sótano de la Cuchilla	208

View of El Hundido looking East.
BRYCE SMITH



Purificación Area Cave Descriptions

Contributions by Jerry Atkinson, Ben Hutchins, Bev L. Shade, Peter Sprouse, and George Veni.
Coordinate systems vary

Cueva X

Conrado Castillo, Tamaulipas
Length: 183 meters Depth: 31 meters
Coordinates: 451614, 2650228 NAD27 UTM

Cueva X is located on the north edge of Conrado Castillo. This cave was mapped on 28 March 1978 by Sheila Balsdon, Andy Grubbs, Peter Sprouse, and Terri Treacy. A short climb down leads immediately to a crawlway that splits in a Y, one branch headed west, the other northwest. The western passage is about 120 m long, and zig zags down about 30 m. Survey ended as a small gravel-floored passage. Sheila dug on this awhile. When the cave was mapped, this passage was blowing. The northwest passage is about 60 m long, ending in several narrow fissures. The troglobitic scorpion *Troglocormus willis* was first collected in this cave. (BLS, PS)

Cueva de Coral

Conrado Castillo, Tamaulipas
Length: about 50 meters Depth: not recorded
Coordinates: No coordinates recorded, general location indicated on location sketch map

This cave was discovered 19 March 1979 by Jerry Atkinson, Dale Pate, and Mark Shumate. They returned the following day to make a sketch. It was not mapped, and is located near the top of Cerro Zapatero on the east side of the crest. According to the notes, the cave is an "old phreatic passage, predating present topography." They note secondary fill up to 2 m above the current

PEP9

floor level, as well as abundant dessicated flowstone and cave coral. (BLS)

Cueva de Desmontes

Conrado Castillo, Tamaulipas
Length: 235 meters Depth: 29 meters
Coordinates: 23.9586615, -99.4744038 NAD83 lat/long

A walk in entrance leads to a single large chamber with a skylight on the west side of the passage. The cave ends in a tight pinch. Sheila Balsdon and Terri Treacy began the survey of this cave on 16 April 1978. Terri finished the survey along with Peter Keys and Mark Shumate on 15 April 1979. This cave comes within 25 m of connecting to Sistema Purificación, but repeated attempts to find a connection were unsuccessful. (BLS, PS)

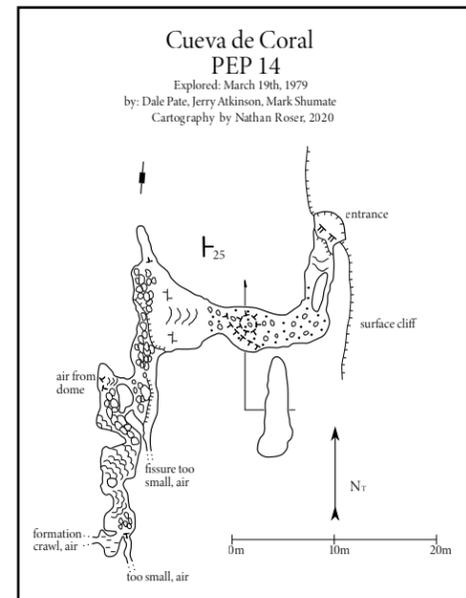
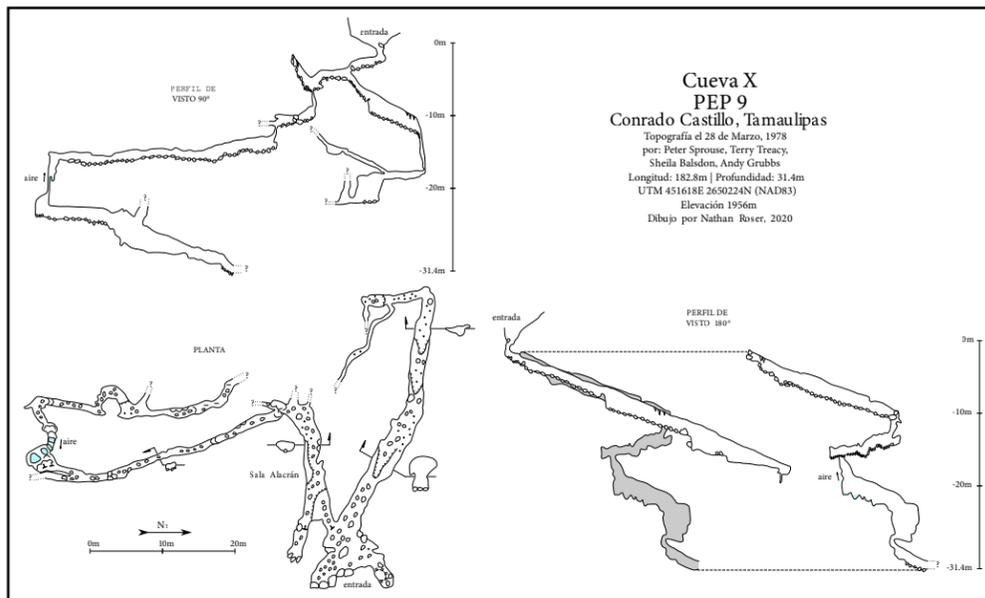
Cueva de los Sierpes

Conrado Castillo, Tamaulipas
Length: 214 meters Depth: 30 meters
Coordinates: 23.9557315, -99.4736537 NAD83 lat/long

This cave has a large walk-in entrance that leads to a large, well decorated chamber. Smaller passages lead both northwest and southeast from this chamber. They both extend about 40 m horizontally, pinching out in numerous small fissures. The southeast passage has a pit in the floor that drops into a lower level that extends about 30 m, dropping to a depth of 30 m. Mapping started on 15 April 1979 by Steve Pitts and Peter Sprouse while Gill Ediger checked leads. Ediger found several

PEP18, 19

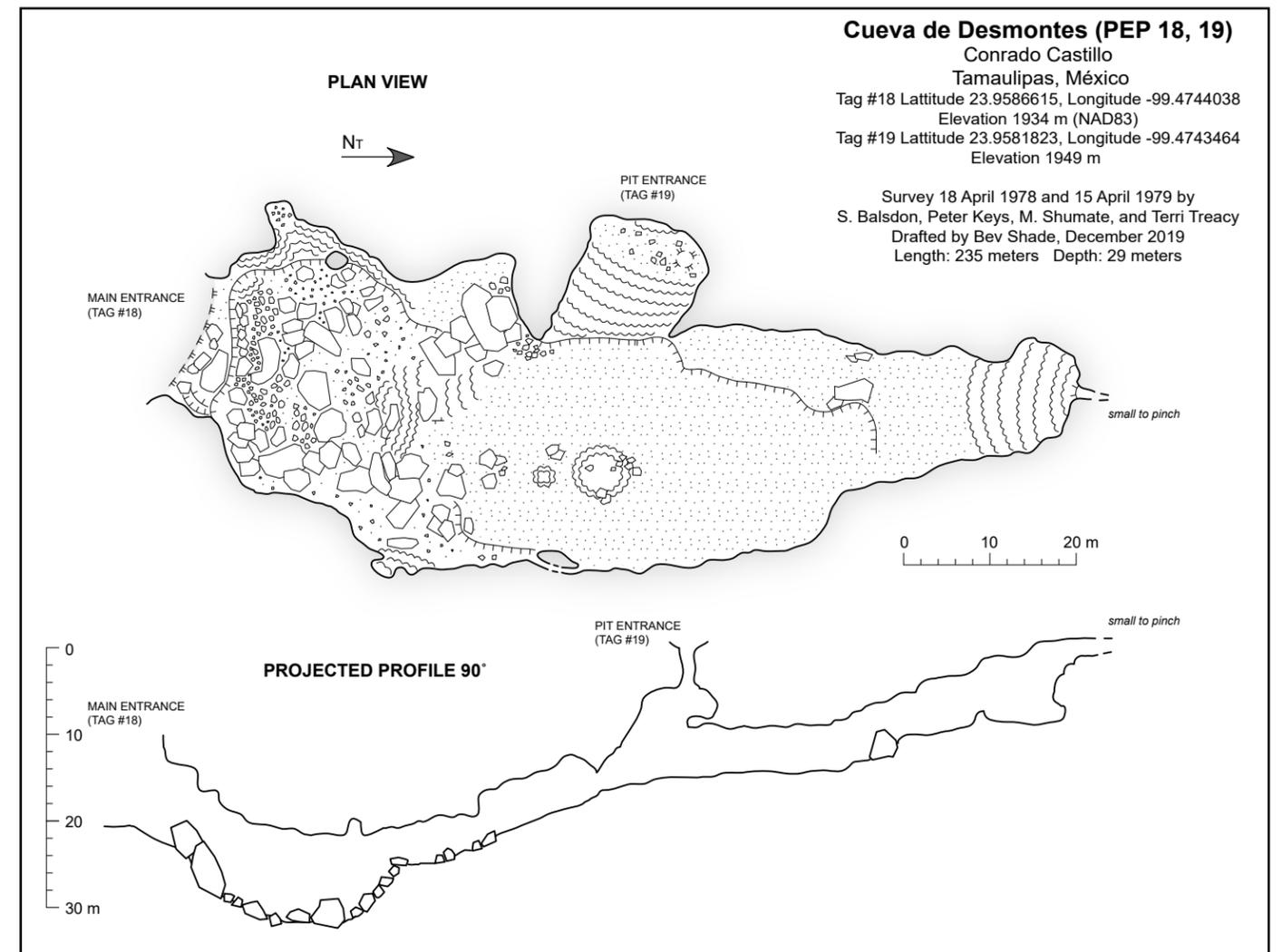
PEP21



leads with airflow, including one that he wanted to enlarge. On 17 December 1995, Marcus Barksdale, Barbara Luke, and Jack White returned to mop up leads, but a way on was not found (BLS, PS)



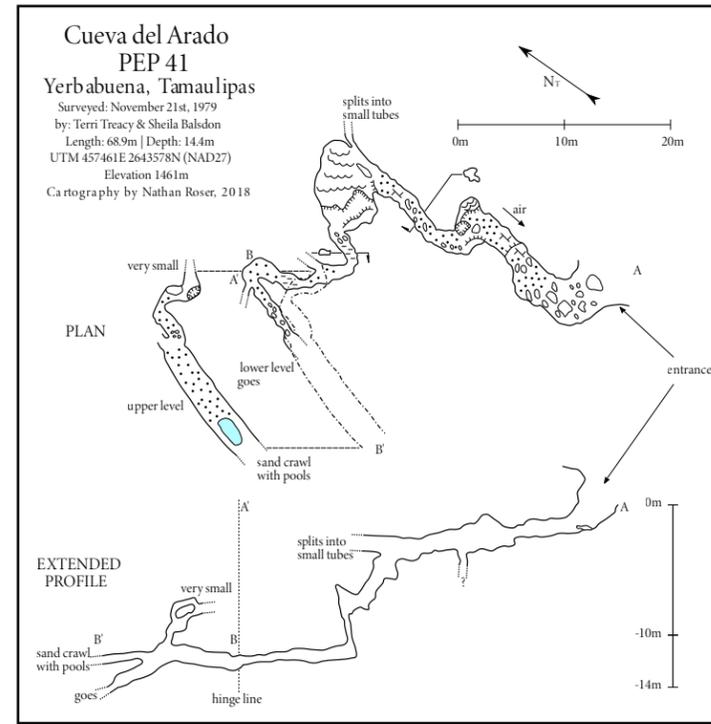
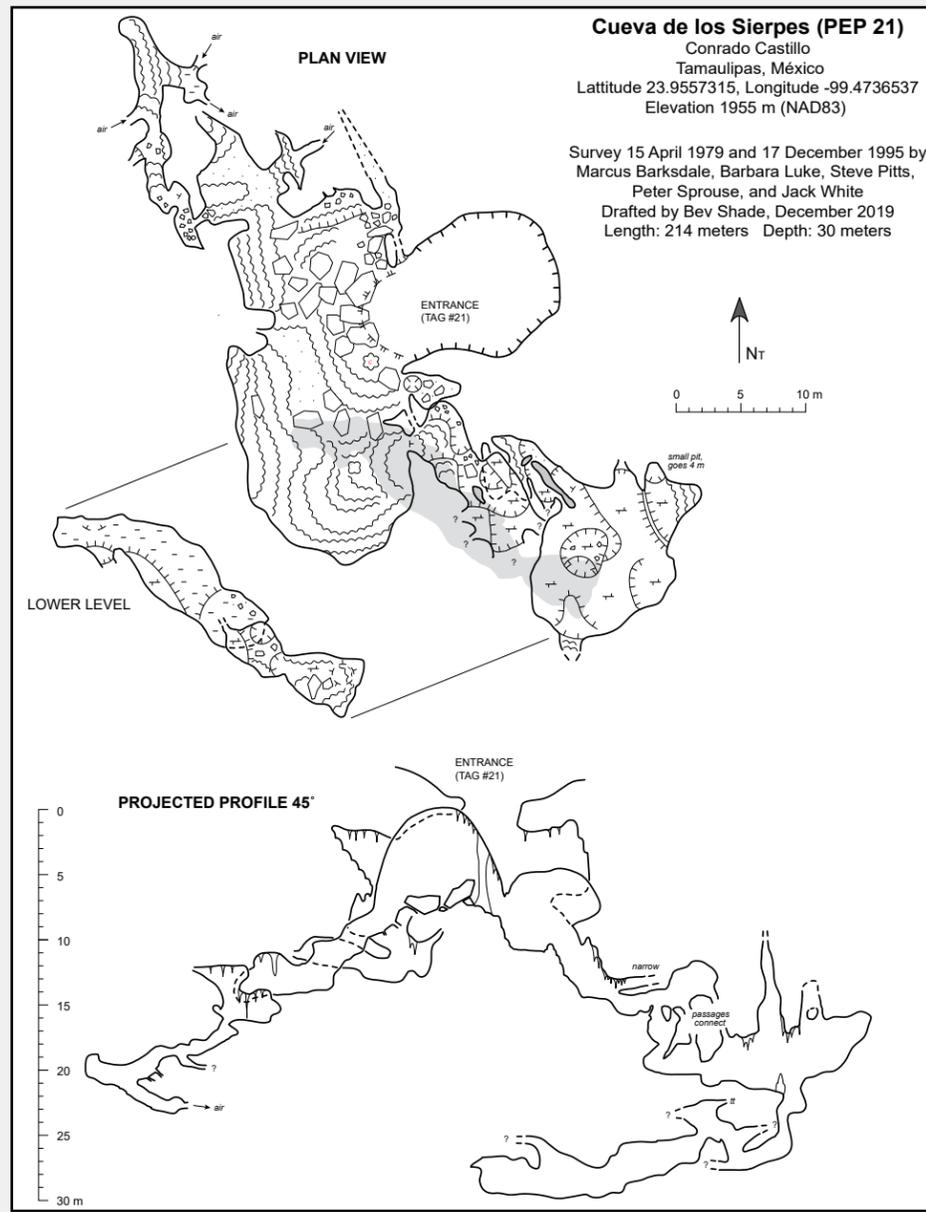
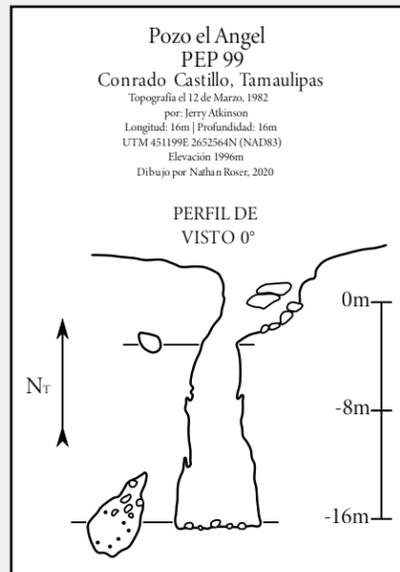
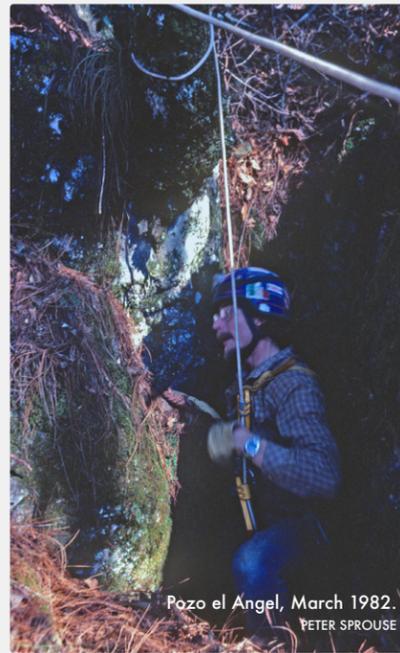
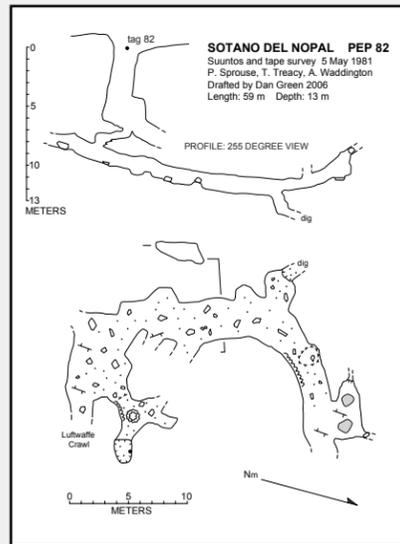
Cueva de Desmontes entrance chamber, 1985. PETER SPROUSE



Cueva de Desmontes (PEP 18, 19)

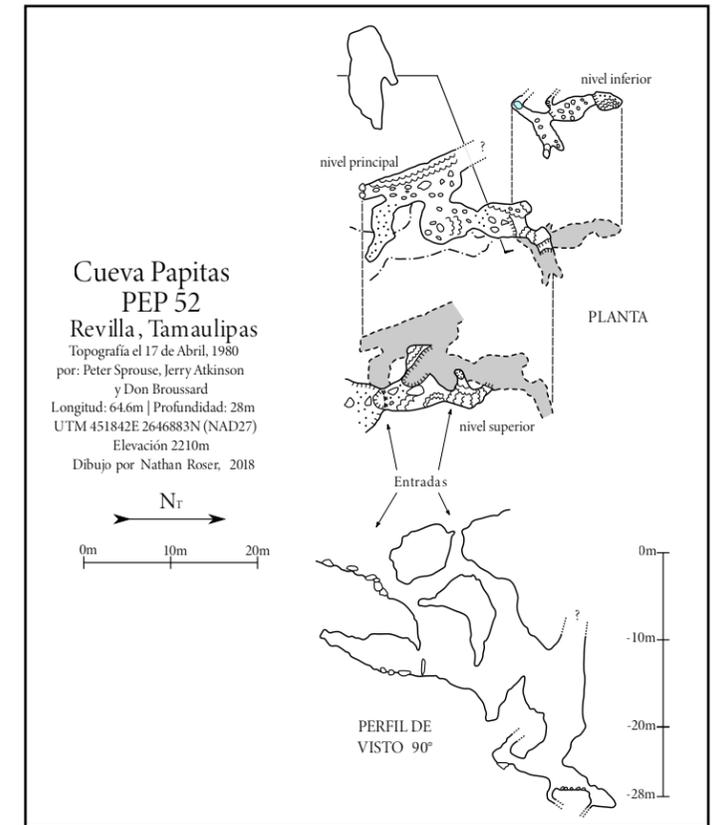
Conrado Castillo
Tamaulipas, México
Tag #18 Latitude 23.9586615, Longitude -99.4744038
Elevation 1934 m (NAD83)
Tag #19 Latitude 23.9581823, Longitude -99.4743464
Elevation 1949 m

Survey 18 April 1978 and 15 April 1979 by
S. Balsdon, Peter Keys, M. Shumate, and Terri Treacy
Drafted by Bev Shade, December 2019
Length: 235 meters Depth: 29 meters



Cueva del Arado PEP41
 Yerbabuena, Tamaulipas
 Length: 69 meters Depth: 14 meters
 Coordinates: 457428, 2643779 NAD27 UTM

This cave is located south of the village of Yerbabuena, and comes within 50 m of passage in Sótano de Las Calenturas. A 25 m long entrance crawl leads drops a few meters to another crawl about 20 m long. This passage continues as a sandy crawl with water, and also drops into a lower level that continues, although quite small. The day the cave was explored, it was blowing. It was mapped 21 November 1979 by Sheila Balsdon and Terri Treacy. (BLS, PS)



Cueva de Las Papitas PEP52
 Revilla, Tamaulipas
 Length: 65 meters Depth: 28 meters
 Coordinates: 451809, 2647084 NAD27 UTM

Two small climb down entrances lead to three levels of small passage that end in narrow fissures. The cave is located about 700 m SE of Revilla on the road going to Gavilan and Yerbabuena. David McKenzie may have explored the cave some years prior to it being surveyed 17 April 1980 by Jerry Atkinson, Don Broussard, and Peter Sprouse. (JA)

Cueva del Alacrán PEP58
 Conrado Castillo, Tamaulipas
 Length: 20 meters Depth: 1.3 meters
 Coordinates: 451394, 2651751 NAD27 UTM

This cave was mapped 3 June 1980 by Peter Sprouse and Terri Treacy. It is a small horizontal passage in the side of an arroyo, 20 m long. Exploration stopped as the passage got smaller and was flooded by water. (BLS)

Grieta de las Flores PEP70
 Conrado Castillo, Tamaulipas
 Length: 77 meters Depth: 55 meters
 Coordinates: 451073, 2649804 NAD27 UTM

This cave was mapped 29 December 1986 by Peter Bosted, Bill Farr, and Carol Vesely. A small entrance leads to a well-decorated 35 m pit where the team discovered a dog skeleton. A hole in the floor of this pit drops another 10 m to a lower level that leads about 20 m to the southeast. The cave ends in a tight streamway. (BLS)

Sótano del Nopal
 Conrado Castillo, Tamaulipas
 Length: 59 meters Depth: 13 meters
 Coordinates: 450325, 2651534 NAD27 UTM

This cave is located in the abandoned village of Los Caballos. A narrow 7-m-deep pit drops to about 30 m of horizontal crawls. Several going side leads were left. This cave was mapped 5 May 1981 by Peter Sprouse, Terri Treacy, and Andy Waddington. (BLS, PS)

Cueva de la Boca
 Conrado Castillo, Tamaulipas
 Length: 60 meters Depth: 13 meters
 Coordinates: 451649, 2650509 NAD27 UTM

This cave was mapped 6 April 1982 by Jerry Atkinson, Peter Sprouse, and Terri Treacy on an off-day, while also surveying nearby Cueva de la Onza and tying them both to an existing surface survey. Cueva de la Boca is located approximately 500 m north of Conrado Castillo below the road to Agua los Allarines. A small entrance drops into a northwest/southeast horizontal passage about 40 m long. A pit in the north end of the passage drops a few meters before splitting into several small tubes, one of which may be passable. (JA, BLS)

Pozo del Contrabando
 Conrado Castillo, Tamaulipas
 Length: 33 meters Depth: 30 meters
 Coordinates: 451993, 2653741 NAD27 UTM

This cave is located near the top of the Arroyo el Contrabando, which feed the Río Guayabas. It is a narrow 30 m pit, plugged at the bottom with dirt and rocks. The drop is nicely fluted, and drippy. It was mapped 20 April 1982 by Peter Sprouse and Terri Treacy. Fauna collected included terrestrial isopods, ground beetles, blue millipedes, and troglobitic harvestmen. (BLS, PS)

Cueva la Brujita
 La Llorona, Tamaulipas
 Length: 9 meters Depth: 4 meters
 Coordinates: 459640, 2642041 NAD27 UTM

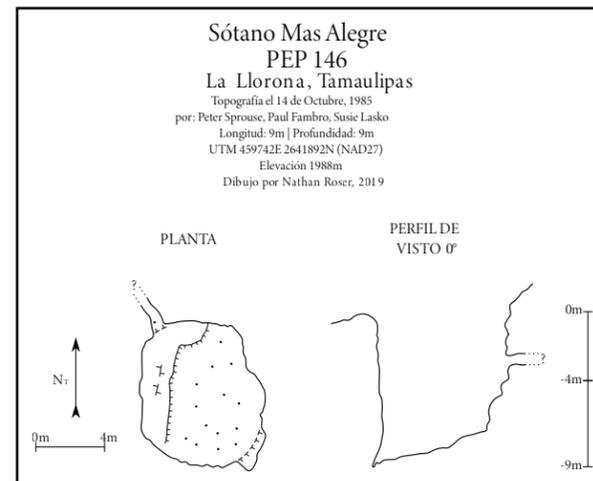
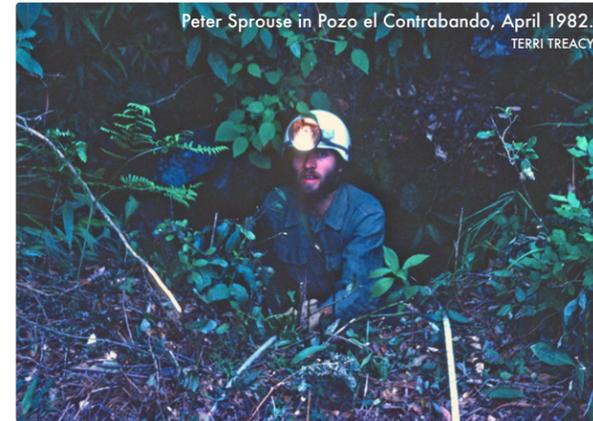
This cave was mapped 14 October 1985 by Paul Fambro, Pat Kambesis, and Peter Sprouse. It is a straight 10-m-long crawlway that trends southwest and dips about 20 degrees. Exploration stopped when the crawl split into two smaller passages. (BLS)

Sótano Mas Alegre
 La Llorona, Tamaulipas
 Length: 9 meters Depth: 9 meters
 Coordinates: 459709, 2642092 NAD27 UTM

This cave was mapped 14 October 1985 by Paul Fambro, Susie Lasko, and Peter Sprouse. It is a wide pit, 30 m deep, plugged at the bottom with dirt and rocks. (BLS)

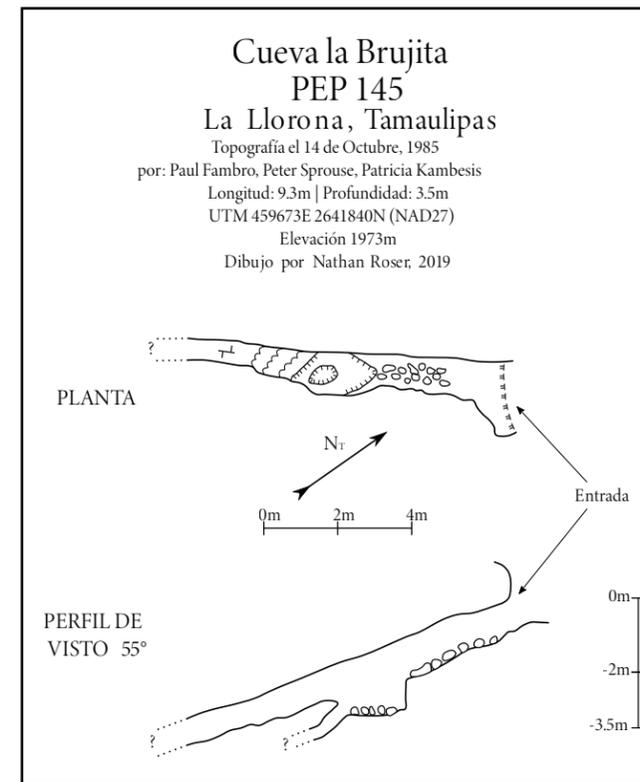
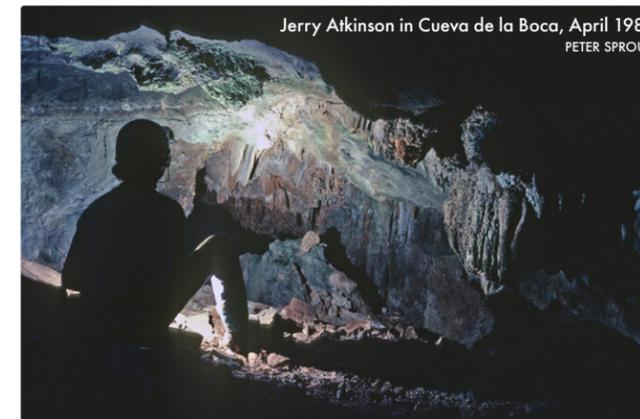
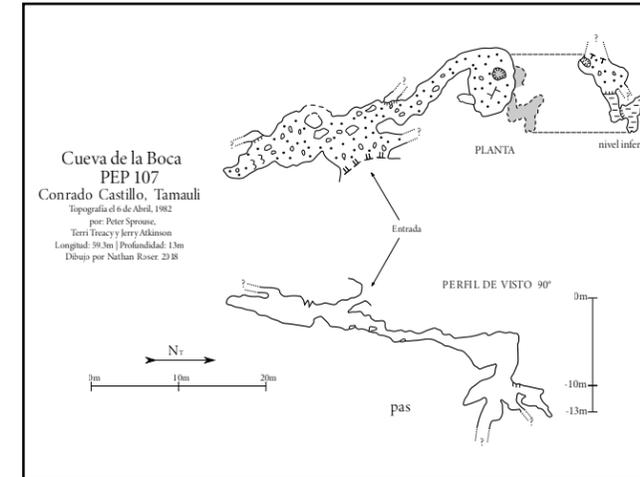
PEP82 Sótano del Fin del Mundo
 La Llorona, Tamaulipas
 Length: 15 meters Depth: 15 meters
 Coordinates: 459662, 2642126 NAD27 UTM

This cave was mapped 14 October 1985 by Paul Fambro, Pat Kambesis, and Peter Sprouse. It is a narrow pit, 15 m deep, plugged at the bottom with dirt, rocks, and organic debris. (BLS)



PEP147

This cave was mapped 14 October 1985 by Paul Fambro, Pat Kambesis, and Peter Sprouse. It is a narrow pit, 15 m deep, plugged at the bottom with dirt, rocks, and organic debris. (BLS)



Sótano de la Cueva
 Las Chinas, Tamaulipas
 Length: 70 meters Depth: 30 meters
 Coordinates: 454567, 2640771 NAD27 UTM

This pit is along a road in a wide, densely vegetated sinkhole about 10 m deep. At 10 m, it narrows and splits into two parallel pits. Both are well decorated and plugged with rocks and dirt. The eastern pit goes to a depth of 23 meters, the western pit to a depth of 30 m. This cave was mapped 17 October 1986 by Bill Farr and Carol Vesely. (BLS, PS)

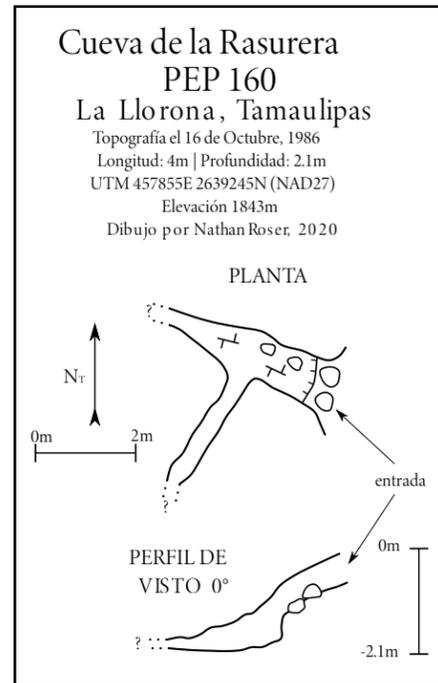
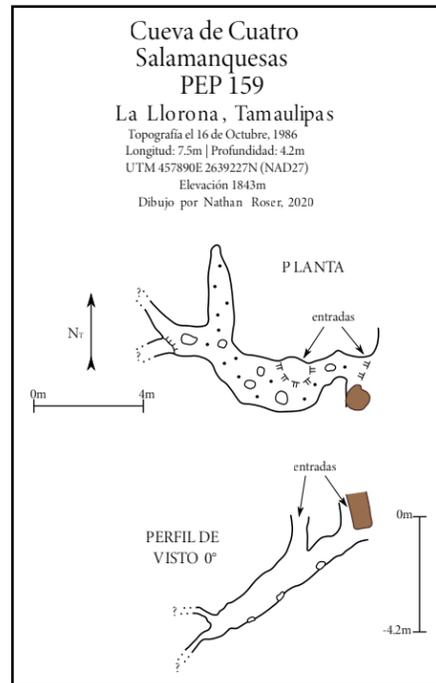
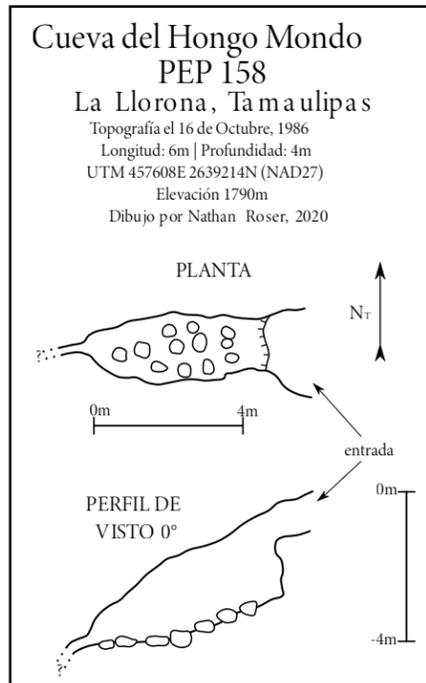
Cueva de la Grieta
 Los San Pedros, Tamaulipas
 Length: 31 meters Depth: 3 meters
 Coordinates: 461572, 2638541 NAD27 UTM

This cave was mapped 28 November 1986 by Aspen Adams, Rosa Lockett, and Susie Lasko. No profile was drawn. A small climb-down entrance leads to a fracture controlled horizontal crawlway about 30 m long. The passage heads west-northwest. Exploration ended at a very small, very low bedding plane. (BLS)

Pozo de la Orquídea
 La Llorona, Tamaulipas
 Length: 25 meters Depth: 23 meters
 Coordinates: 458272, 2641991 NAD27 UTM

This cave was mapped 14 October 1986 by Terri Treacy. A northeast-southwest fissure forms a narrow pit that drops 25 m, with a small drain at the bottom. (BLS)





Cueva de Hongo Mondo
 La Llorona, Tamaulipas
 Length: 6 meters Depth: 4 meters
 Coordinates: 457574.81, 2639414.81 NAD27 UTM

This small remnant cave is one of a trio of small caves mapped on 16 October 1986 by Dave Bunnell, Dale Pate, and Mary Sakry. It is only a few meters long, and is plugged with dirt and rocks. (BLS)

Cueva de Cuatro Salamanquesas
 La Llorona, Tamaulipas
 Length: 8 meters Depth: 4 meters
 Coordinates: 457857, 2639428 NAD27 UTM

This is the second tiny cave in the trio mapped 16 October 1986 by Dave Bunnell, Dale Pate, and Mary Sakry. Two small climb-down entrances lead to a steeply dipping crawlway that quickly branches into multiple too-small passages. (BLS)

Cueva de la Rasurera
 La Llorona, Tamaulipas
 Length: 4 meters Depth: 2 meters
 Coordinates: 457822, 2639446 NAD27 UTM

A tiny entrance leads to a short passage trending northwest, which is intersected by an equally short passage trending southwest. Both passages quickly become impassably small. This cave was mapped on 16 October 1986 by Dave Bunnell, Dale Pate, and Mary Sakry. (BLS)

PEP158 Cueva Tortuga
 Conrado Castillo, Tamaulipas
 Length: 8 meters Depth: 4 meters
 Coordinates: 451230, 2652151 NAD27 UTM

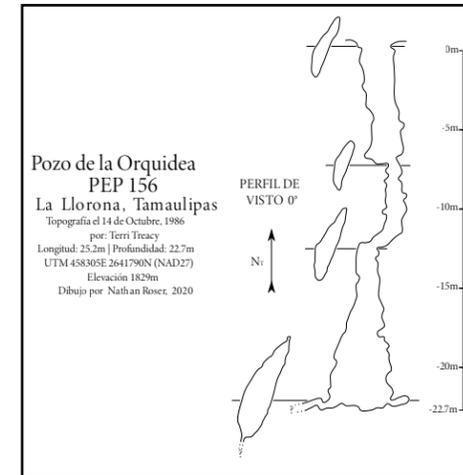
A crawl-in entrance opens into a short and steeply dipping crawlway that trends south for about 8 meters until it gets too small. This was taking air, and could a rathole entrance to Sótano de la Cuchilla. It was mapped on 27 December 1991 by Dale Chase, Jed Mosenfelder, and Peter Sprouse. (BLS, PS)

PEP159 Pozo Lucha de Culebra
 Conrado Castillo, Tamaulipas
 Length: 9 meters Depth: 9 meters
 Coordinates: 451067, 2652509 NAD27 UTM

This small cave was mapped 27 December 1991 by Dale Chase, Jed Mosenfelder, and Peter Sprouse. A narrow pit drops 9 meters into an east-west trending fissure plugged by dirt and rocks. (BLS)

PEP160 Sumidero Tiranosaurio Rex
 Garza, Nuevo León
 Length: 1113 meters Depth: 130 meters
 Coordinates: 24.0351285 -99.6658422 NAD83 lat/lon

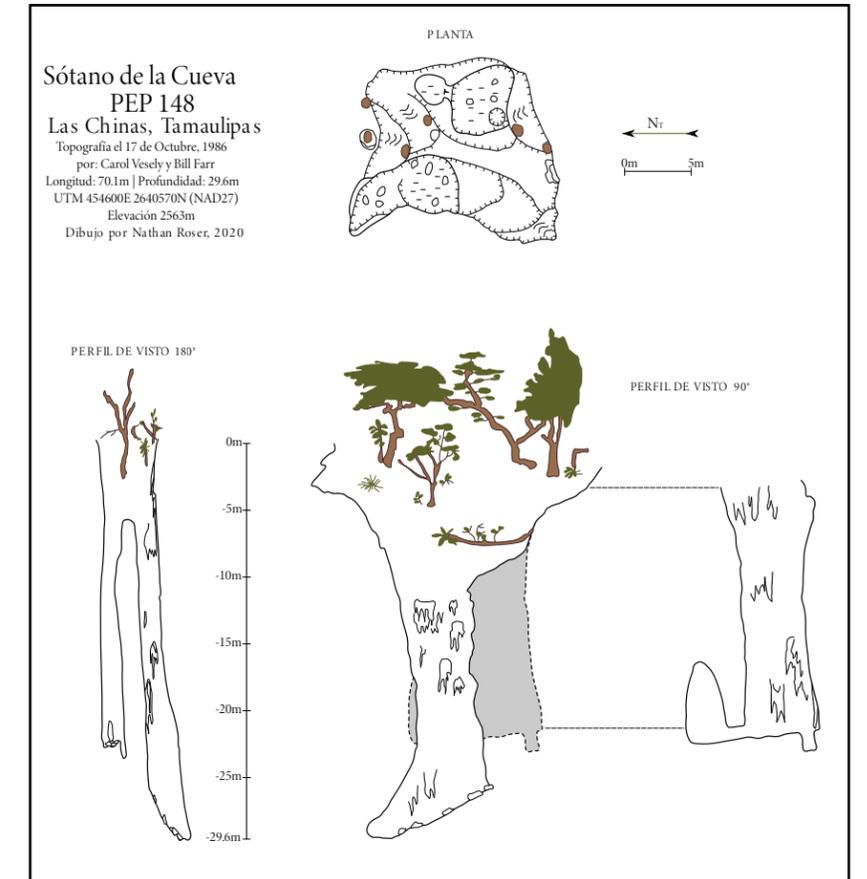
This cave is located 1.75 km southeast of the village of Garza, in the Aramberri municipality. It is situated in a drainage below a shale contact, like other sinking stream caves in the "Cretaceous Park" area. The entrance is 20 m wide and slopes to the northwest as an impressive borehole for about 80 m. An extensive maze of lower levels underlies the entrance passage and connects



back in at the bottom of it. From there a single streamway descends to a series of drops. Then it levels out in more streamway that eventually becomes too tight. (PS)

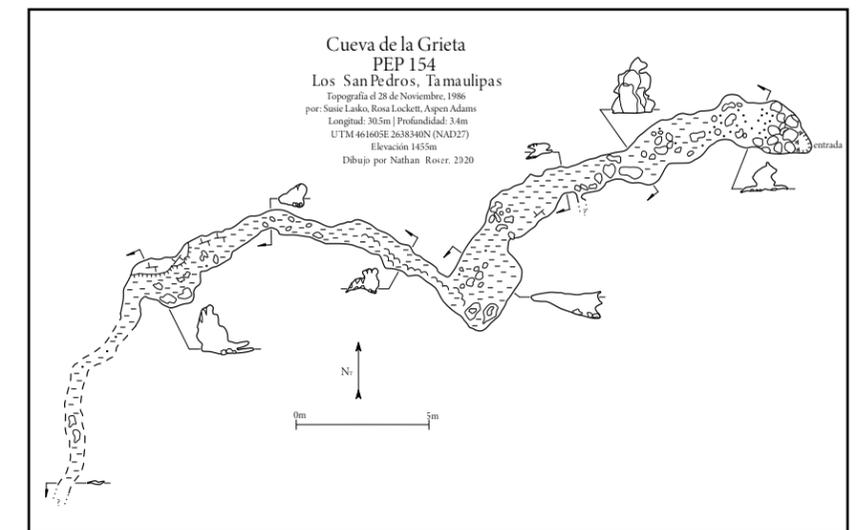
Pozo de la Vuelta Mala **PEP443**
 Cuauhtemoc, Nuevo Leon
 Length: 53 meters Depth: 52 meters
 Coordinates: 452660, 2641086 NAD27 UTM

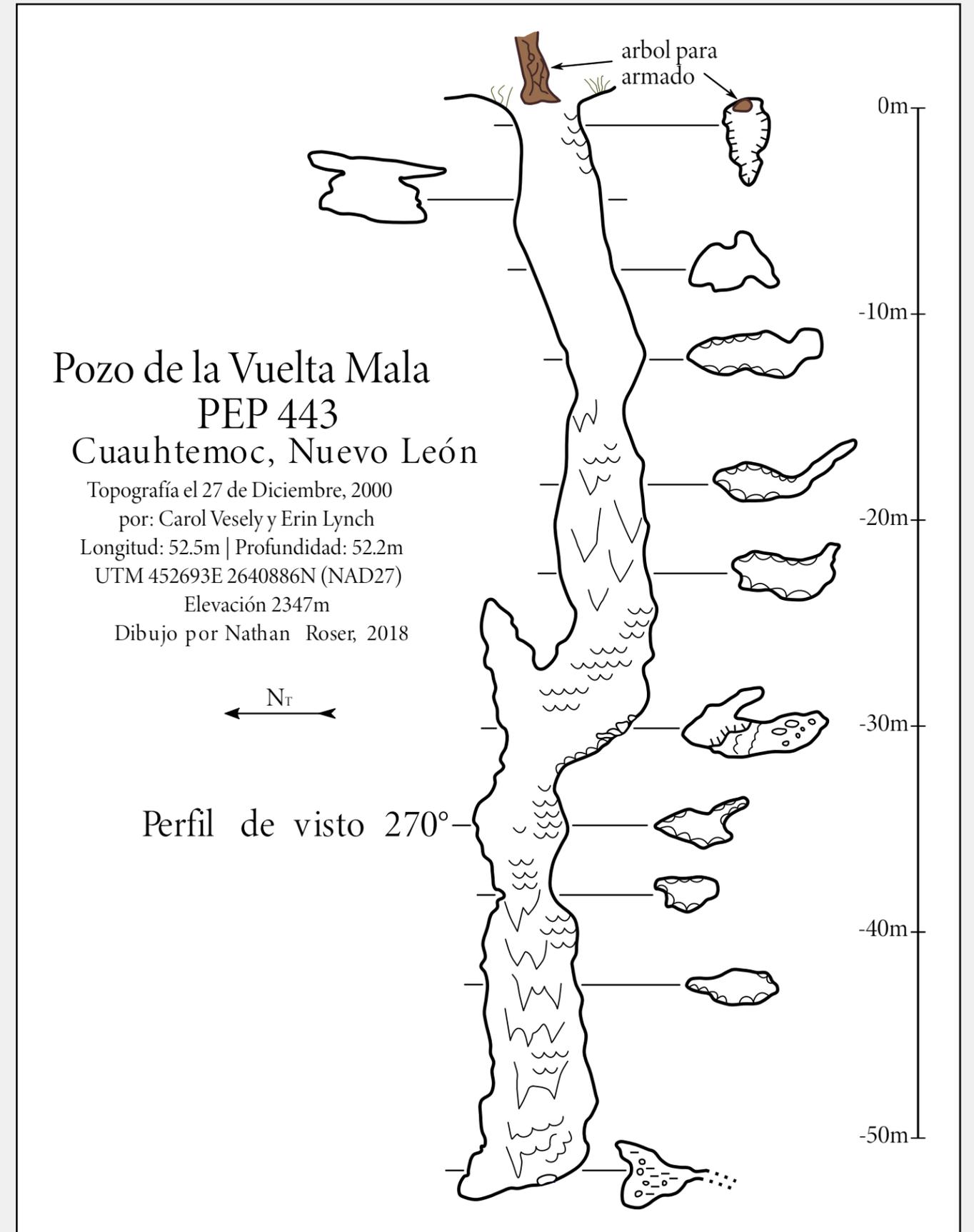
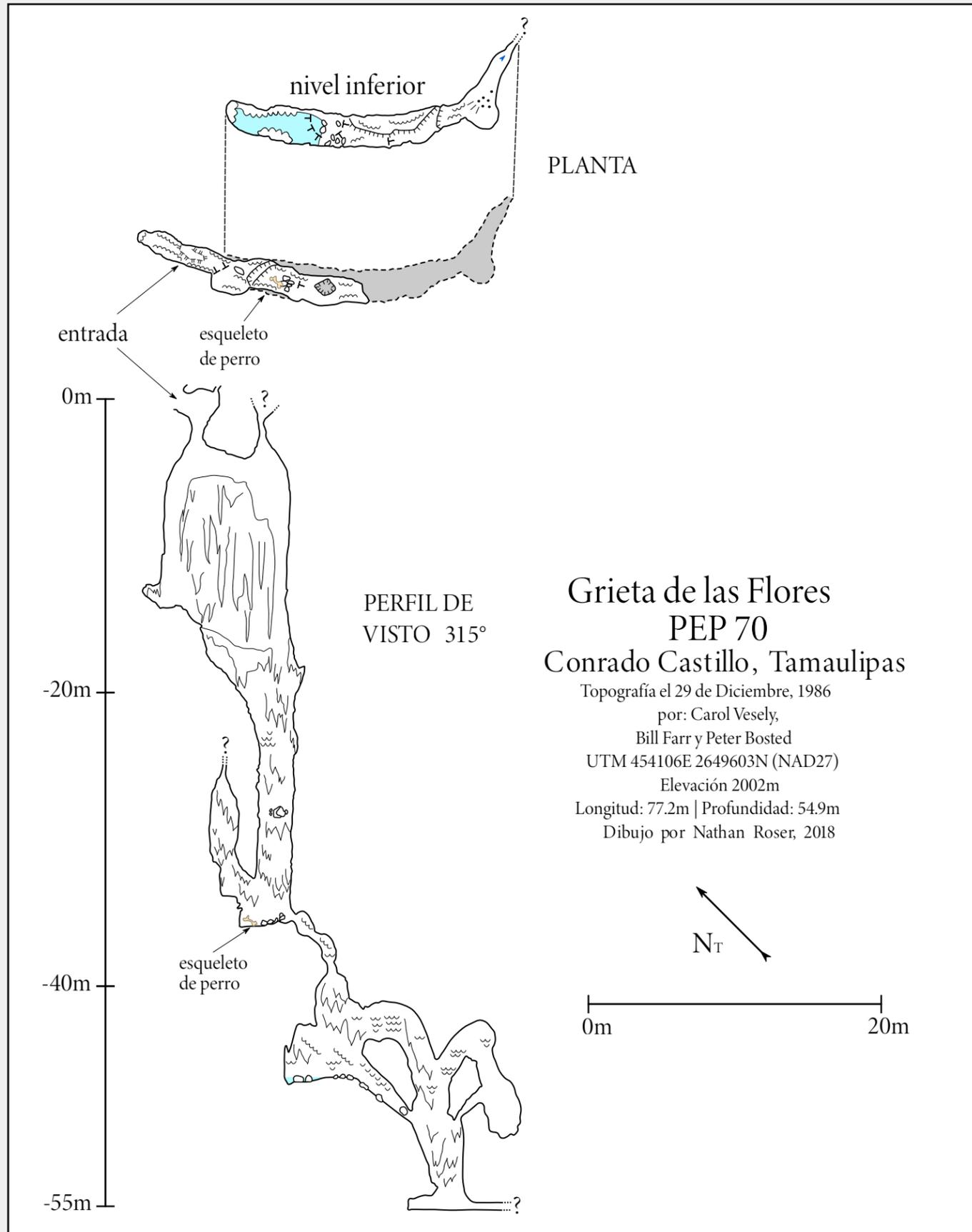
This narrow pit drops 30 m to a sloping ledge covered with boulders before dropping another 20 m to a plug of dirt and rocks. The bottom 20 m of the cave is well decorated. It was mapped on 27 December 2000 by Carol Vesely and Erin Lynch. A tiny drain exits the bottom of the cave. No airflow was noted. (BLS)

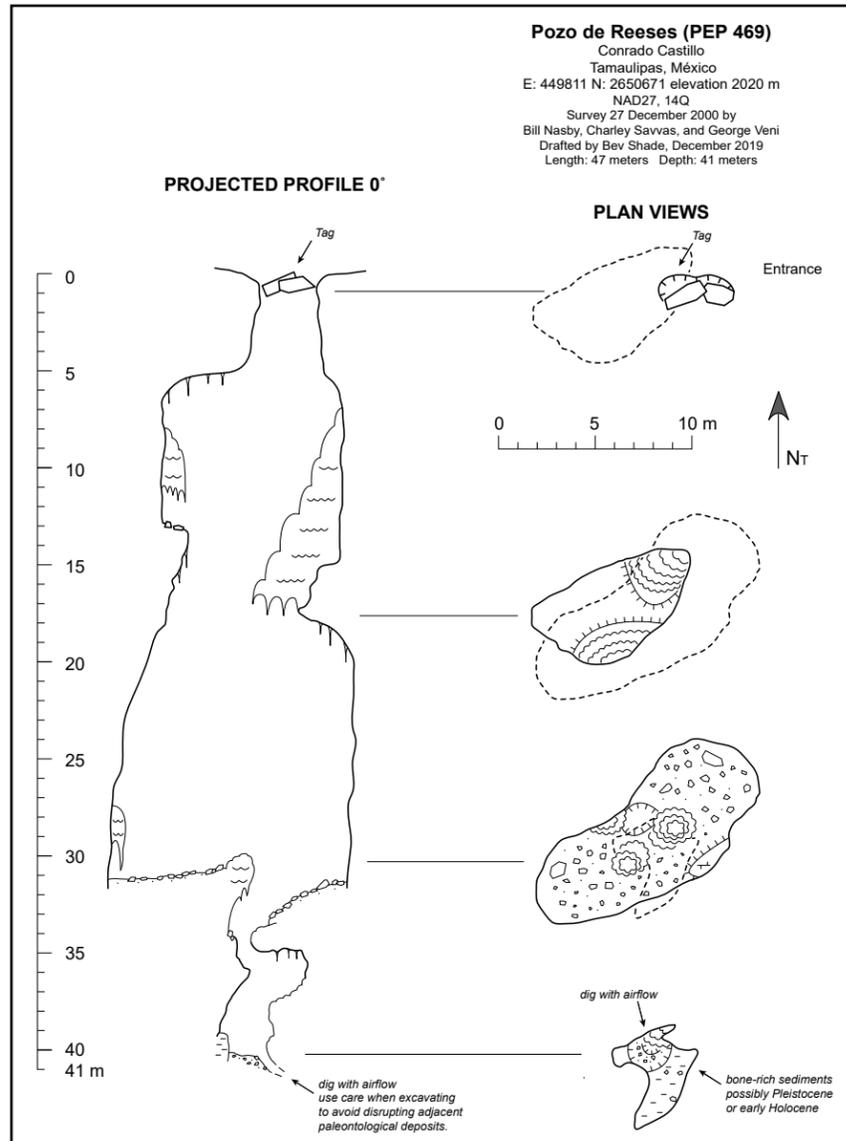


Pozo de la Metalera **PEP445**
 Revilla, Tamaulipas
 Length: 14 meters Depth: 8 meters
 Coordinates: 452589, 2644548 NAD27 UTM

This small pit is located at La Metalera. It is developed along a southeast-northwest trending fracture. Two entrances drop 4 m in parallel shafts before merging. The pit continues 4 m deeper to a plug of rocks, dirt, leaves, and pine needles. This pit







Cueva del Hombre Dormiendo PEP450
 Las Chinas, Tamaulipas
 Length: 8 meters Depth: 2 meters
 Coordinates: 454117, 2641099 NAD27 UTM

A crawl-in entrance leads to a low chamber 6 m long x 4 m wide. An enlarged fracture in the ceiling makes a narrow space where a person can stand up. The floor of the room is composed of dirt and rocks. Some weathered formations are present on the ceiling near the entrance. This cave was mapped 2 January 2001 by Brian Farr, Carol Vesely, and Cathy Winfrey. It was located by an expedition base camp, and named because Bill "Carlos" Nasby was sleeping in it. (BLS, PS)

Pozo de Reeses PEP469
 Conrado Castillo, Tamaulipas
 Length: 47 meters Depth: 41 meters
 Coordinates: 449778, 2650872 NAD27 UTM

This Pit is located on a hilltop southwest of Los Caballos. The entrance is 3.5 m long by up to 1 m wide, divided in two by large rocks covering part of the pit. Most of the cave consists of a 31 m deep pit that enlarges to about 10 m long by 4 m wide at its base. Roughly halfway down the pit, a flowstone slope along the north wall forces a rebelay or re-direction in the rope. In the middle of the mostly rocky soil floor are two small stalagmites. The floor slopes steeply beneath them, dropping through a body-size hole to a depth of 41 m where the cave continues down through a small hole in the floor with airflow. It will likely take a substantial amount of digging to find more open passage. If

digging is attempted, caution is needed to avoid disturbing a nearby deposit of bone-rich sediment. Based on the color of the sediment, the deposit is estimated as early Holocene to late Pleistocene in age. In December 2000, a local resident (David Ledesma) guided Dale Chase to this pit near Agua de las Vacas. Along the way, Dale introduced David to the joys of Reese's Peanut Butter Cups, hence when Bill Nasby, Charley Savvas, and George Veni explored it on 27 December 2000, they named it Pozo de Reeses. (GV)

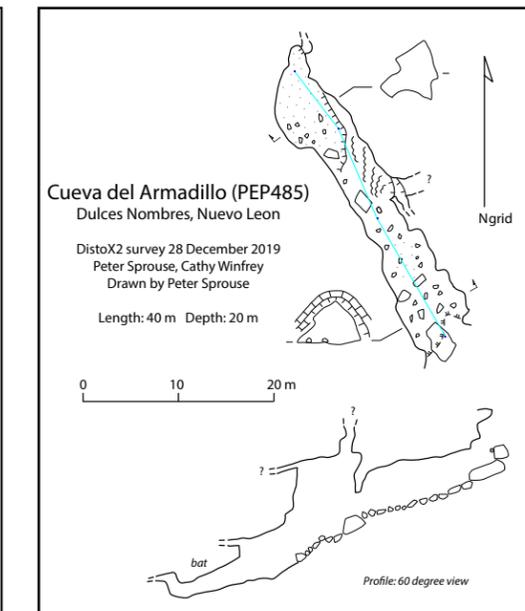
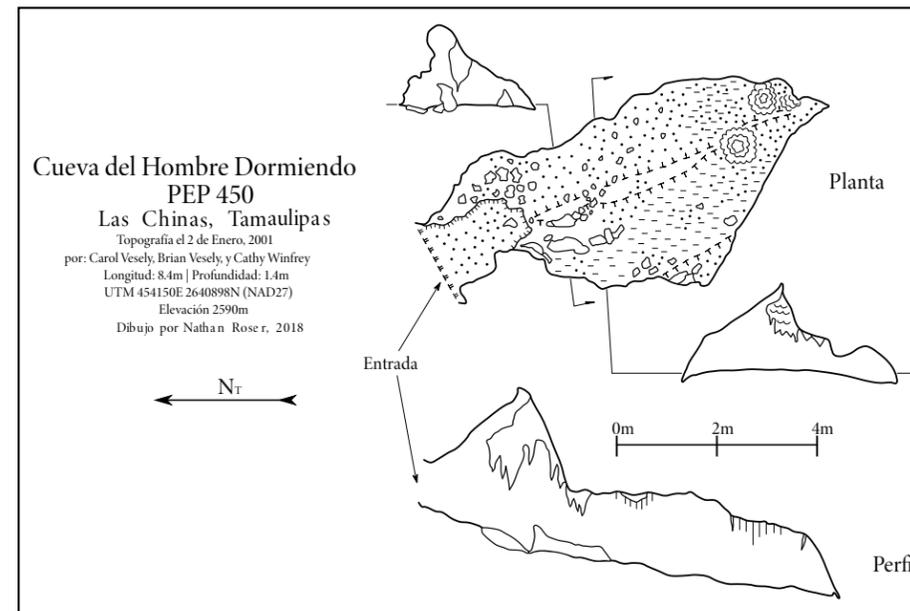
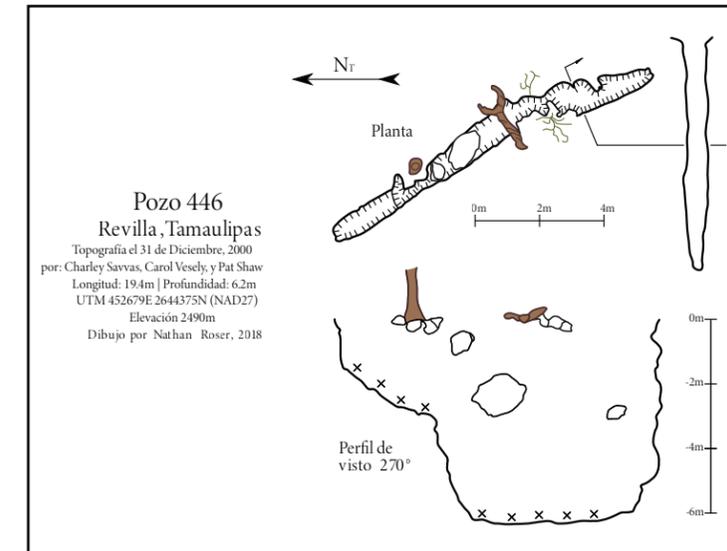
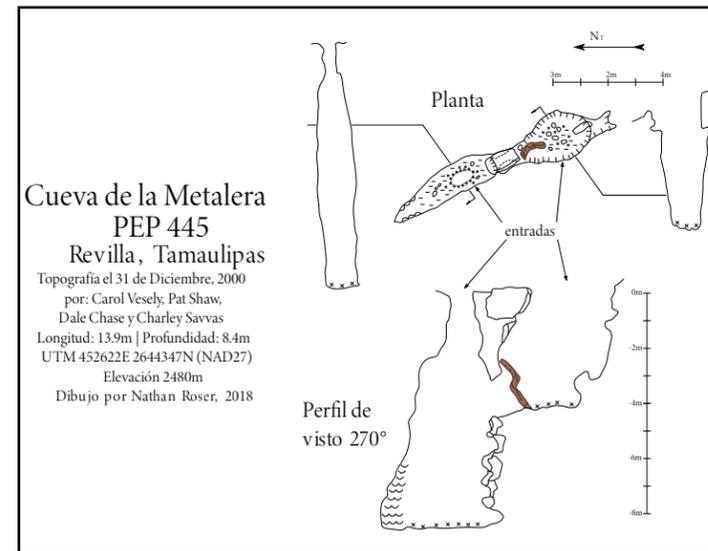
Pozo del Maguey Rojo PEP475
 El Ranchillo, Tamaulipas
 Length: 62 meters Depth: 60 meters
 Coordinates: 453592, 2637407 NAD27 UTM

A 3 m long x 2 m wide entrance drops about 30 m to a steeply dipping dirt floor before dropping again to a depth of 60 m. The top half of the pit is wider, up to 4 m wide, while the bottom half

was shown to Brian Farr, Pat Shaw, Peter Sprouse, and Carol Vesely on 30 December 2000 by Chuy Torres of Revilla. It was mapped the next day by Dale Chase, Carol Vesely, Charley Savvas, and Pat Shaw. (BLS)

Pozo 446 PEP446
 Revilla, Tamaulipas
 Length: 19 meters Depth: 6 meters
 Coordinates: 452646, 2644576 NAD27 UTM

This cave was mapped 31 December 2000 by Carol Vesely, Charley Savvas, and Pat Shaw. This small pit is developed along a southeast-northwest trending fracture. The entrance is 11 m long x 1 m wide. It drops about 6 m before becoming very narrow and being plugged with organic material. (BLS)



is quite narrow. The bottom of the cave is plugged with rocks, with a tiny drain continuing down. No air was noted. This pit was mapped 4 January 2001 by Matt Covington, Linda Palit, and Charley Savvas. (BLS)

Cueva del Coliflor PEP560
 El Viejo, Nuevo Leon
 Length: 110 meters Depth: 32 meters
 Coordinates: 23.98473, -99.68735 NAD83 lat/long

The cave is named for some heavily eroded formations in the entrance that had a cauliflower shape. A short entrance pit leads to a wide ledge before dropping another 15 m down a flowstone slope. A third pitch, 14 m deep, leads to a pleasant chamber 15 m long x 8 m wide. It was possible to climb about 15 m up the narrow infeeder at the end of this chamber, but it gets very narrow, without airflow. At the top of the third pit, a traverse along the east side of the pit leads to an infeeder to a 7 m long x 5 m wide chamber floored by flowstone with fresh guano. A passage

can be clearly seen coming into the top that would require a 5 m climb. This leads looks great, but it is located very close to the surface and air was felt. Cueva del Coliflor was discovered 26 June 2019 by Ken Demarest, Tom Rogers, Cruz St. Peter, and Liliana Wolf. It was mapped on 28 June by Ken, Lili, and Bev Shade. Ollie Wilson went with them to the cave but it turned out to be vertical right away, so after a few survey shots, Lili was kind enough to hike back to camp with Ollie. Their GPS ran out of battery right away as it became very foggy, so they had an adventure getting back to camp but eventually made it. Ken and Bev finished mapping. (BLS)

Pozo de Schoenocaulon Morado
Las Chinas, Tamaulipas
Length: 7 meters Depth: 6 meters
Coordinates: 23.851663, -99.451503 NAD83 lat/long

The pit was named for an impressive feather-shaped purple flower near the entrance. It is otherwise unremarkable, with a 2 x 1 m entrance dropping 7 m to a dirt and rock floor that plugs it. Pozo de Schoenocaulon Morado was explored 20 June 2021 by John Benac, Carlos Ortega and Bev Shade while ridgewalking east of camp. (BLS)

Cueva del Colonule
La Llorona, Tamaulipas
Length: 13 meters Depth: 5 meters
Coordinates: 23.8802200, -99.4184600 NAD83 lat/long

Cueva Colonule is a small cave that starts and ends as a belly crawl and is never tall enough to stand. The passage appears to be phreatic in origin, following the strike of the rock. The passage quickly becomes too tight. No air was noticed. Organic matter, including some dry mammal scat was observed. This cave was explored and mapped by Ben Hutchins and Ron Rutherford on 23 March 2022. (BH)

Cueva Cuatro Tiros
La Llorona, Tamaulipas
Length: 21 meters Depth: 10 meters
Coordinates: 23.8732300 -99.4160500 NAD83 lat/long

Cueva Cuatro Tiros is a small cave in the bottom of a shallow valley next to a logging road, named because it was surveyed in four shots. Two entrances lead to a small room with a breakdown ceiling. A tight squeeze through the breakdown floor leads to a short walking passage that quickly ends. A small, unpromising plug in the floor could be dug, but no air was observed. This cave was explored and mapped by Ben Hutchins and Ron Rutherford on 23 March 2022. (BH)

Pozo de Heather
Las Chinas, Tamaulipas
Length: 17 meters Depth: 13 meters
Coordinates: 23.85386, -99.45272 NAD83 lat/long

At the bottom of a bowl-shaped sinkhole composed of dirt and rocks, a narrow bedrock pit drops 13 m to a well-decorated crevice passage. The fissure trends north-south, and is plugged by dirt, rocks, and organic debris. The cave was named for John's wife Heather who was back home, due to deliver a child soon. Pozo de Heather was explored 19 June 2021 by John Benac and Bev Shade. (BLS)

PEP565 Cueva Rayito del Solito
Chupaderos, Nuevo Leon
Length: 16 meters Depth: 14 meters
Coordinates: 23.970292, -99.700272 NAD83 lat/long

A 3 meter diameter pit drops 16 meters to a 2 x 1 m floor of dirt. There is a small drain exiting the pit. The cave was named for a sunbeam that reached the bottom of the pit. This cave was mapped 28 June 2019 by Cait McCann, Tom Rogers, Ron Rutherford, and Cruz St. Peter. (BLS)

Cueva Pantín Colgado
El Viejo, Nuevo Leon
Length: 73 meters Depth: 54 meters
Coordinates: 23.96768, -99.68558 NAD83 lat/long

A 3 x 4 m entrance drops into a 54 m deep pit that bells out just below the entrance. The pit is plugged with rocks, dirt, and organic material. The cave was named when a foot ascender got stuck on rope and caused a hassle. It was mapped 26 June 2019 by Cait McCann, Ron Rutherford, and Matt Schram. (BLS)

Pozo de Lagartija Colgada
Las Chinas, Tamaulipas
Length: 11 meters Depth: 9 meters
Coordinates: 23.85789, -99.45252 NAD83 lat/long

A wide shallow dirt sinkhole has a small bedrock pit entrance in its southwest corner. The small entrance opens into a well-decorated narrow fissure that drops 11 m to a mud plug. Subsidence in the mud indicates that the pit takes water and is continuing to move material down into the underlying cave. This cave was mapped 19 June 2019 by Carlos Ortega and Bev Shade. It was named for a dead lizard suspended by a spider web in the entrance. (BLS)

Pozo Yerbita Buena
Las Chinas, Tamaulipas
Length: 22 meters Depth: 20 meters
Coordinates: 23.8507, -99.4537 NAD83 lat/long

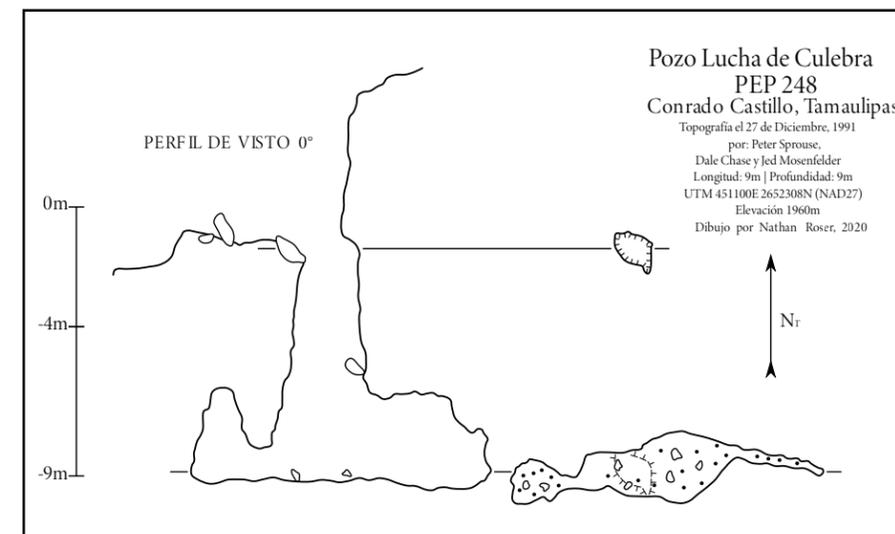
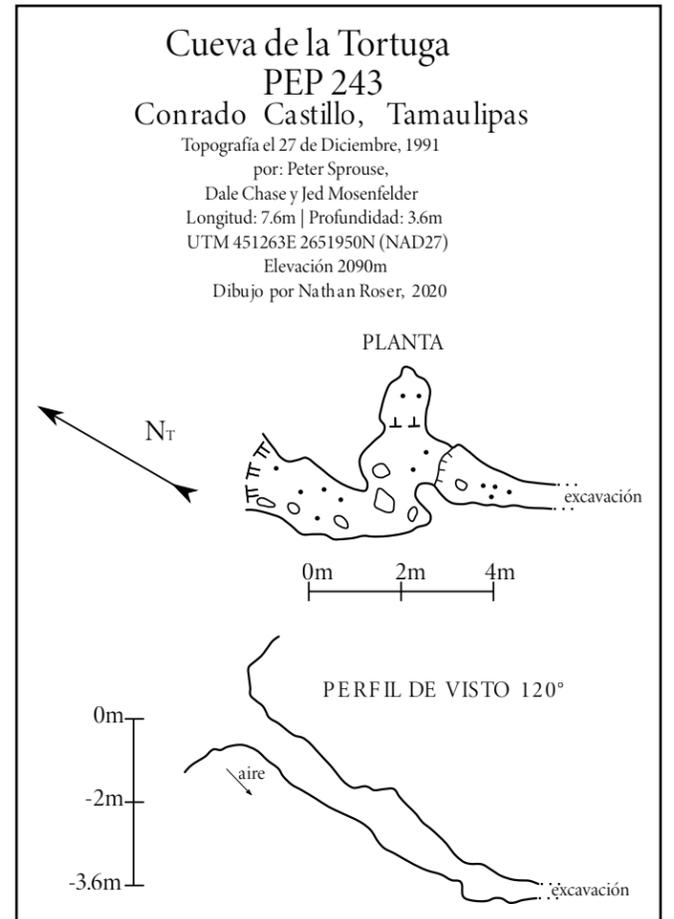
This pit is in the middle of a dense thicket, by a short but study tree. Ridgewalking in this area might be described as ridge crawling. A 4 m diameter bedrock pit drops 4 meters to a floor of dirt and rock that almost blocks the cave, but a narrow drain from this floor drops another 18 m. Past the drain, the walls of the pit are completely covered by flowstone. The pit is plugged by dirt, rocks, and organic debris. This cave was mapped on 23 June 2021 by Bev Shade and Abigail Mack following a long and fairly unproductive hike. The hike was unproductive enough that this cave looked good. It is named for fragrant mint around the entrance. (BLS)

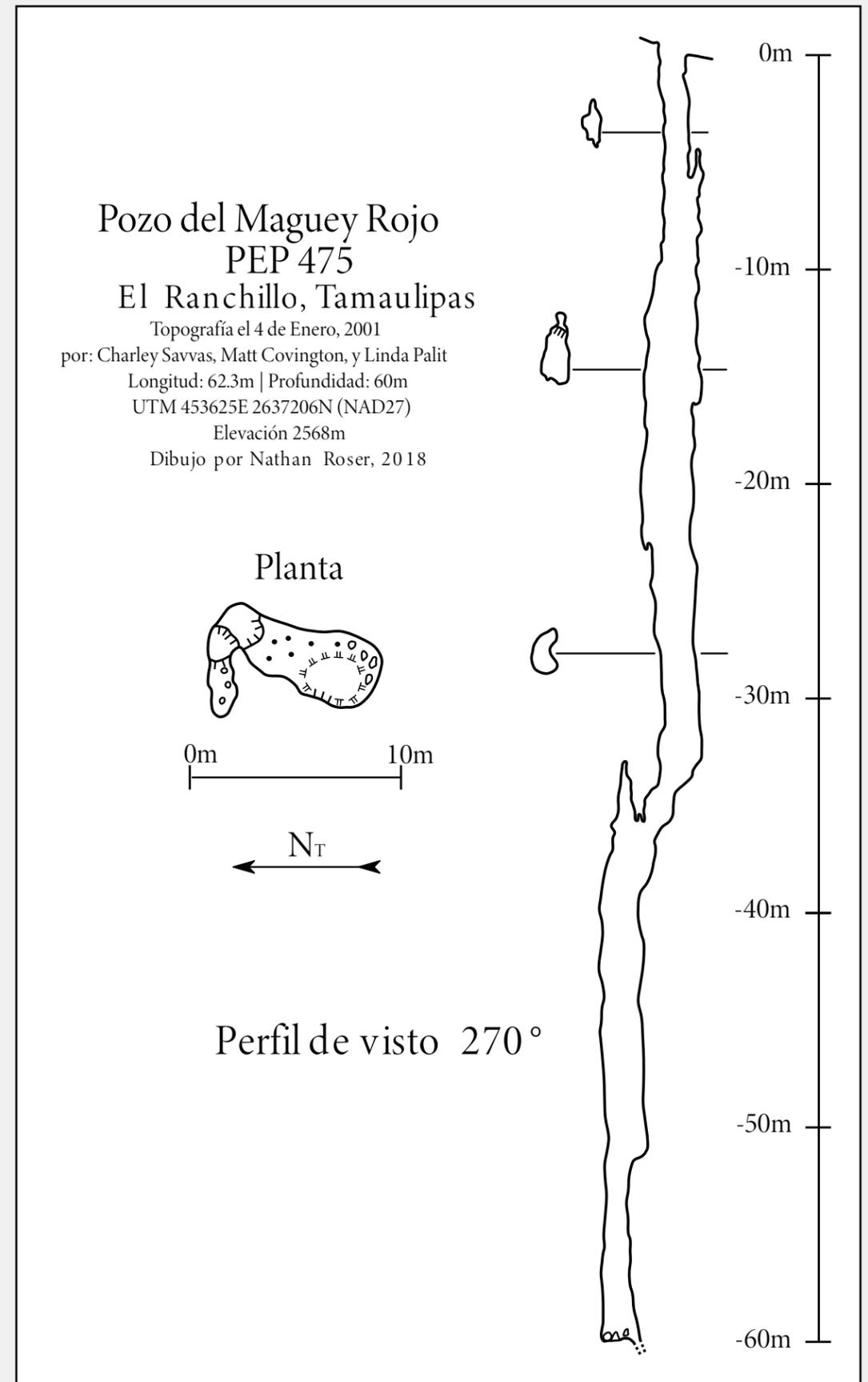
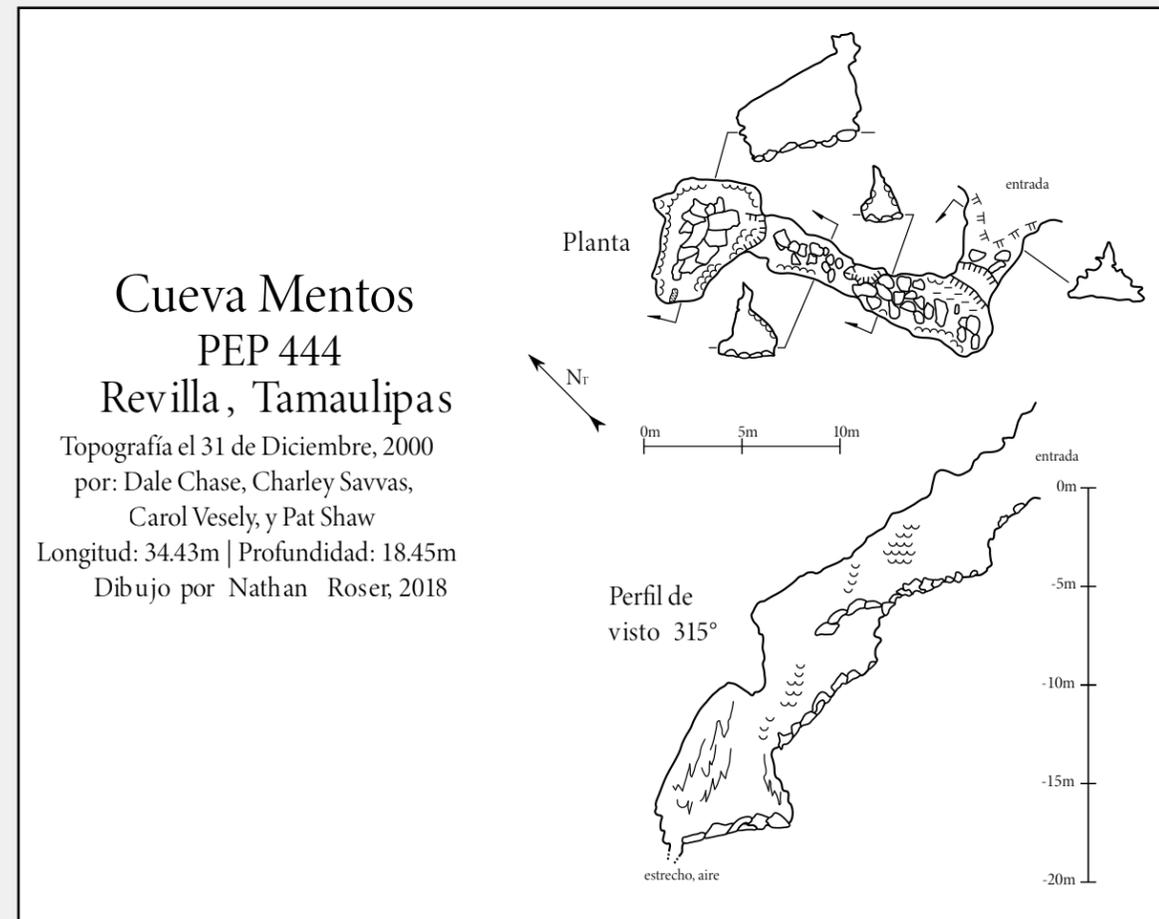
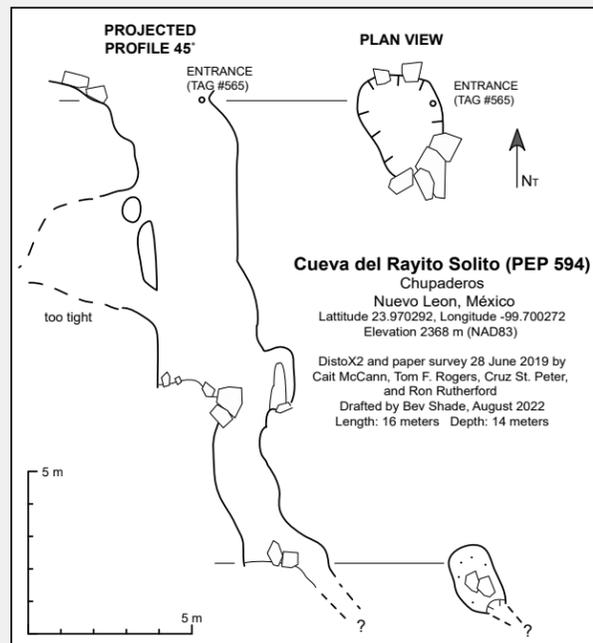
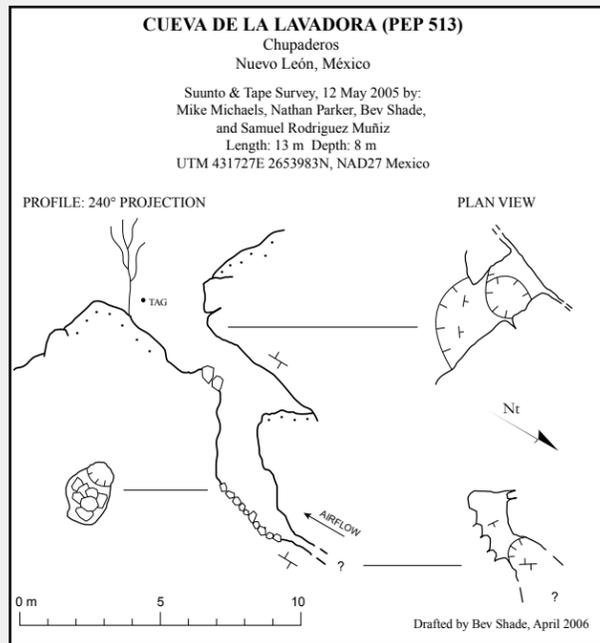
Pozo Historia Sin Fin
Las Chinas, Tamaulipas
Length: 156 meters Depth: 123 meters
Coordinates: 23.8555600, -99.4544680 NAD83 lat/long

Like several other pits nearby, this cave is almost perfectly vertical. Despite a very small entrance, sunlight was still visible at a depth of 70 m, and there is considerable danger of rockfall to the bottom of the cave, as there is loose material around the entrance, as well as loose mud and rocks on the walls of the pit. The cave is characterized by extremely tenacious mud that rendered vertical gear almost useless. The good news is that the cave continues from the last point of exploration at -123 m, and is worth returning to!

A large shallow surface sink (16 m diameter x 2 m deep) is plugged with dirt, rocks, and organic material. Uphill of the surface sink on the northwest side, a small opening less than 0.5 m diameter blew good air. This opening was enlarged and revealed solid bedrock walls more than halfway around, and the other side was groomed to remove all large rocks. The entrance was then about 1 m diameter, and after dropping about 8 m, the pit enlarges significantly. At a depth of about 25 m, a parallel pit enters from the south. This is certainly coming from the large, plugged surface sink.

The pit continues down to a prominent ledge at a depth of about 65 m. It is not a clean drop; the narrow pit and irregular pit walls required quite a few rebelay. At a depth of about 70 m, the pit splits into two parallel pits, which rejoin 10 m lower. From there, the cave has a tiny bit more horizontal development, trending northeast down 2 pitches with lots of mud and flowstone. The second pit is split by a thin bedrock flake, but both sides of the flake can be accessed at the bottom of the cave. At a depth of about 120 m, an actual floor is encountered, where the main part of the pit is plugged with mud and rocks. There are two small drains that will probably lead to the same underlying pit. This cave was discovered 23 June 2021 by Peter Sprouse and Isabel Grajales. It was mapped 24-25 June by Edgar Garcia, Abigail Mack, Carlos Ortega, Bev Shade, and Mowgli Swartz. (BLS)





Pozo Panqueque PEP559

Las Chinas Area, Taumalipas, Mexico
 Proyecto Espeleological de Purificacion

Surveyed December 24-29 2009 By :
 Joe Datri, Lacey Heath, Sean Lewis, Ellie Theone, Emily Zuber
 Survey Possible Through Additional 2009 Mesas Juarez PEP Participants:
 Don Broussard, Nico Escamilla, Paul Fambro, Bill Steele, Diana Tomchick
 Cartography Summer 2010 by S. Lewis

