

# **Introduction to the Rio Frio Regional Archaeological Project (RiFRAP): History, Scope, and Aims**

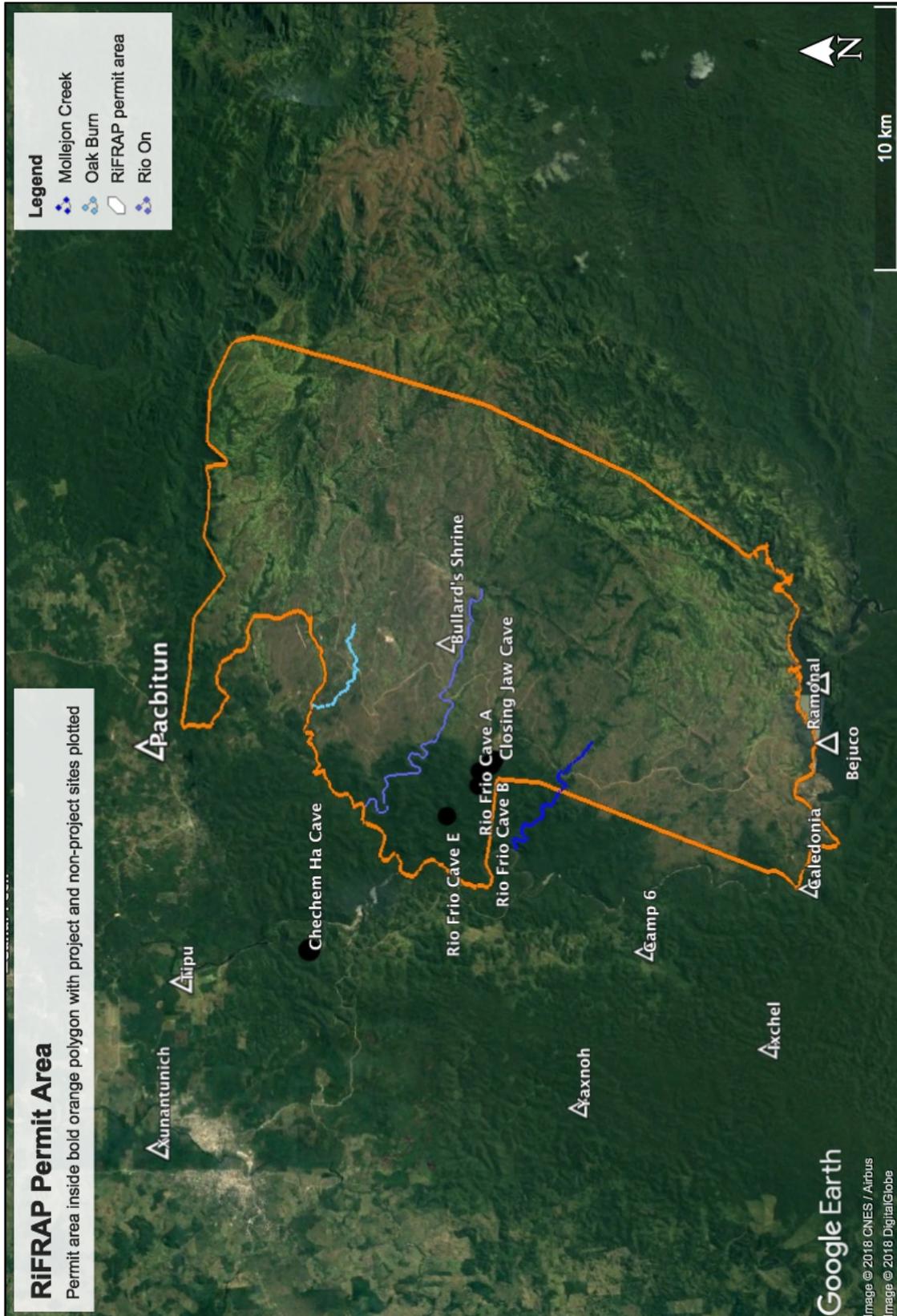
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The Rio Frio Regional Archaeological Project (RiFRAP) was initiated in June 2018 as the foundational season of the first long-term archaeological investigation of the Rio Frio caves and the surrounding Mountain Pine Ridge region (Figure 1). Only six short-term archaeological research projects have been conducted in the permit area, yet they have revealed an array of ritually-used landmarks including caves, rockshelters, bedrock outcrops, boulders, and stone cairns. Unfortunately, for multiple reasons, little of the data have been published in detail, making the Rio Frio Caves and the Mountain Pine Ridge archaeological *terra incognita*. What is known of the sites is that they were likely used most often during the Late to Terminal Classic periods, although some Postclassic material has been recovered; they are far from any known substantial settlement; the people who used them were more closely culturally affiliated to the Maya of the Belize Valley, and especially Xunantunich than they were to the Caracol sphere of influence. The lack of investigations in this region is surprising as it has long been recognized as a source of economically vital resources for the pre-Hispanic Maya including granite for making ground stone tools, slate used throughout the Belize Valley for burial architecture, monuments, and other portable artifacts, and pine wood for domestic and ritual purposes (Graham 1987; Healy et al. 1995; Lentz et al. 2005; Morehart et al. 2005).

## **Location and Geography of the Study Area**

The RiFRAP study area is demarcated to the north by the Maya Mountains ridge line between the Chiquibul Road and Thousand Foot Falls (**Figure 1**). With the exception of a small peninsula at the Chalillo Dam, the southern boundary of the permit area is the Macal River and the north shore of Cahllillo lake. The eastern boundary runs along a ridge line in the Mountain Pine Ridge from Thousand Foot falls to a small creek just downstream from the Macal River and Raspaculo River junction. As of 2018, the western boundary begins along the south and southeast boundary of the Pacbitun Regional Archaeological Project's permit area, which includes the Georgeville/Chiquibul Road from the intersection of the Maya Mountains ridge line to the north, proceeds to Privacion Creek, which it follows to the Macal River. The RiFRAP's western boundary continues along the Macal River until it reaches an oxbow in the river, approximately the same latitude as the southern road in Douglas da Silva Forest Station at which point it stretches 3.3 km inland. The western boundary turns to the south again where it skirts along the feet of the hills of the caves investigated by the Belize Cave Research Project, continuing overland until reaching the Macal River at the second major bend in the waterway downriver from the Guacamallo Bridge crossing (Figure 1). GPS coordinates of the northeast, northwest and southwest corners were collected. Time and the need for proper transportation did not allow for a coordinates to be collected for the southeast corner, although doing so will be a

primary focus of the 2019 field season. Coordinates for these corners are reported below in **Table 1**.



**Figure 1.** Satellite image of permit area outlined in orange polygon and showing surrounding some archaeological sites within and outside permit area.

**Table 1.** GPS coordinates of permit area corners

Point name	Easting	Northing	Comment
Northeast corner	88°50'52.74"W	17° 3'38.10"N	Secure point, no need for revision
Northwest corner	88°59'10.38"W	17° 4'51.84"N	Secure point, no need for revision
Intersection with PRAP permit SE corner	88°56'54.08"W	17° 2'5.	Secure point, no need for revision
Southwest corner	16°52'5.34"N	16°52'5.34"N	Active road construction did not allow for safely accessing true corner, point taken from road, need to revisit in future
Southeast corner	N/A	N/A	Unable to access due to road conditions, need to revisit in future

Popular tourist and known archaeological sites within the permit area include; the Rio On pools, Big Rock Falls, Thousand Foot Falls, Rio Frio Cave (Rio Frio Cave C; Mason 1928, 1940), Twin Caves (Rio Frio Caves A and B; Mason 1928, 1940), Closing Jaw Cave, Tunel Cave, Rio Frio Caves D and E (Anderson 1962; Pendergast 1970). Present too are an unnamed shrine recorded by William Bullard (Bullard 1963), and a series of stone cairns reported by Thompson (Thompson 1938), hereafter colloquially referred to as Bullard's shrine and Thompson's cairns respectively.

### Previous Archaeological Research in the Permit Area

With only five short-term projects conducted and published in the Mountain Pine Ridge (MPR)/ Rio Frio region, the area is largely archaeological *terra incognita* (Pendergast 1970:6). What little archaeology has been conducted in the region has focused on the Rio Frio Caves, first identified and excavated by Gregory Mason (Mason 1928, 1940), and two more recently discovered caverns described and excavated by A.H. Anderson in 1958 (Anderson 1962; Pendergast 1970). Two other projects investigated stone cairns (Thompson 1938), and a possible granite shrine (Bullard 1963) in the Mountain Pine Ridge proper. We note that the Rio Frio Caves are not geologically part of the MPR, but instead are part of a projection of the Vaca Plateau into its borders (Pendergast 1970). Most recently the Belize Regional Cave Project (BRCP) documented multiple caves in the Mollejoin Creek area to the south of Rio Frio on the same Vaca Plateau projection (Moyes and Awe 2015, 2016, 2017). No surface sites or evidence of significant settlement clusters have been reported anywhere in the Mountain Pine Ridge,

although some mounds have been identified near the Rio Frio Caves (Jaime Awe, personal communication June 2017). Mason's (1928) and Anderson's (Pendergast 1970) Rio Frio Cave investigations recovered ceramic artifacts, the majority of which can now be confidently placed in the Late to Terminal Classic (AD 700-900) through early Postclassic periods (AD 900-1200), with a few Early Classic period (AD 250-600) specimens collected. The BRCP had made similar findings (Moyes and Awe 2015, 2016, 2017). Investigations of the shrine and cairns failed to recover dateable artifacts, although Thompson (1938) reports finding *incensario* fragments with the latter, suggesting at least some of those features date to the Postclassic period. From a broader perspective, cave investigations in the western Belize Valley, Vaca Plateau, and northern Chiquibul have also documented extensive ritual use dating primarily to the Late Classic period, although many were first used in the Preclassic period (Awe 1998; Colas et al. 2000; Colas et al. 2008; Griffith et al. 2000; Ishihara et al. 2001; Mirro 2007; Moyes 2006; Moyes et al. 2017; Moyes et al. 2012; Moyes et al. 2015; Owen 2002; Reeder et al. 1998; Reeder et al. 1996). Moreover, many of these places were extensively modified and used for rain rituals (Moyes 2012; Moyes et al. 2009; Spenard 2014, 2017). For example, the mid-sized site of Las Cuevas in the Chiquibul Reserve is situated around a massive sinkhole cave opening (Moyes et al. 2012). Inside the cave, researchers have documented extensive architectural constructions, including terraces, retaining walls, and thickly plastered stairs and platforms (Moyes et al. 2012:225).

The earliest project in the greater Mountain Pine Ridge region was conducted by Gregory Mason in the late 1920s who located three caves in the Rio Frio region, which he labeled Caves A, B, and C (Mason 1928, 1940). Cave B is the smallest of the three caves and non-diagnostic utilitarian pottery was the most common encountered in the cavern (Mason 1928:11). At least one complete vessel, an unslipped spiked censer, was recovered from there, indicating the cave was used sometime in the Terminal to early Postclassic periods (Mason 1940:114-115). Cave A is a complex, multi-level cavern with two main passages and a large rock shelter connecting both. The rock shelter is approximately 3 m deep by 10 m long with entrances to the main passages penetrating the hill at either end of the landmark. One of the passages contains multiple subdivisions and chambers and ceramic sherds on the surface (Mason 1928:11-12). The other passage is the longer of the two. Its entrance had been partially blocked off in antiquity by wall of large stones, and it terminates at an underground stream. Multiple side passages branch off of the main conduit, at least three of which had also been walled off in the past (Mason 1928:18-20). Excavations and surface collections recovered ceramics in a wide array of styles and types such as simple, unslipped, sand-tempered bowls, unslipped plain ware and black slipped jars and bowls (likely Cayo Unslipped, Alexander's Unslipped, Mount Maloney Black, Negroman Punctated-Incised/Macaw Bank Unslipped types), as well as elaborate polychrome cups, bowls, and dishes, decorated with geometric, and curvilinear designs, and bands of pseudo-glyphs. Based on his published photographs, we tentatively suggest Cave A was most heavily used during the Late to Terminal Classic period (Mason 1928, 1940).

Mason (1928:28; 1940:113) describes Rio Frio Cave C is an impressively tall, yet relatively short (400 yards) cavern through which the Rio Frio flows underneath a hill by way of two gaping, 45 m-tall entrances. Many small chambers and side passages are present all of which contain ceramic sherds (Mason 1928:44). The most notable side passage is near the southeastern entrance of the cave. It measures 10 m long by 1 to 2 m wide. Non-systematic excavations within that small side passage revealed fragmented, disintegrated human skeletal remains and several

jadeite objects including ear spoons, and pendants (Mason 1928:35). Adjacent to the side passage was a large platform measuring 10 m long by 3 m high and 1 m tall excavated completely by Mason (1928:36). Those excavations revealed large deposits of ash and more jadeite objects. Moreover, he notes that dense sherd scatters lined the floor of the cave between the passage and altar (Mason 1928:38). Photographs published of ceramics collected in the altar excavations and collected from the floor scatter include polychromes, crude utilitarian jars, and spiked censers. The style and form of these published vessels suggest strong ties to the Belize Valley and date stylistically from the Late Classic through Postclassic periods.

Overall, Mason's (1928; 1940) reports are short, and read more like adventure journals with narratives of his explorations of the different areas of the caverns, and short descriptions and photographs of whole vessels recovered. Unfortunately, he never produced maps of the caves, nor did he attempt to analyze or synthesize the finds. Moreover, several times in the report, he mentions the inhabitants of the various caves, suggesting he believed the Maya were living in them, a view that contrasts sharply with current understandings of Maya cave use (Brady 2005).

In the late 1950s, A.H. Anderson recorded two new caves near those reported and investigated by Mason, labeling them Caves D and E (Anderson 1962; Pendergast 1970). Due to his untimely passing, and the destruction of his notes and journals wrought by Hurricane Hattie, and later theft of many objects for storage, Anderson only published one short account his work in the Rio Frio Caves (Anderson 1962), although David Pendergast was able to reconstruct much of the work done, as well as analyzed the remaining ceramics and miscellaneous artifacts from it (Pendergast 1970). Anderson (1962:329) simply describes Cave D as a small, dry cave close to Caves A and B with many undecorated olla sherds on the ground.

Two miles from Caves A and B, and with an average ceiling height of 12 m, and a single passage 158 m long by 35 m wide, Cave E is a much larger cavern than D (Pendergast 1970:6). Although no side passages have been documented there, several elevated alcoves and small niches dot the walls of the cavern, all but two of which had been looted prior to Anderson's initial trip there (Anderson 1962:330). Excavations on one of the intact elevated ledges located directly above a dense concentration of ceramics (discussed below), recovered a rich offering including several whole pots, including an olla filled with over 40 polished stone artifacts made from slate, jadeite, granite, and albeite (Pendergast 1970:47-48). Charcoal and wood recovered from the alcove was radiocarbon dated to AD 830 (Pendergast 1970:9).

Besides the alcoves, two main cultural areas are present in the cave, the first is a dense sherd concentration pushed up against one of the cave walls, excavated by Anderson over the course of a single day (Anderson 1962:330; Pendergast 1970:9). The concentration measured 3 m long by 1 m high (Anderson 1962:330). Overall, the ceramics reveal Cave E to have been one of great ritual significance to the Late Classic period Maya. Compared to other cave assemblages excavated through the 1960s, Cave E contained an unusually high percentage of polychrome ceramics compared to jars (Pendergast 1970:50). Moreover, the pottery indicated strong ties to the Belize Valley, and particularly Xunantunich, with very little contact with the Caracol or wider Chiquibul region. Pendergast (1970:49-50) speculates the connection between Cave E and

Xunantunich/Belize Valley is likely due to the Rio Frio being a tributary of the Macal River, connecting it directly with those sites to the north.

The other main cultural area in Rio Frio Cave E is a carved stalagmitic boulder resembling a seated human figure, and close to the midline of the rear of the cavern. Due to the overall lack of active dripstones in the cave's ceiling, the carved formation was likely moved to that spot by the Maya (Anderson 1962:331). No excavations were conducted around the figure, although it was cleaned off, revealing eight circular depressions carved into its front and top, and the sides are scored with diagonal lines (Anderson 1962:331). Cleaning activities revealed burnt wood, charcoal, and ceramic sherds with carbonized material still adhering to them (Pendergast 1970:8). Unfortunately, the material from the figure was never radiocarbon dated, and the only ceramics associated with it were olla body sherds, which could have been placed on the figure anytime in the past (Pendergast 1970:51). Nevertheless, both Anderson (1962:331), and Pendergast (1970:51) note this figure was likely worshipped as a god, with the latter tentatively suggesting it was the rain god, Chahk, an observation later noted for cave formations throughout the Maya area (Brady 1999; Navarrete and Martinez 1977; Spenard 2014; Stone 2005).

In 1938, J. Eric S. Thompson reconnoitered the northern section of the Mountain Pine Ridge for pre-agricultural deposits. None were found, although he documented and excavated a series of stone cairns piled up around erect slate shafts, many of which were placed on the highest points of the landscape (Thompson 1938:152). Very few artifacts were recovered during excavations of these features, limited to censer fragments and a stone biface; nevertheless, he proposed they were constructed by the Maya although no further time period was offered. Overall, he suggested the cairns were used by the ancient Maya much like mountain top shrines were used by the Chol and highland Maya into Colonial times (Thompson 1938:152). Their purpose remains uncertain; however, several were erected in the 1780s by Colonel Despard to mark the southernmost boundary of British settlement (Bullard 1963:98).

The fourth short-term archaeological research project conducted in the Mountain Pine Ridge centered on a shrine complex near the Rio On (Bullard 1963:98). The shrine consists of a large granite outcrop with a low bench or altar of slabs placed on its southside base, a stepped platform facing the outcrop, and a naturally rounded boulder placed in front of the platform, as if acting as an altar (Bullard 1963:98). No excavations of the shrine architecture were attempted, and concentrated surface collection efforts were only able to recover an obsidian flake blade and one non-diagnostic ceramic sherd. As with the cairns investigated by Thompson (1938), the layout of the shrine points to ancient Maya use although their exact period of use remains uncertain.

The BRCP has conducted the most recent archaeological research in the Mountain Pine Ridge along the Mollejon Creek southwest of Augustine/Douglass D'Sliva. The BRCP's primary aim is recording the most threatened cave sites throughout Belize (Moyes and Awe 2015:1). Their primary methodology for recording caves is to map them to archaeological standards and compile *in situ*, comprehensive inventories on all artifacts encountered. The BRCP has recorded up to seven caves in the region, but only thoroughly investigated four of them, although most remain unpublished (Moyes personal communication 2018). Overall, this work has revealed most ritual use occurred during the latter portion of the Late Classic period (AD 700-900), with

some evidence of early Postclassic period use, and that some activities were occurring just outside entrances (Moyes and Awe 2015, 2016, 2017).

From a broader regional perspective, cave investigations in the western Belize Valley, Vaca Plateau, and northern Chiquibul have also documented extensive ritual use dating primarily to the Late Classic period, although many were first used in the Preclassic period (Awe 1998; Colas et al. 2000; Colas et al. 2003; Colas et al. 2008; Griffith et al. 2000; Ishihara et al. 2001; Mirro 2006; Moyes 2006; Moyes et al. 2012; Reeder et al. 1998; Reeder et al. 1996). Moreover, many of these places were extensively modified and used for rain rituals (Moyes 2012; Moyes et al. 2009; Spenard 2014, 2017). For example, the mid-sized site of Las Cuevas in the Chiquibul Reserve is situated around a massive sinkhole cave opening (Moyes et al. 2012). Inside the cave, researchers have documented extensive architectural constructions, including terraces, retaining walls, and thickly plastered stairs and platforms (Moyes et al. 2012:225). On the Vaca Plateau, near the site of Minanha is Chechem Ha cave, which has the longest known record of use in all of Belize, dating back to the Pleistocene, but like many other caves in central Belize, it was used most regularly in the Classic period (Moyes 2006a, 2006b). The cavern is unusual in that it is located far from any known settlements suggesting it was a pilgrimage destination for local elites, and with its having been overlooked by, and protected from looters, the deposits remain largely intact (Moyes 2003, 2004, 2006a, 2006b). A common pattern of artifact distribution seen in the cave is large ollas with Mount Maloney Black bowls capping them. Moreover, ancient Maya appear to have modified one of the passages in the cave to transform it into a sweatbath (Moyes 2005).

It is important to note here that the Belize Valley has been the focus of intensive archaeological research for the past 70 years, resulting in one of the most comprehensively (pre-LiDAR) surveyed areas in Maya archaeology (Chase and Garber 2004). Those multitude of projects have documented continuous, intensive, dense settlement continuing into the rough terrain of the Vaca Plateau. Yet, as with the Mountain Pine Ridge/Rio Frio Region, the lower Macal river valley, the southern border of the MPR and RiFRAP permit area, has gone largely unstudied. Unfortunately, the region will remain poorly understood as the Challilo Dam, and its reservoir (Challilo Lake) have inundated the valley. Fortunately, prior to the construction of the dam, a salvage archaeology project was undertaken by the Belize Valley Archaeological Reconnaissance project, led by Jaime Awe and Douglas Weinberg. That project documented nearly 300 structures in the roughly 6 km-long impact zone. Included in those totals were four multiple plaza sites (totaling 58 structures), 11 large plazas (totaling 61 structures), 41 plazuela groups (totaling 127 structures), and an additional 56 isolated structures. In sum, this valley directly abutting the southern side of the RiFRAP permit area had a very high population density on par with the better-known Belize Valley (Awe et al. 2005:11). Although not part of Challilo impact survey, the site of Caledonia is just across the Macal River on the Vaca Plateau from the southwestern corner of the RiFRAP permit area. That site was occupied from the Late Preclassic through the Early Postclassic periods, had close cultural affiliations with the major center of Caracol to the south and the Belize Valley to the north, and people from there exploited the locally available granite resources (Awe 1985; Awe et al. 2005:6; Healy et al. 1998). Additionally, an unnamed and unexplored E-group plaza 0.5 km northwest of Caledonia and another public plaza group 3 km to the latter's west, both also on the Vaca Plateau, were identified during a LiDAR survey of west-central Belize (Chase et al. 2014: Figure 5). Although

these sites have yet to be investigated, their presence further supports the observation that this region of Belize was heavily populated during the Classic period. Moreover, like their counterparts in the Belize Valley and Caledonia, the people who lived there were likely extracting resources from the MPR.

## **Theoretical Overview of the RiFRAP**

Over the last few decades, landscape archaeology has revealed the world people live in is more than a passive backdrop upon which culture is enacted; instead, it was an active participant in the cultural making process (Knapp and Ashmore 1999). Such a worldview is particularly pertinent to the pre-Hispanic Maya who understood the world they inhabited to be alive, and imbued with animate, generative forces such as Earth spirits and ancestors (Astor-Aguilera 2009, 2010; Brady 2005; Spenard 2014). Among the core tenets of this understanding of the world is the ideational interconnectedness of mountains, caves, and water (Brady and Ashmore 1999). Simply put, every mountain was believed to have a cave in it, which provided access to water.

The ancient Maya considered mountains and hills to be more than simply inanimate landmarks with caves providing access to underground water; instead they were believed to be places of creation, community origins, and thought of as living, breathing entities (Taube 2001). Ethnographic research throughout the Maya area has enriched our understanding of these beings. On the one hand, they are often considered social agents who regularly communed with one another, they parented offspring, went to war with one another, built alliances, held council meetings, and often act as the patron saints for communities (Astor-Aguilera 2009, 2010; Schackt 1984). On the other hand, some mountains are powerful, ambivalent beings commonly referred to in ethnographic literature as the Earth Lord or Don Juan, local manifestations of the owner of earthly things and rain (Craig 1998; Cruz Guzman et al. 1980; Halperin et al. 2003; Montero-Lopez 2009). Although the specific traits of this being vary between communities, he is often described as a greedy, cave-dwelling non-human person who maintains corrals for wild animals in his mountain and issues rain and lightning from his subterranean home. Yet, he is an ambivalent force. On the one hand, he distributes wealth generously, but petitions to him are wrought with danger, as failure to perform the ceremonies properly, or sometimes simply without cause, he metes out punishment.

Another common belief about mountains and caves among contemporary Maya communities is that humanity originated in caves, and that each community or lineage within a site has a specific landmark considered as their emergence place. The antiquity of this belief can be seen in the Late Preclassic period murals from San Bartolo, Guatemala depicting the creation of the four-cornered world, followed by four ancestral couples emerging from and then taking out of a cave corn and water, the items of human subsistence (Saturno et al. 2005). In addition to being considered the origin places of humans, mountains and caves were vital components in foundation rituals for establishing of new communities, indicating the continued active role of the landscape in settlement configuration (Garcia-Zambrano 1994). In short, each new community needed to replicate the primordial landscape of creation, including having four corner mountains and one at the center. The central mountain needed to contain a cave with a spring to act as the mythological origin place, with the settlers excavating an artificial cavern if

one was absent. Landmarks surrounding the community such as prominent mountain tops, caves, hills, trees and water were marked with stone cairns and used as boundary markers. Each community undertook annual pilgrimages to their boundary landmarks to reinforce their territorial claims.

For the pre-Hispanic Maya in the southern Lowlands, caves and mountains were highly politicized locations of the landscaped. They were often used as the foundation for place names, and they came to be places tightly controlled by the elite during the Late Classic period (Spenard 2014; Stuart and Houston 1994:43-56). In some cases, this control was direct, such as the construction of royal places and other administrative buildings directly on top of cave entrances such as at Las Cuevas in Belize, and Dos Pilas in Guatemala (Brady 1997; Brady et al. 1997; Moyes 2012; Moyes et al. 2016; Moyes et al. 2017; Moyes et al. 2012; Moyes et al. 2015). In other instances, control was passive, such as the elaborate constructions made to Actun Lak at the end of the Classic period that forced audiences to stay outside while the ritual participants performed their tasks inside but within view (Spenard 2014).

Finally, recent archaeological research throughout the Maya area has revolved around understanding the pre-Hispanic Maya concept of *ch'een*, a term commonly glossed as “cave,” but that actually referred to any hole in the ground including caves, *cenotes*, *chultuns*, rockshelters, sinkholes, even bedrock outcrops and boulders with slight overhangs, all providing access to the Earth forces who live underground (Spenard 2014). Nevertheless, the collective focus of landscape archaeologists has been on those caves and rockshelters that are relatively large, even though evidence of ritual use of more diminutive features is regularly attested to by the presence of ceramic sherds and modifications commonly seen in a variety of small landmarks.

Besides the landmarks themselves, one common theme ties together our current understandings of pre-Hispanic Maya perceptions of their landscape, which is that most of the recent studies have been conducted on sites in close proximity to settlements. Yet, at least as far back as the Late Preclassic period, the Maya made long-distance pilgrimages over vast territories to landmarks, suggesting current understandings of Maya landmark use is incomplete (Brady 1989; Spenard 2006; Stone 1995).

## **RiFRAP Research Agenda**

Due to an overall lack of research in the study region, many basic questions about it remain. These questions shape the project's long-term research agenda.

- 1) What kind of sites are in the research area?
  - a. Are there settlements, if so, how did the people there make a living?
  - b. Are there quarries? If so who was using them? Are there affiliated permanent settlements or temporary work camps?
  - c. Are there other ritual landmarks such as caves, rockshelters, bedrock outcrops etc?
- 2) What is the culture history of the region, and does it vary by site?

- 3) What is the regional pattern of ritual cave use?
- 4) Were the karst landmarks in the study area used for rain, ancestral, or other rituals, and if so, how did use change overtime?
- 5) Why were the Rio Frio caves used, who were the people using them, and for what purpose(s)?
- 6) Were the people using the Rio Frio caves from a heretofore unknown local population, or were they pilgrims from other regions?
- 7) Who were the people constructing shrines and cairns in the Mountain Pine Ridge?
  - a. What were the functions of these constructions?
- 8) Given the diversity of shrines already known in the proposed research area, what other kinds of ritual shrines can be identified?
- 9) Where were the economically important resources (granite, slate, and pine) being harvested from,
- 10) Was there a ritual component of resource extraction?

### **2018 Season Specific Research Questions and Goals**

The proposed research area in the Rio Frio and adjacent Mountain Pine Ridge regions provides a rare opportunity to greatly expand our knowledge of Maya landmark use and Maya worldview. Because the study region is *terra incognita* as mentioned above, the primary aims for the 2018 field season were aimed at gaining a basic understanding of the study region, and the types of sites it includes. Our goals for the season included the following:

- 1) Relocate known archaeological sites in the region: Rio Frio Caves A-E, Bullard's Shrine, and Thompson's cairns.
- 2) Collect GPS coordinates for known sites and project boundaries
- 3) Conduct reconnaissance for new archaeological sites
- 4) Produce descriptions of relocated and new sites
- 5) Begin digitally surveying and mapping the known archaeological sites in the region
- 6) Comprehensively photograph archaeological features and architectural constructions in caves for creating three-dimensional digital models.
- 7) Collect in-situ ceramic data (rim profiles, rim diameters, types, and other drawings) for establishing a baseline regional chronology and cultural affiliation of site occupants. Photograph all ceramics described
- 8) Collect in-situ non-ceramic artifact data (drawings and descriptions). Photograph all non-ceramic artifacts described

### **Summary of Results for the 2018 Field Season**

Rio Frio Caves A, B, and C were successfully relocated. Caves D and E, as well as Bullard’s shrine and Thompson’s cairns were not<sup>1</sup>. Three cave sites new to archaeology were documented, although two, Tunel Cave, and Closing Jaw Cave had hand painted signs in front of them in the same style as Rio Frio Caves A–C (Rio Frio Cave, and Twin Caves) indicating these are known to others. Tunel and Closing Jaw caves are located just off the main road between the Douglas D’Silva Forest Station and Rio Frio Cave C. The third new cave is a sinkhole located about 100 m east of the Rio Frio Nature Trail 300 m above Rio Frio Cave A. In the Mountain Pine Ridge proper, two granite quarry sites were identified near the area of Bullard’s shrine. The quarries are about 75 m apart and smaller possible sites are located between and around them indicating a larger site might be present there. Several isolated tools and flakes were also documented in the area along Granite Cairn and Naval Roads, and at Pinol Sands. Some of the tools and flakes were found near granite outcroppings and resemble production tools found at the ground stone workshop at Pacbitun indicating they were likely used for the same purpose (Ward 2013). The tools and flakes away from the outcrops may be related to ancient lumberjack activity. Locational data for these sites is listed in **Table 2** below. Descriptions of all the listed cave sites are given by Mirro and Spenard in this volume, and artifact data is presented by Spenard in this volume. Many of our digital models and virtual tours are still being processed; however, those that are completed will be placed on file at the Belize Institute of Archaeology with the submission of this report.

**Table 2.** GPS coordinates for all archaeological sites documented during the 2018 field season.

Site	Easting	Northing	Comment
Rio Frio Cave A	All GPS coordinates on file at IOA		Also known as Twin Cave
Rio Frio Cave B			Also known as Twin Cave
Rio Frio Cave C-1			Also known as Rio Frio Cave; coordinate is for primary tourist entrance on the southwest.
Rio Frio Cave C-2			Also known as Rio Frio Cave; coordinate is for the secondary entrance on the northeast
Tunel Cave			Possibly Anderson’s (1962) Rio Frio Cave D
Closing Jaw Cave			
Sinkhole 001			
Granite quarry 001			
Granite quarry 002			

<sup>1</sup> Tunel Cave may be Anderson’s (1962) Cave D, but this relationship awaits further inquiry with the IOA site files next field season.

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## **Preliminary Site Descriptions**

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A major focus of field investigations of the 2018 season was an area west of Augustine in the Mountain Pine Ridge region of Belize. Another was a ridgetop around a granite outcrop near Bullard's (1963) shrine. The area west of Augustine contains several caves, one of which is a popular tourist destination, the "Rio Frio Cave" (Rio Frio Cave C), yet all have received limited study. Most notable studies occurred by Anderson (1962), Mason (1928, 1940), and Pendergast (1970) in the earlier and mid part of the 20<sup>th</sup> century.

The 2018 cave study area is located along the road to Rio Frio tourist Cave, (Mason's [1928] Rio Frio Cave C). The road generally runs northwest-southeast and is accessed from the southwest corner of Augustine. The underlying geology abruptly transitions from the Pine Ridge granites near Augustine to limestone hills westward, with granite dipping beneath. The Rio Frio drains the local region of the Pine Ridge immediately north flowing onto the limestone through Rio Frio Cave C and roughly 4.5 kilometers west into the Macal River. Mollejon Creek is 2 to 3 kilometers to the south of Rio Frio and Rio On is 2 kilometers to the north.

The limestone on the western side the Pine Ridge is an extension of the formation found on the Vaca Plateau (Pendergast 1970). It is divided from the plateau by the Macal River and consists of low remnant hills overlying granites of the Pine Ridge. The Rio Frio area is fluvio karst with dendritic drainage patterns contributing local flow to major creeks that carry runoff from the Pine Ridge into the Macal River. Hilltop surfaces consists of exposed bedrock that is highly jointed and shallowly fissured with numerous cockpits. Hills range in height from 70 to 100 meters above the valley floor.

Caves in the study area following along the Augustine-Rio Frio Cave Road are, Closing Jaw Cave, the "Twin Cave", Rio Frio Caves A and B, an unnamed pit cave (sinkhole 001), an unnamed, heavily karstified limestone outcrop (unnamed karst outcrop 001), Tunel Cave, and Rio Frio C (**Figure 1**). Closing Jaw, Rio Frio A, and the pit are within the same hill and appear to be part of a larger drainage system. Except for the pit cave, all are accessible by road and well-maintained path and are intermittently accessed as part of local tourism. The resulting effects have led to loss of artifacts, disturbance to features, compaction of cave sediments, crushing and breaking of artifacts, and damage to cave formations and features, especially graffiti. Nevertheless, initial investigations into these caves during the 2018 season has led to the discovery of numerous features and evidence of Maya cave use that will contribute to our knowledge of ritual use of caves with further scientific study.

### **Closing Jaw Cave**

Closing Jaw Cave (**Figure 2**) was only briefly entered and explored during the 2018 season. Its entrance is a 2 m long by 0.5 m high hole in the base of an exposed bedrock face in the hillside. The floor slopes downward quickly and the walls spread wide after a few meters into a large chamber. Our observations indicate the cave conforms to Miller's (1996) chamber stratum description in his morphological classification. Overall, the cavern consists of a single chamber estimated between 50 and 70 meters in depth with a rubble floor and with dense clusters

of large formations. Formation growth in the cave is extensive dividing the chamber into several rooms and short tunnels. Cave floors consist of open flat areas of clay separated by rubble consisting of ceiling collapse and fallen formations. Artifacts density in the cave is low, with a handful of isolated ceramic scatters and charcoal noted throughout the reconnoitered areas. Several features were observed including cobble walls and stone clusters. Patterning in the rocks and debris in the entrance suggest the possibility that the entrance was formerly walled.

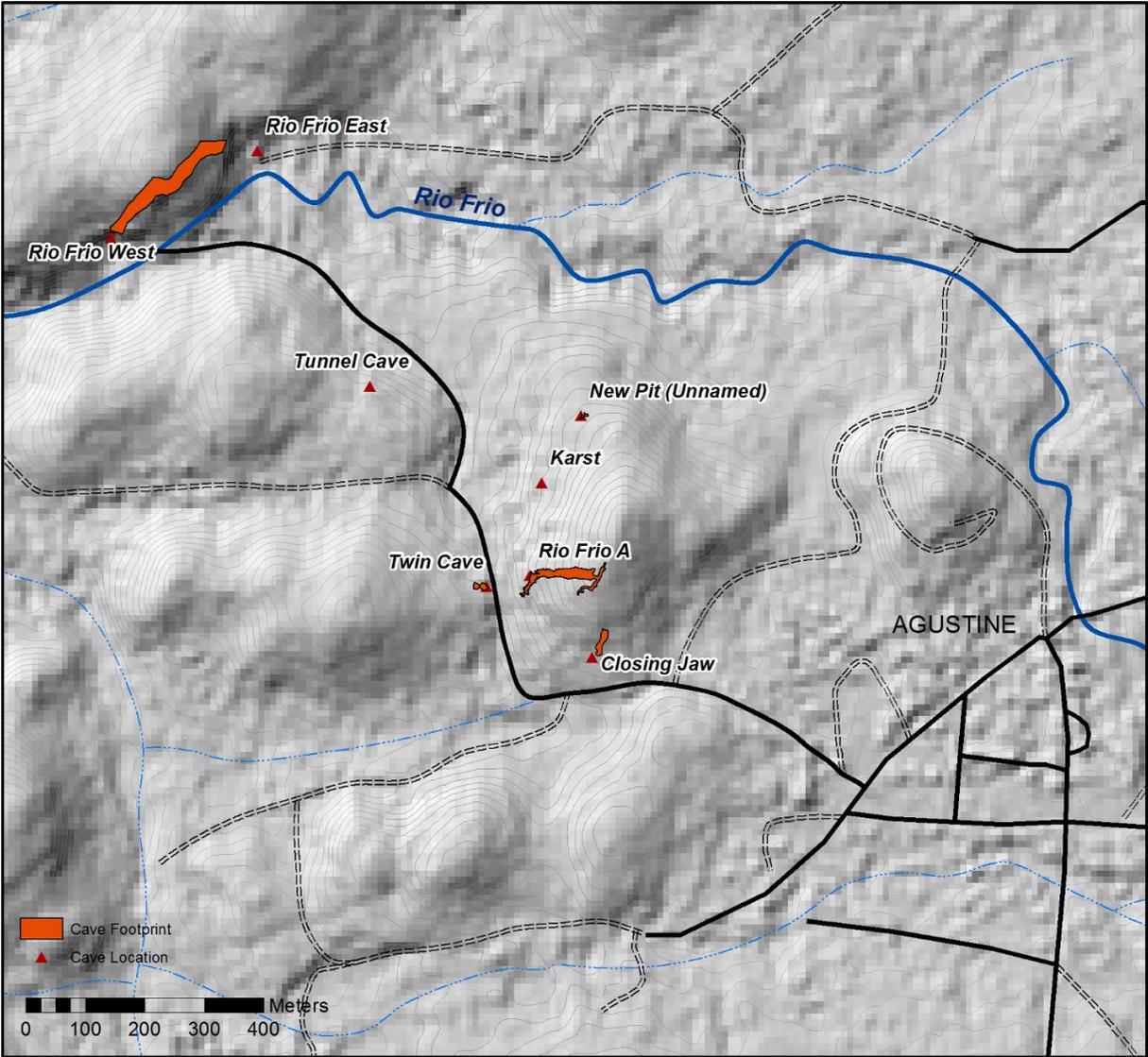


Figure 1. Location of caves in Rio Frio area (Map by M. Mirro).



**Figure 2.** Entrance to Closing Jaw Cave (photograph by M. Mirro).

**Rio Frio Cave B**

The lower of the “Twin Caves,” Rio Frio Cave B, is only a few meters west of the road between Augustine and Rio Frio Cave C (**Figures 3, 4**). It was only briefly explored during the 2018 field season, and our observations from that time suggest it should be classified as a chamber stratum cave in Miller’s (1996) typology. It has smaller dimensions than Closing Jaw being roughly 25 to 30 meters long and about 10 meters deep. The cave itself consists of two roughly circular chambers each approximately 10 meters in diameter. The front chamber, Chamber A, is spacious and well-lit by the gaping entrance providing ample sunlight. The rear chamber, Chamber B, is accessed by a large hole in the rear wall of Chamber A. The hole between the chambers is positioned in such a way that little light enters the rear room. Highly weathered formations abound within both chambers covering much of wall and ceiling surfaces, and the floor consists of rubble infilled with clay and debris. The cave is accessed by a relatively steep climb approximately 4 m down the east wall of Chamber A. The lip above and the entrance drop itself do not exhibit any signs of modification; however, constructed (partially collapsed) walls are present between the two chambers, indicating it was closed off in the past. Artifacts were not observed within this cave during our visit, although as discussed by Spenard in the first chapter of this volume, Mason (1928, 1940) reported finding many undecorated sherds in the cave as well as a spiked censer.



**Figure 3.** Rio Frio Cave B entrance (lower Twin Cave) seen from Augustine-Rio Frio Cave Road (photograph by J. Spenard).



**Figure 4.** Rio Frio Cave B looking east from juncture of the two chambers. Note the large drop from the forest to cave floor (Photograph by M. Mirro).

### **Rio Frio Cave A**

The primary focus of the 2018 season was Rio Frio Cave A, the upper of the “Twin Caves.” Our efforts in this cave were threefold and include starting a comprehensive map, describing locations of archaeological significance, and recording artifact data. The map is presented below in **Figure 5**, while artifact data are presented in this volume by Spenard. In this chapter, we provided an updated description with a more contemporary understanding of geology and pre-Hispanic Maya cave use to Mason’s (1928, 1940) relatively accurate and detailed description. **Table 1** contains descriptions of what the project refers to as “locations.” We use this term to refer to any spot in the cave containing something of archaeological interest. It can refer to areas of harvested formations on the ceiling, artifact scatters, architectural constructions, ash deposits, etc. Each location is plotted on area specific maps within the cave. The area specific maps are still in preparation but will appear in future progress reports.

Four areas make up Rio Frio Cave A, three of which Mason (1928) previously identified. They are, a rockshelter entrance off of which three passages branch, one to the southwest, another to the northeast, and the fourth, identified during the field season, to the north. The

rockshelter portion of the cave, called here Chamber 1 (Entrance Chamber), runs roughly north-south (28°), opens to the north west, is 3 m deep by 10 m long, and has a variable ceiling height

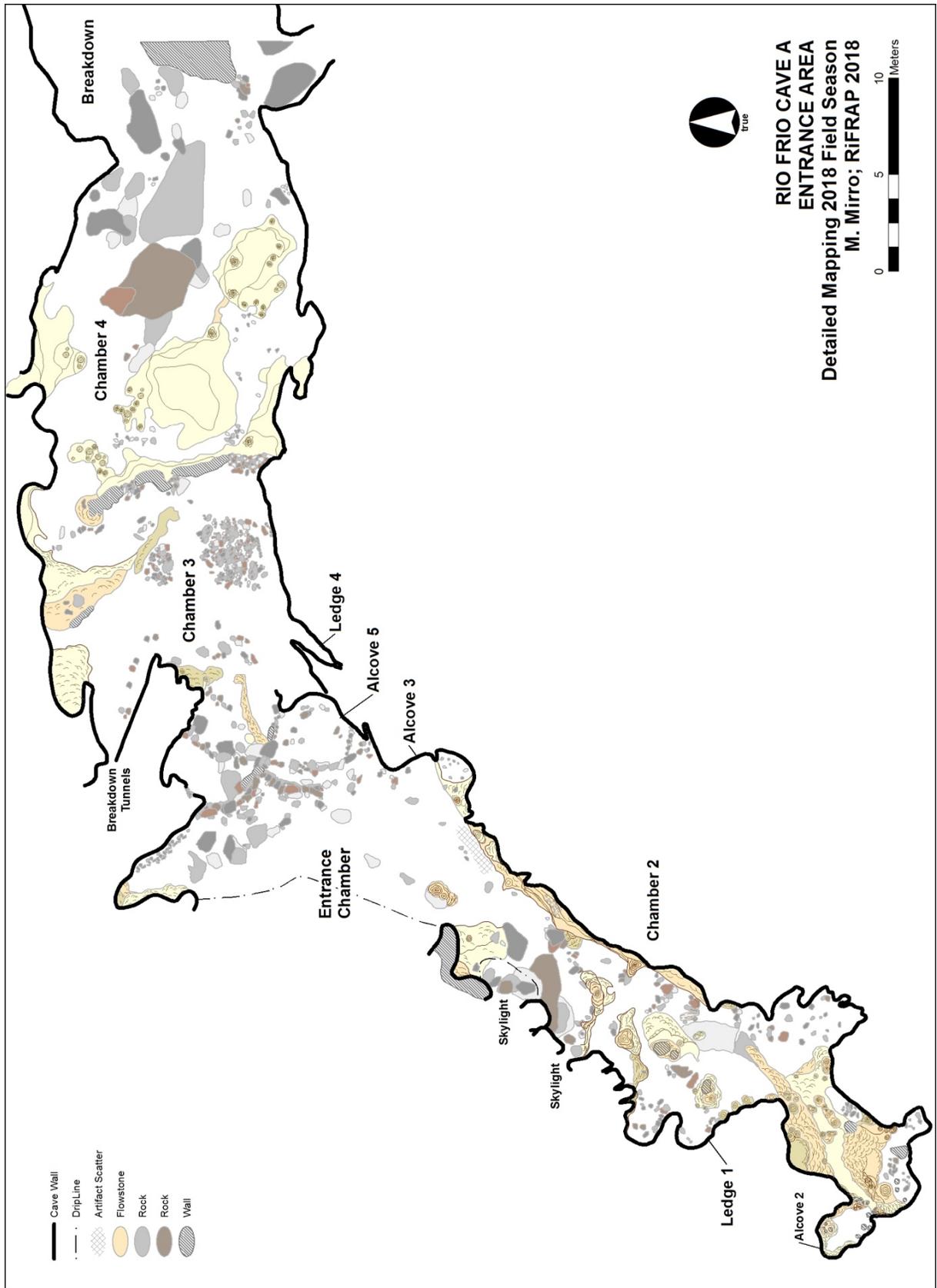


Figure 5. In-progress plan view map of Rio Frio Cave A (Map by M. Mirro).

of 0.5 m to 4 m. There are two main entrances to the north and south separated by a natural talus/debris pile fallen from the cliff face above. Currently, the easiest access is on the north side with an unrestricted opening and where the forest floor drops 2.5 m to the floor of the rock shelter at the cave's dripline (**Figure 6**). The southern entrance is largely inaccessible due to tree fall and forest overgrowth (**Figure 7**). Ceramic sherds are found throughout the entire space, but a heavy concentration is present along the eastern side of an alcove in the center rear of the feature. Several crude architectural alignments are also present.

Extending 16 m to the south-southwest of Chamber 1 is Chamber 2, the smaller of the two cave-like passages described by Mason (1928, 1940). The chamber is 28 m long and trends downward along a series of natural terraces in the floor. Seemingly in an effort to facilitate travel through this part of the cave the pre-Hispanic Maya constructed a series of step-like walled terraces across the first half of the chamber's floor. The west side of the chamber is dominated by Ledge 1, which is naturally separated from the rest of the cavern by a series of stalagmitic columns. A low density ceramic scatter blankets the ledge and several crude architectural constructions are found in its alcoves. Broken stalagmite and stalactites evidence extensive formation mining in the area. Some ceramics and other subtle modifications were noted in the lower half of the chamber, but most activity appears to have focused on Ledge 1 and the passage in front of it.

The bulk of Rio Frio Cave A is a large, multi-room chamber stratum cavern oriented east-west between 110 meters in length. Chamber 3, the westernmost part of this area, is entered by passing behind an artificial wall of large limestone blocks, restricting the entrance to a 1 square opening. Mason (1929:12) proposed the wall served defensive purposes for people living within, and to protect them from rocks rolling in. Considering we now know pre-Hispanic Maya people did not live in caves, the wall must have served another purpose. Rather than defensive, it appears to have been multifunctional. Access to Chamber 3 can only be achieved by following the path created by the wall. Yet, it is also sufficiently tall that it blocks a significant amount of daylight from entering the cave. In fact, several of the architectural features in the cave appear to serve that same purpose, limiting and perhaps even omitting completely any sunlight from entering the lower chambers.

Due to the complexity of this part of the cave, only the first two rooms, Chambers 3 and 4, were mapped and descriptions of locations of archaeological interest made. Due to the high ceilings, extensive floor space, and general openness of the room, Mason (1928:12) referred to Chamber 4 as, "The Cathedral." These two chambers are infilled with significant quantities of sediment between speleothems and rubble, and this section of the cave is easily explorable consisting of sloping clay floors and small boulders. Ceramic and non-ceramic artifact scatters, ash lenses, architectural constructions were identified throughout these areas.

Although our efforts focused largely on Chambers 3 and 4, a brief reconnaissance to the rear of the cave was made from which we make several preliminary observations. Firstly, Mason (1928:12) reports encountering a large stalagmitic column on a ledge overlooking Chamber 4 from which several pieces had been removed in antiquity, creating a serpent-like visage. We easily relocated this column and reexamined the broken pieces. Although it has obviously suffered greatly from modern graffiti and machete chopping, many broken areas in the "mouth"

show signs of regrowth, demonstrating their antiquity (**Figure 8**). More surprisingly, when lit for photographing, we noted the modified portion of the column projected a shadow of a fierce visage against a wall easily visible from Chamber 4 below (**Figure 9**). We also observed that the area of the cave beyond Chamber 4 has been heavily damaged by modern graffiti (**Figure 10**).

**Table 1.** Location descriptions. Numbering began at 100. Time did not permit collecting descriptions for all location numbers. Those without descriptions from the 2018 will be revisited in later field seasons, and this table updated in future progress reports.

Location #	Description
100	A large ceramic scatter 4 m wide by 2 m long concentrated against the southeast wall of the rockshelter entrance to the cave. Most of the sherds are unslipped body fragments, but a few diagnostic pieces were noted. The ceiling above the scatter is 2.5-3 m above the cave floor. The wall above the scatter is irregularly shaped flowstone, and a low ledge about 1 m deep juts out over the scatter. Charcoal is visible throughout the scatter suggesting the area was used for burning.
101	An alignment in Alcove 3 of small to medium limestone rocks ~ 1 m east of Location 100. The stones run north-south across the entrance of the alcove. The alignment runs 1.8 m along the north-south axis, ranges in width from 1m to 0.65 m, with the larger area abutting the cave wall. The ceiling height in this location ranges from 1 to 2 m tall.
102	Just east of Location 137 and in the northeast section of the Entrance Chamber is the large stone wall described by Mason (1928). This wall largely blocks entry into Chamber 3, forcing one to enter via a small alleyway on the cave side of it. The wall is 4 m long and ranges in height from 1.2 to 2.3 m tall. The ceiling above the wall is low, about 1.2 m tall, forcing one to duck down as they pass through the alley adjacent to the wall. Construction materials consist of large, angular boulders, possibly cut and small stones inserted into the gaps. The largest boulder is over 1 m long by 0.5 m tall. The size of this boulder suggests it weighs several hundred kilograms. The north end of the wall intersects at a 90-degree angle with another wall, Location 118, creating an L-shaped wall complex.
103	Not described
104	This feature is a wall situated between a naturally occurring bedrock wall on the east and a naturally formed ledge on the west. The wall is 9.5 m from the cave entrance on a 40-degree slope on the south aspect. The platform area on top of the wall shows signs of mild erosion with scattered vegetation debris and small cobbles that have slid down from normal erosional processes. It is adjacent to a natural L-shaped formation on the east side. The wall consists of several small boulders and various sized cobbles. There are a few, non-diagnostic sherds visible on the surface.
105	This feature is a wall situated between a naturally occurring bedrock wall on the east and a naturally formed ledge on the west. The wall is 12 m from the cave entrance on a 40-degree slope on the south aspect. The platform area on top of the wall shows signs of mild erosion with scattered vegetation debris and small cobbles that have slid down from normal erosional processes. The wall consists of several medium boulders and various sized cobbles. No artifacts were noted on or around the wall.
106	This feature is a stone alignment on the west side of Ledge 1. The southern edge of the feature is 2 m aligned east-west, and the eastern edge is 2.5 m aligned north-south. The rock alignment is placed in front of a naturally formed alcove in the western wall of Ledge 1. The alcove is 2 m wide and 3 m deep. The back wall of the alcove contains another smaller one, 1 m wide by 1.5 m high. The ledge has a mud floor with minimal signs of erosion. The ledge is surrounded on the south and west sides by a cave formation. Ceiling height above the feature is 2 m. Several small non-diagnostic sherds are visible on the surface throughout the floor of the ledge. This feature is immediately adjacent to Locations 107 and 108.
107	A cluster of speleothem fragments on the southwest end of Ledge 1. Cobbles of variable size are scattered around the largest of the formations, and a low-density sherd scatter is found throughout and around the cluster. The feature lies adjacent to a naturally formed wall running along the south end of the ledge. The ceiling height is 1.5 m and is filled with stalactites that have been purposefully snapped off. This feature is in the immediate vicinity of Locations 106 and 108.

108	A tabular stone block placed between two stalagmitic columns on Ledge 1. The feature measures 1.5 m north-south, 1 m east-west, and 10 cm tall. The ceiling is 3 m directly above the feature, and it is filled with stalactites that have been purposefully snapped off in the past. Several small non-diagnostic sherds are visible on the surface around the stones and throughout the floor of the ledge. The feature is immediately adjacent to Locations 106 and 107.
109	This feature is a wall situated between a naturally occurring bedrock wall on the east and a naturally formed ledge on the west. The wall is 14 m from the cave entrance, and on a 40-degree slope on the south aspect. The platform area on top of the wall shows signs of mild erosion with scattered vegetation debris and small cobbles that have slid down from normal erosional processes. The wall consists of several medium boulders and various sized cobbles. No artifacts were noted on or around the wall.
110	Not described
111	Not described
112	Not described
113	Not described
114	Not described
115	Not described
116	Not described
117	A short stone wall 5.2 m long and varying in height from 1 m to 0.2 m from the floor of the alcove to the east. It is 0.75 m from the wall of Location 102 and runs from just before the Chamber 3 entrance to the center of the back wall of the cave. The southern portion of the wall has fallen into the alcove. The ceiling varies in height from 1.2 to 1 m above the wall. This wall serves to hold in fill that makes up the path to Chamber 3, and it delineates the platform in Alcove 5 from the path.
118	Not described
119	<p>This is a platform just under the entrance to Chamber 3. The platform was created by the construction of two retaining walls, and the area within filled with soil and rocks. The alcove is just north of the path leading down in to Chamber 3. The floor of the platform is littered with approximately 20 small to medium-sized stones that may be collapse from the wall in Location 118. The floor slopes slightly from the southwest to the northeast at approximately a 15-degree angle.</p> <p>The main retaining wall of this feature runs north-south and measures 2 m wide by 1 m high. It is composed of medium to large stones stacked directly above lower courses. A smaller wall runs east-west, is 1.3 m long, and is 0.4 m above the platform. These two walls form the southern and eastern walls of the platform, while the other walls are formed by the cave wall.</p> <p>The main wall is curved and faceted, having been formed by an aggregate of formations at the transition between the ceiling and the wall of the cave. Roughly 1.5 m above the platform surface is a natural hollow in the flowstone forming a niche in the wall. The front of this ledge measures 1.5 m wide and narrows down to 1 m at the back. The niche is 1 m deep. The surface of the ledge is irregular and slightly curved, and does not appear to have been altered.</p> <p>A curtain of stalactites forms a canopy over the platform. This curtain runs east-west and forms the majority of the ceiling above the platform. It is 1.8 m above the floor at its southern edge and curves upwards to 2.4 m at the northern end. The southwest corner of the platform lies outside this curtain, and the ceiling is 3 m above it. Many of the stalactites in this formation have been purposefully broken off.</p>
120	Not described
121	Not described
122	Ledge 4. An opening in 2.7 m high in the south wall of Chamber 3. It is formed within the formation of the south wall. There are over 100 bulbous stalactites in the ceiling along with soda straws. About 20% of them are broken. The floor is sloping flowstone with 40-50 small stalagmites. The opening is triangular and is 0.8 m high and 1.15 m wide. Orientation of the ledge is 230 degrees. There is a small alignment of rocks and formation fragments 1 m from the entrance. It consists of ~8 rocks. Associated with it are 15-20 jar body sherds. They are black, unslipped, and

	<p>heavily burned. One is red slipped. The stone alignment retains a small amount of organic material (probably guan). There are also a red slipped body sherd and a black unslipped body sherd on the floor.</p> <p>About 0.5 m from that feature is a small niche in the cave wall into which a single jar body sherd and large cobble were placed.</p> <p>At the far end of the tunnel is an opening 0.33 m wide, 0.15 high, and 0.7 m deep. It has been partially blocked by 5 large cobbles. No artifacts were noted with this wall.</p> <p>There is a small side tunnel within the ledge that goes up. This tunnel leads to a chamber, called Ledge 3, which overlooks Chamber 3. The chamber is 2 m long at an orientation of 310-degrees, and is 0.8 m at its widest. The part of the chamber that opens up to the room is 0.8 m wide by 0.6 m high. Stalagmites and stalactites from a maw a maw at the opening. The stalagmites along the base have ~ 20 stones placed between them, forming a wall. This wall retains the clay floor, making a platform. The platform is 1.3 m by 0.6 m. The floor of the platform has a 0.7 m by 0.3 m flat, tabular chunk of flowstone on the SE side. The hole leading down to Chamber 3 on the east side is blocked by a small boulder. One spire loped <i>jute</i> snail shell, 4.8 cm long by 2.3 cm in diameter, was spotted near on the surface. The only other artifact is a single, unslipped body sherd.</p>
123	<p>This is a collapsed wall that was used to block off a natural window in the cave wall in the east-southeast corner of Chamber 3. The window is 2.5 m high by 2 m wide, and it overlooks Chamber 4. The ceiling height here is approximately 3 m tall and there are a few stalactite formations in its general vicinity. The blockage was formed by at least 12 boulders and several small to medium sized cobbles. The rocks used to create the blockage were knocked down sometime in the past, likely the result of human agency, and now lie at the base of the opening. The lower half of the opening remains blocked. The boulders and cobble that make up the upper half of the blockage are strewn into Chamber 3. The length of the rock pile extends from 3 m west of the wall opening and the width is roughly equal to the opening at 2 m. At the base of the feature is a sherd cluster with over 30 sherds. There are a few diagnostic pieces with majority being unslipped. A secondary sherd cluster lies 3 m west of the wall opening. That cluster has at least 20 sherds, most of which are non-diagnostic, though a few diagnostic jar rim fragments were present. There are a few nondiagnostic sherds located throughout the debris pile.</p>
124	<p>A collapsed limestone rock wall used to block off a natural window in the cave wall separating Chambers 3 and 4. This location is in the southeast corner of Chamber 3. The window measures 1 m high by 0.5 m wide. The ceiling height at the location is 3 m tall and there are a few cave formations hanging from it in the general vicinity. The constructed wall was built with one large boulder, five medium-sized boulders, and several small to medium cobbles. The construction was knocked down sometime in the past, likely by human agency, and now lie in a pile on the floor of Chamber 3. The resultant rock pile extends to 2.5 m west of the window and 2 m out from it. One m south of the window is a small naturally formed ledge upon which was placed a single unslipped ceramic body sherd.</p>
125	<p>An ash, charcoal, and <i>jute</i> river snail shell deposit in Chamber 3 at the base of a flowstone column adjacent to the north wall and above the drop at the east of the chamber. The column has a natural window looking northeast into Chamber 4. Above the feature there are dripstone formations. The ash deposit is 2.5 m northwest-southeast, and 1 m from the formation. There is a dense concentration of ceramic sherds visible on the surface. Most are undiagnostic, unslipped, plainware; although two diagnostic sherds were noted. One is a yellow-slipped jar rim, possibly Aguila Orange type, and the other a possible Mt. Maloney Black jar rim.</p>
126	Not described
127	Not described
128	Not described
129	<p>An artificial limestone cobble blockage of a secondary passage into Alcove 4. It is on the pathway along the eastern wall from Chamber 3 into Chamber 4 and is 3 m southwest of the downslope to that latter room. Above the feature are dry curtain formations hanging down from the 5 m tall</p>

	ceiling. The passage is a natural opening 0.6 m wide by 0.5 m high. The blockage is 2 m wide by 1 m long and made of medium-sized cobbles. No artifacts are visible on the surface of the blockage.
130	A collapsed wall blocking off a passage in the southeast corner of Chamber 4 that provided access to the Labyrinth (not surveyed this field season). The wall was made from medium to large limestone rocks with smaller ones used to fill spaces in between. The passage the wall blocked is 1.8 m wide by 1.2 m tall. The southern portion of the wall has collapsed, likely as a result of human agency, and its remnants lie across the artificially leveled floor (Location 132) beneath the passage. The rest of the blockage remains intact. This arrangement leaves an opening of slightly less than 1 m to pass into the Labryinth area. The floor beneath the entrance slopes downward at 20 degrees away from the blockage.
131	A retaining wall used to hold the floor fill in front of Location 130. The ceiling is roughly 10 m above the cave floor here. The eastern portion of the wall is clearly visible, but there may be another portion that runs westward that may be cultural. It is difficult to see whether the other portion was constructed because it is largely covered in mud. There is also another raised, flattened area to the east of 130 that may be partially held in by the eastern portion of this wall. The visible portion of wall is composed of medium to small stones piled to fill in space to the east side of a large boulder protruding from the floor of the cave. The western, less clearly visible portion appears to be composed of small to medium sized stones with dirt between them (making it possible that it is merely an exposed portion of floor composed of rubble and dirt that has been exposed due to the slope.). The cave floor slopes downward at a roughly 45-degree angle southward below this wall.
132	A retaining wall built to flatten and hold in fill in the elevated portion at the southeastern corner of Chamber 4. The wall is L-shaped and juts up 20 cm from the floor. The ceiling is 2.5 m above the flattened area and then slopes upward at a 45-degree angle toward the center of the chamber. The wall runs 1.7 m northeast-southwest from a large boulder before turning southwestward and running 1.8 m to the south wall of Chamber 4. The cave floor slopes downward and generally westward at a 20 degree angle.
133	A retaining wall at the base of the natural path between Chambers 3 and Chamber 4. Three-and-a-half meters above it are more dry curtain formations exhibiting heavy breakage due to human agency. The construction is aligned northwest-southwest following the same trajectory as the formation wall separating Chambers 2 and 3. It spans 4 meters wide, and adjacent to a naturally formed semicircular pit 1 meter in depth, and 1 meter in width at its open end. The wall has been partially covered by mud, and several small non-diagnostic sherds are in its proximity.
134	Not described
135	A constructed platform adjacent to the south wall of Chamber 3 and facing a natural widow in the cave wall 6 m to the east. The ceiling is 4 m above, and from it hangs a large stalagmitic formation. The platform is the easternmost terminus point of Ledge 4. The retaining wall of the northeast corner of the platform includes an in situ column. The surface of the platform slopes 20 degrees downward toward the northeast column. Non-diagnostic ceramic sherds of various size are scattered throughout the platform. A small, rusted metal bucket was also noted at this location.
136	A small natural opening in the flowstone wall at floor level. It is 0.33 m high by 0.4 m wide, and in the southern corner of Chamber 4. Approximately 1.2 m past the opening is a series of medium sized rocks, deliberately placed to block off the passage. No other evidence of human activity was noted in this location.
137	A possible rock wall on the north side of the Entrance Chamber adjoining the walls at Locations 102 and 118. Smaller stones were laid between larger boulders.
138	A small stone wall on the southern corner of Alcove 5. It is aligned northwest-southeast and intersects the wall in Location 117. It is 0.3 m tall, meeting the level of the Alcove 5 platform. The ceiling is between 0.5 m to 0.8 m above the wall. It is composed of medium sized cobbles coarsely laid in a line. The wall serves to hold fill used to make the platform in Alcove 5.
139	A retaining wall built to hold fill on the floor of Alcove 5. It runs east-west and is composed of various sized cobbles laid in a straight line in front of a bulbous formation emerging from the ceiling in Chamber 3. The eastern corner is a large boulder 1 m long. One m west of the boulder is an entrance to Ledge 2.

From a general perspective, the area of the cave beyond Chamber consists of open space 10 to 20 meters high with a moderate density of large speleothems over large blocks of collapse. Breakdown blocks range in size from 5 to 20 meters in size and is loosely packed containing open space explorable for 15 to 30 meters down. Numerous stone features and a low density of artifacts were observed between boulders. The spaces inside the breakdown was not explored; however, it is suspected this area was utilized by the ancient Maya and that many small chambers are present. The easternmost part of the chamber slopes steeply down about 20 meters to a conduit carrying a small stream (possibly surface influenced) oriented roughly northeast-southwest. This tunnel was explored 20 meters northeast and 45 meters southwest before it was choked out by speleothems sumping the creek. Chamber 1 and 2 show a similar orientation to the conduit indicating cave formation in is joint controlled. Moderately dense weathered speleothems fill the chamber creating ledges and small alcoves. The rubble floor and exposed bedrock on the walls is nearly entirely obscured by flowstones.



**Figure 6.** Rio Frio Cave A rockshelter north entrance. Project member, Joel Aspeytia included for scale and to demonstrate height of drop into rockshelter from forest floor (photo by J. Spenard).



**Figure 7.** Rio Frio Cave A rockshelter south entrance. Notice field packs leaning against rock for scale (Photo by J. Spenard).



**Figure 8.** Close up photograph of modified column formation on ledge overlooking Rio Frio Cave A Chamber 4. Note modern machete chopping on third column from right, and above the “mouth” (Photo by M. Mirro).



**Figure 9.** Photograph of shadow projected on cave wall from modified column on ledge overlooking Rio Frio Cave A Chamber 4 (Photo by M. Mirro).



**Figure 10.** Example of extensive modern graffiti damage common in Rio Frio Cave A (photo mosaic by J. Spenard).

### **Tunel Cave**

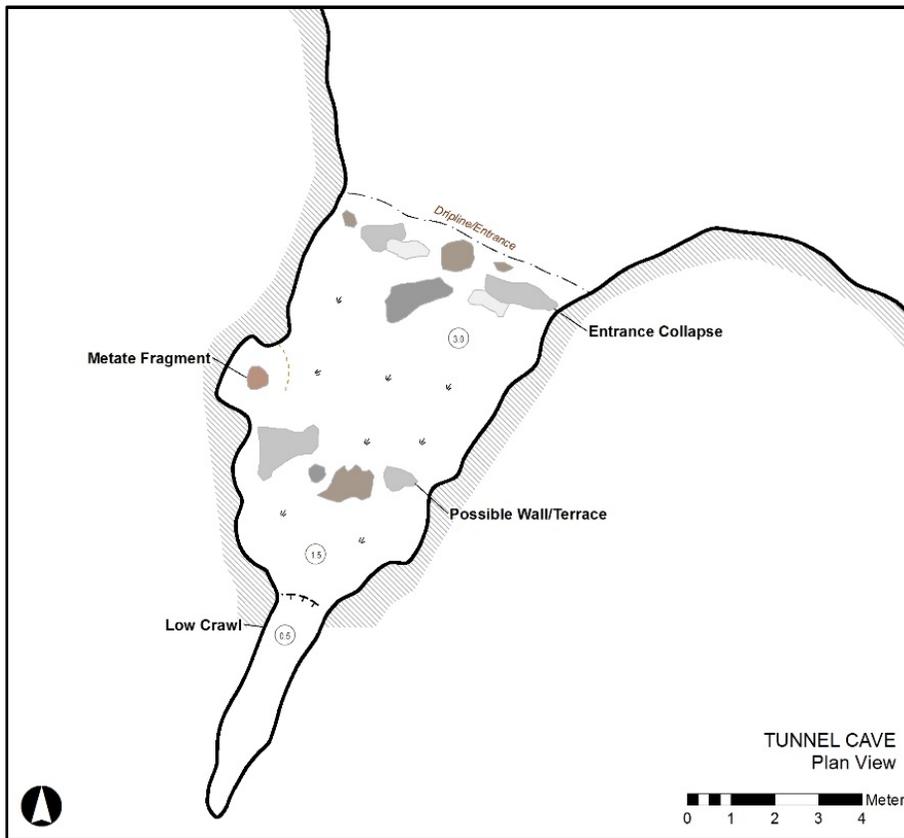
This cave is an isolated phreatic cave located near the hilltop west of the road to Rio Frio C (**Figure 11**). Its name comes from a sign posted at the foot of the trail leading from the Rio Frio Cave-Augustine road to the cave. Overall, this is a small cavern about 14 meters deep and no more than 6 meters wide (**Figure 12**). The entrance is about 3 to 4 meters high with the rear of the cave tapering down to a 50-centimeter-high by 1-meter wide crawl. A single course of collapse rubble is present in the entrance. The floor generally consists of coarse sediment and organic debris, although a rough line stones in the central part of the indicates the possibility of terracing or a low wall. Adjacent to the wall is a granitic metate fragment, one of the few remaining artifacts noted in the cave.

### **Rio Frio Cave C**

Popularly known in the tourist industry as Rio Frio Cave, Rio Frio Cave C is the largest known cavern in the study area (**Figure 13**). It consists of a single trunk conduit taking the entire flow of Rio Frio underground through a limestone hill. The cave is roughly 240 meters in length from insurgence to resurgence and measures over 40 to 50 meters wide by 30 meters in height (**Figure 14**). Large flowstone formations fill portions of the tunnel and the cave floor is granite. The cave is highly trafficked by tours and much of the interior appears to have been modified to accommodate visitors. However, several side passages were explored during the 2018 season and small stone features and ceramics were observed, although few in number. Although the artifact density was low at the time of our studies, Mason's (1928, 1940) work there suggests it was much higher than it is today.



**Figure 11.** Entrance to Tunnel Cave (photograph by M. Mirro).



**Figure 12.** Plan view sketch map of Tunel Cave (Survey and map by M. Mirro).



**Figure 13.** RiFRAP team for scale peering into Rio Frio Cave C. From left to right are Mike Mirro, Jonathan J Dubois, Joel Aspeytia, and Jon Spenard (Photo by J. Spenard).



**Figure 14.** Standing on the seasonal beach inside Rio Frio Cave C demonstrating the cave's interior size (Photo by M. Mirro).

### **Sinkhole 001**

This small, unnamed pit was observed in an area of bare rock nearly 250 meters north of the Rio Frio A. It is entered by way of 15-meter drop into a clay floored chamber roughly 10 meters in diameter with a small side alcove and several smaller chambers. Phreatic tunnels were explored in the upper part of the chamber. Several sherds comprising a whole olla were observed in the main chamber and several isolated sherds were identified in the alcove. Small stone features and walls were observed along the walls of the chamber.

### **Unnamed Karst Outcrop 001**

North of Rio Frio A and Sinkhole 001 is a highly jointed and slightly fissured karst outcrop along the trail to the small pit. Several small rock shelters and cockpits karst formations were observed within the formation that may show evidence of modification by the Maya. Potential modification includes small walls or platforms constructed from unshaped, dry-laid limestone cobbles.

## Quarry Sites

Due to time constraints, only a few hours of the season could be dedicated to reconnaissance for granite quarries. Our primary aim was relocating Bullard's shrine, which we were unable to accomplish, but we encountered a tall, human-shaped granitic outcrop that was reminiscent of the one he describes (**Figure 15**; Bullard 1963). Thinking we had relocated the shrine, we walked survey transects along the ridgetop around the outcrop, during which we encountered the quarries. Because so little time was spent locating the quarries, little can be said about them at this time except to note that they were found on low-lying bedrock exposures. We identified them based on the presence of hundreds of large granite spalls piled on top of and found around the outcrops (**Figure 16**). The spalls are reminiscent of those found at the groundstone workshop at Pacbitun (Ward 2013), suggesting those we located at the shrine are production waste.



**Figure 15.** Anthropomorphic granite outcrop near which the two bedrock quarry sites were identified (photo by J. Spenard).



**Figure 16.** Photograph of Granite quarry 001 in the Mountain Pine ridge (photo by J. Spenard).

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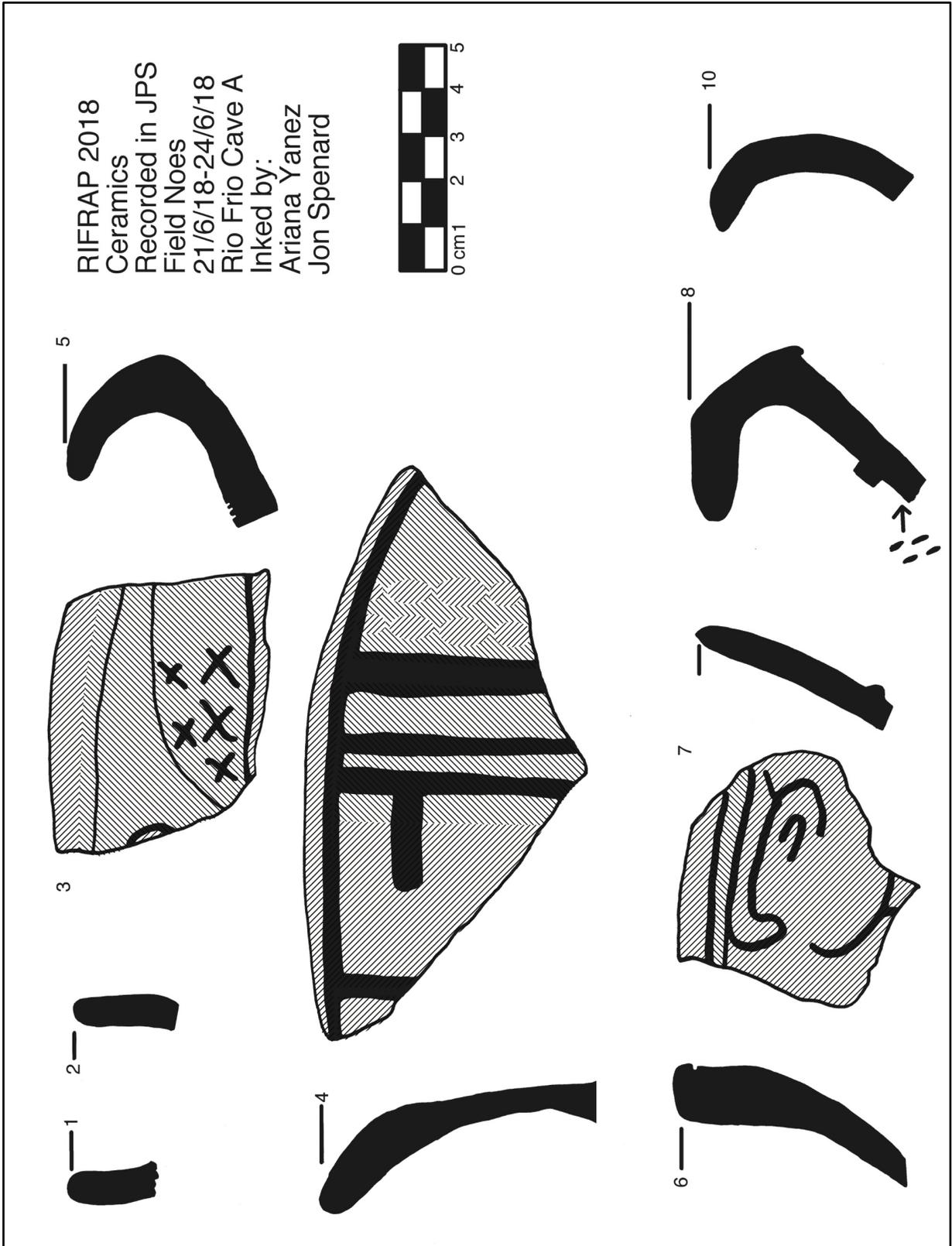
## Rio Frio Cave A Artifacts

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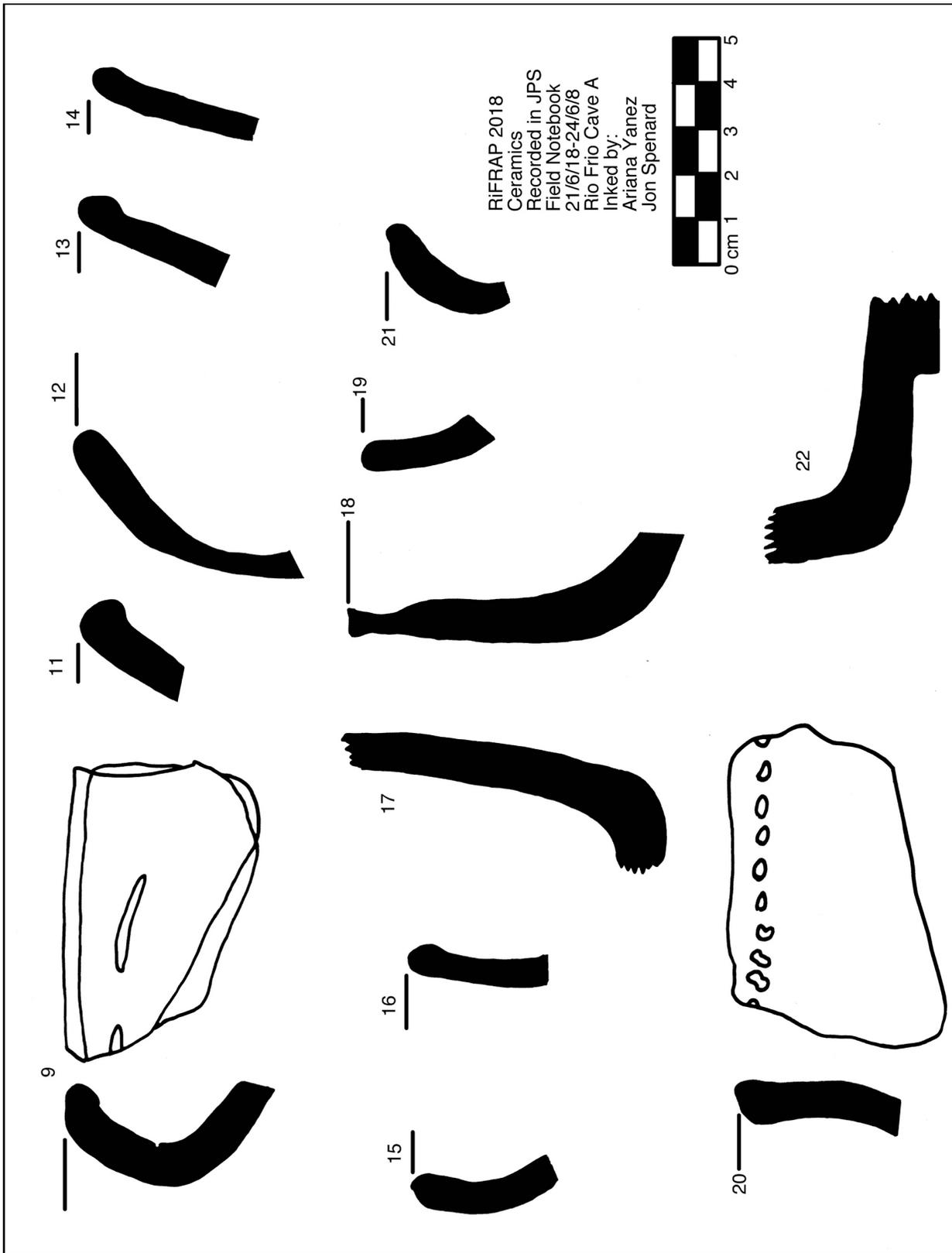
This chapter presents the results of the *in situ* artifact recording activities performed during the 2018 field season in Rio Frio Cave A. Drawings and photographs of isolated tools, and those from the granite workshops and were not made due to technical failure, but will be presented in future progress reports. The purpose of this chapter is presenting on the range of ceramic and non-ceramic artifacts recorded from the cavern during the field season to begin establishing a chronology and pattern of cave use in the region.

The method employed for this activity consisted of a systematic visual survey of Rio Frio Cave A Chambers 1-4 for diagnostic ceramic sherds and other non-ceramic artifacts. When ceramics were encountered, full scale rim profiles were drawn directly into field notebooks, and the exterior diameter of the rim was traced. For polychrome or other decorated sherds, drawings of the decorated faces were also made. Each sherd was then given a unique field id number and photographs made of its interior and exterior surfaces and its profile. The drawings were then retraced onto vellum, rim diameters calculated using a vessel diameter chart, scanned, and then digitized. Ceramic rim profiles and drawings of diagnostic components of sherds are presented in **Figures 1 and 2**, after which the individual sherds are described. The number in each figure corresponds to the unique field id number from my notebook. In the text below, each sherd number is listed, and described with provenience and other significant information including vessel rim diameter (when appropriate), vessel type (following Sabloff 1972:22-27), Munsell colors of slips (when time permitted making them), and brief comments about each. A “?” next to an entry indicates a less than certain identification. Because the ceramics from this region have never been formally described, type names are only given when they can be securely identified. At least one photograph of a diagnostic element (interior, exterior, or profile) from each sherd is also included when available, although no figure numbers are given for them.





**Figure 1.** Rim profiles and drawings of diagnostic components of sherds 1-8 and 10.



**Figure 2.** Rim profiles and drawings of diagnostic components of sherd 9, and 11-22.  
**Preliminary Descriptions of Ceramic Artifacts**

**Sherd 1**

*Provenience:* Location #100

*Type:* Indeterminate

*Vessel form:* Rounded bowl

*Rim diameter:* 21 cm

*Slip color:* exterior 10YR 4/6; interior 5YR 4/4

*Comment:* Dark yellow slipped exterior with reddish orange interior. The yellow slip continues to cover the entire lip of the sherd.



**Sherd 2**

*Provenience:* Location #100

*Type:* Indeterminate

*Vessel form:* Rounded bowl

*Rim diameter:* 23 cm

*Slip color:* 2.5Y 7/2

*Comment:* Sherd is covered in calcite, indicating it spent some time elsewhere beyond this sherd scatter, near a source of dripping cave water. The interior of the sherd is heavily burned.



### **Sherd 3**

*Provenience:* Found in top of collapsed terrace area in Chamber 3 near iron bucket.

*Type:* *Saxche-Palmar Orange Polychrome*

*Vessel form:* plate/dish

*Slip color:* 2.5Y 7/2

*Comment:* Exterior is unslipped, while interior is polychrome slipped. This is a Late Classic period form, likely a plate or dish, belonging to Peten Gloss ware.



### **Sherd 4**

*Provenience:* Location 120

*Type:* *Dos Arroyos Orange Polychrome*

*Vessel form:* possible basal flanged plate/dish

*Comment:* The polychrome decoration is on the exterior of the vessel, record of the treatment of the interior of the vessel was not made. The exterior vessel wall begins to thicken at the break suggesting the start of a basal flange. High straight walls on basal flanged bowls/dishes are chronological markers for the Protoclassic period (100 BC –300 AD; Joe Ball personal communication 2013). The slip is too damaged to collect Munsell color readings in the low light of the cave setting. This sherd was found in the back dirt of a large looter's pit just below the entrance to Chamber 3. Found in the same back dirt pile was a fragment of a heavily polished bone tube, which was reburied.



**Sherd 5**

*Provenience:* Chamber 3, rubble stairs along southeast wall

*Type:* Indeterminate, but Tumbac Unslipped ware

*Vessel form:* Jar, restricted

*Rim diameter:* 21.5

*Comment:* Some hematite flecks and calcite in temper. Three rows of circular punctations are present on the shoulder.



**Sherd 6**

*Provenience:* Chamber 3, rubble stairs along southeast wall

*Type:* Indeterminate

*Vessel form:* Bowl

*Rim diameter:* 44 cm

*Comment:* Orange slipped interior and exterior, similar in form to Mt. Maloney Black bowls from Xunantunich area. Interior surface is heavily damaged from stirring. Large chunks of calcite temper and grog are present in the past. There is also a very delicate incision just below the exterior rim.



**Sherd 7**

*Provenience:* Between Locations 124 and 127

*Type:* Indeterminate

*Vessel shape:* Plate

*Rim diameter:* 20 cm

*Comment:* Polychrome slipped interior, exterior unslipped. The interior decoration is a badly eroded red slip on top of an orange underslip. Curving black lines on the interior may be a hieroglyph. Sherd tempered with finely ground calcite and quartz, but large nodules of the latter present. Hematite or another similar large dark nodules on the exterior surface.

Exterior



Interior



**Sherd 8**

*Provenience:* Ledge 2

*Type:* Indeterminate

*Vessel form:* Restricted jar

*Slip color:* N/A

Rim diameter: 27 cm

*Comment:* Vessel is calcite and grit tempered with some large (4.2 mm) chunks of calcite and quartz. A pinched boss is present on the shoulder, below which is a series of aligned ovular punctations. A large overhanging lip is present on the interior at the junction of the rim and body.



### **Sherd 9**

*Provenience:* From top portion of collapsed stairway in Chamber 3

*Type:* Cayo Unslipped (?)

*Vessel form:* Jar

*Slip color:* NA

*Rim diameter:* 27 cm

*Comment:* Vessel is unslipped and was constructed from pink paste with calcite and grog tempering. Incisions (horizontal, “dotted” lines) are cut into vessel’s neck, and the rim is folded on the exterior, creating a slight ridge on the rim. No photograph taken of this sherd.

### **Sherd 10**

*Provenience:* From middle portion of collapsed stairway in Chamber 3

*Type:* Cayo Unslipped (?)

*Vessel form:* Jar

*Slip color:* NA

*Rim diameter:* 19 cm.

*Comment:* Vessel is unslipped and was constructed from pink paste with calcite, grog, and grit tempering. Interior side of sherd is heavily burnished and burned. No photograph of this sherd was made.

### **Sherd 11**

*Provenience:* From large bat hole in passage between Chambers 3 and 4, to the northwest of Locations 128 and 129.

*Type:* Indeterminate

*Vessel form:* Bowl ?

*Slip color:* Yellow

*Rim diameter:* 36 cm

*Comment:* Vessel has mica, quartz, and grit tempering. All surfaces of the sherd are well burnished. The interior surface displays some spalling likely due to heat or stirring activity. The slip is yellow in color, but heavily burned. No photographs of this piece were made.

**Sherd 12**

*Provenience:* Just south of Location 132

*Type:* Indeterminate

*Vessel form:* Incurving bowl

*Slip color:* Interior: Orange slipped; Exterior: Orange and red on cream underslip.

*Rim diameter:* 14 cm

*Comment:* A large flake had been removed from the interior lip of the sherd. Red slip on exterior is on the rim.

Interior



Exterior



**Sherd 13**

*Provenience:* Location 100

*Type:* Indeterminate

*Vessel form:* Indeterminate

*Slip color:* Unslipped

*Rim diameter:* 8.5 cm

*Comment:* Pink plainware. Very fine and well smoothed, but not burnished to a shine. Interior is smoothed and heavily fire clouded. The exterior is fire clouded, but less so than the interior. Lip is folded to the exterior. Paste is very hard and very fine, possibly temperless and nearly vitrified. Possibly part of the same vessel as Sherd 14, although the two pieces did not mend. Several sherds of this type of pottery were found in Chambers 1 and 2. It is highly distinctive and may represent a local tradition.



#### **Sherd 14**

*Provenience:* From looter pile on large rock in exterior of cave. Large rock sits in the center of the Rio Frio Nature Trail passing in front of cave.

*Type:* Indeterminate

*Vessel form:* Indeterminate

*Slip color:* Unslipped

*Rim diameter:* 8.5 cm

*Comment:* Pink plainware, unslipped but very fine and well smoothed, although not burnished to a shine. Vessel is unslipped and was constructed from pink paste with calcite and grog tempering. Overall, similar to sherd13, except no fire clouding on exterior surface. This piece is the same unidentified type of Sherd 13. This type of pottery is so hard that I only managed to accidentally snap a microflake off of the sherd when trying to snap the piece to examine its temper.



**Sherd 15**

*Provenience:* Location 100

*Type:* Indeterminate

*Vessel form:* Bowl

*Slip color:* Brown

*Rim diameter:* 19 cm

*Comment:* Calcite tempered. Interior and exterior are fire clouded.



**Sherd 16**

*Provenience:* Location 100

*Type:* Indeterminate

*Vessel form:* Indeterminate

*Slip color:* Indeterminate

*Rim diameter:* 8.5 cm

*Comment:* This piece is identical to Sherds 13 and 14. It may be part of the same vessel, or if not the identical type. As with the other two, the sherd has been fired very hard, nearly vitrified.



**Sherd 17**

*Provenience:* Location 106 From top portion of collapses stairway in Chamber 3

*Type:* Indeterminate

*Vessel form:* Cup

*Slip color:* Orange with black speckles

*Base diameter:* 20 cm

*Comment:* This piece is terra cotta like in color with a similar hardness and consistency as Sherds 13-15, although clearly from different vessels. The piece is the base of a vertical walled, slightly outflaring vessel. No fire clouding is present on the surface, but the entire base and about 25% of the bottom covered in cave growth, suggesting this piece spent time elsewhere in a cave-like environment near actively dripping water. For tempering, this piece has very fine ground calcite with small metallic inclusions. This sherd makes a clinking noise when struck.



**Sherd 18**

*Provenience:* Location 108

*Type:* Indeterminate

*Vessel form:* bowl

*Slip color:* No slip

*Rim diameter:* 14 cm

*Comment:* Smoothed with striations on the exterior surface. Interior heavily burned. The paste of this vessel is very hard, and the exterior is the same color as the paste.



**Sherd 19**

*Provenience:* Location 108

*Type:* Indeterminate

*Vessel form:* bowl

*Slip color:* NA

*Rim diameter:* 25 cm

*Comment:* Vessel is unslipped and was constructed from pink paste with calcite and grog tempering.



**Sherd 20**

*Provenience:* Location 108

*Type:* Indeterminate

*Vessel form:* Bowl

*Slip color:* NA

*Rim diameter:* 47 cm

*Comment:* Exterior completely exfoliated, but rows of punctuations and “8” shaped incisions at collar. Interior is well smoothed. Sherd is tempered with limestone and calcite.



**Sherd 21**

*Provenience:* Location 108

*Type:* Cayo Unslipped

*Vessel form:* globular jar

*Slip color:* NA

*Rim diameter*

*Comment:* Vessel is unslipped and formed from pink paste with calcite and grog tempering.



**Sherd 22**

*Provenience:* Between Location 100 and 101

*Type:* Indeterminate

*Vessel form:* bowl

*Slip color:* light orange all over

*Base diameter:* 17 cm

*Comment:* Vitrified style discussed above with sherds 13 and 14. Slipped on interior and exterior. Vessel had solid nubbin feet. Overall, this vessel has similar tempering as those other sherds of his vitrified type, Sherds 13 and 14



## Non-ceramic artifacts

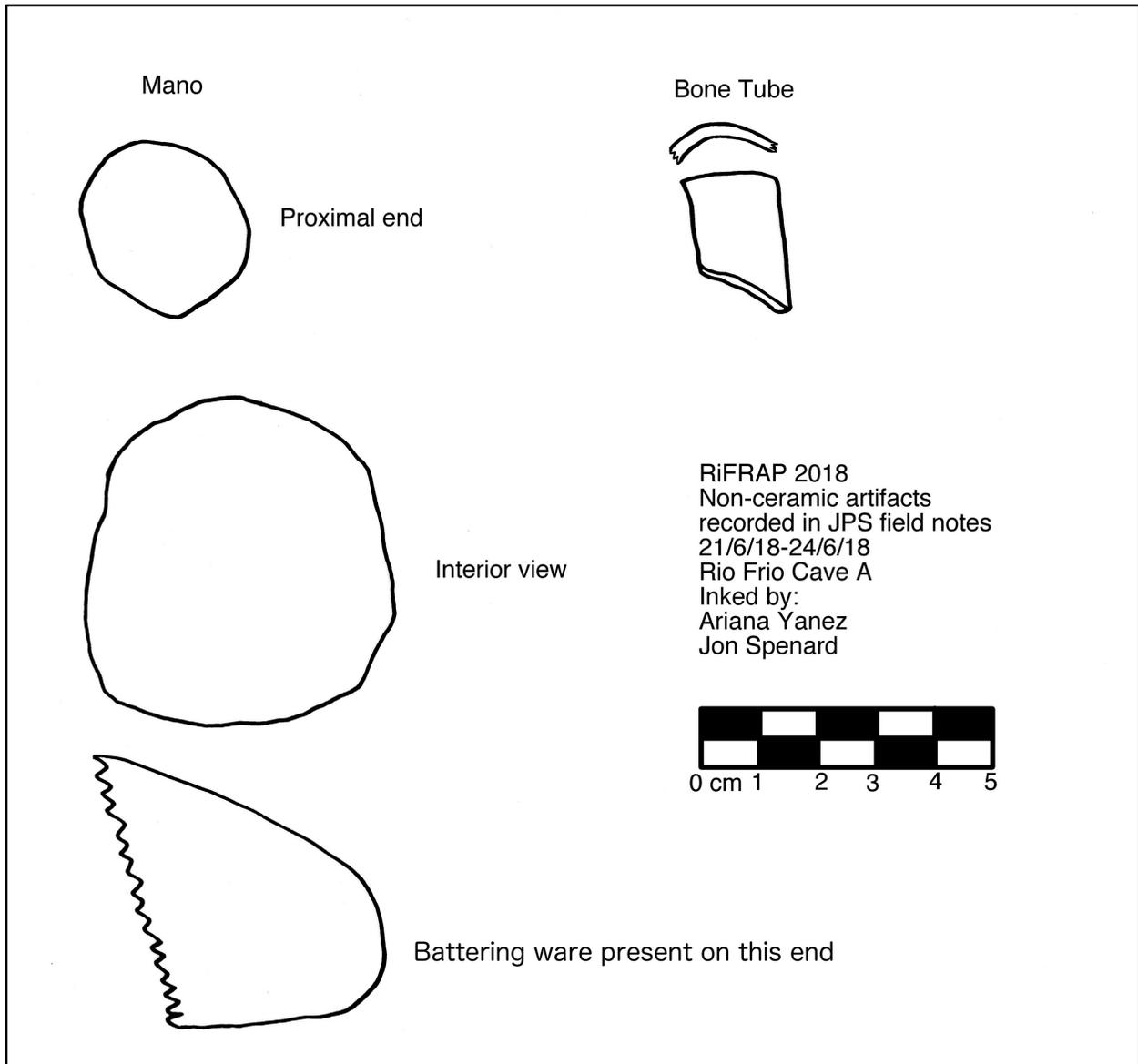
Four non-ceramic artifacts were encountered while conducting reconnaissance of Rio Frio Cave A, a granite mano fragment, a small fragment of a heavily polished bone tube, a complete bone needle, and a quartz cobble. The mano was discovered in the middle portion of the collapsed staircase in Chamber 3, the tube fragment from Location 120, the large looter pit directly below the entrance to the room, and the needle was noted in looter back dirt on Ledge 2. The quartz cobble was found in the same vicinity as the mano.

The mano is loaf-shaped and resembles the preforms recovered from the ground tool workshop at Pacbitun (Ward 2013; **Figures 3 and 4**). However, it is highly polished and the proximal end displays some battering wear indicating it had been used as some kind of hammer.

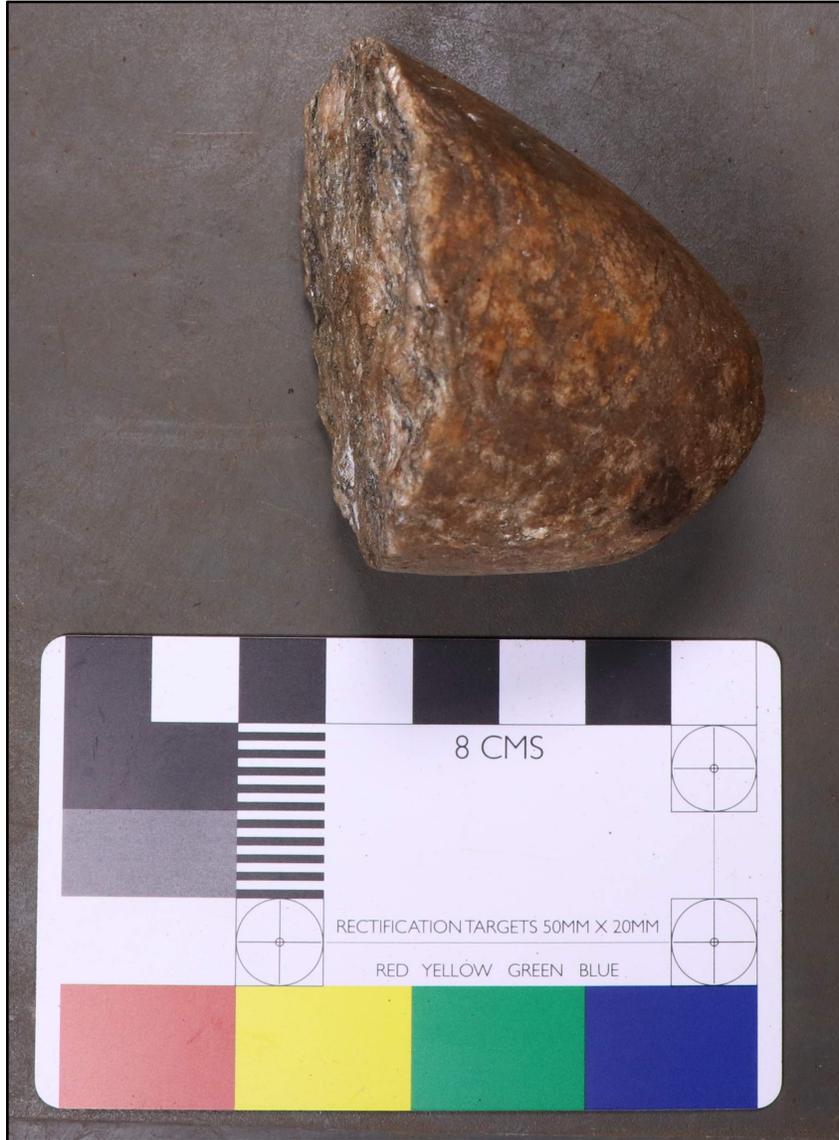
The bone tube has been broken in half along its length, is 2 cm in diameter and in its current condition is 5 cm long (**Figure 5**). It has been heavily polished so much so that a mirror-like reflection is visible on the surface. The remains of a rounded lip are present on one of the ends.

The bone needle is 5.6 cm long with an oval-shaped eye 0.2 cm in diameter (**Figure 6**). It is heavily polished to a shine. With the exception of the distal end, the object is in excellent condition.

Although unmodified, the quartz is not native to limestone, and thus represents a purposeful import of the object into the cave (**Figure 7**). Quartz objects regularly appear cave artifact assemblages, and comparisons with ethnographic literature suggest they may have been used for divination, suggesting a possible use of the cave (Brady and Prufer 1999).



**Figure 3.** Drawings of the mano and bone tube from Rio Frio Cave A.



**Figure 4.** Photograph of Rio Frio Cave A mano (photograph by J. Spenard).



**Figure 5.** Bone tube from Rio Frio Cave A Location 120 (photograph by J. Spenard).



**Figure 6.** Bone needle from Rio Frio Cave Ledge 2 (photograph by J. Spenard).



**Figure 7.** Quartz pebble recovered near mano (photograph by J. Spenard).

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## Preliminary Observations and Interpretation of Rio Frio Cave A

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Observations made during this field season have led to the preliminary hypothesis that the modifications made to Rio Frio Cave A (hereafter Cave A) served to enhance the site as a place where ritual performances and/or processions were carried out. Studies of performance in archaeological contexts have demonstrated that the public performance of ritual served to reproduce power relations, enhance community coherence, and was sometimes an arena where ideologies were negotiated in past societies (Coben 2012; Inomata 2006; Inomata and Coben 2006). These performances would have allowed Maya ritual specialists to play out mythic events and carry out important social and cosmological rituals required to connect local groups with their land and water and ensure their continued access to these critical sources of abundance. Cave A can be understood as a theatrical setting for the performance of rituals that at one level served to keep the cosmological cycle of fertility in motion, while at another level would have served to ideologically connect Maya rulers with these cosmological sources in the eyes of local community members. This would have served to reproduce the social relations that existed at the time the modifications were made or may even have been used to renegotiate them in a way that benefitted the rulers.

In addition, it appears that the modifications were made to accommodate different audiences in each chamber of the cave, perhaps indicating that the space was redesigned to serve processions meant for smaller groups or a few individuals. The space leading from Chamber 1 into the wing that includes Chambers 3, 4, and the Breakdown was heavily modified in a manner that served to restrict access to a few people at a time and that also blocked some of the light coming from the entrance. A possible reason for the modifications is that the cave may have been used to initiate or inculcate ritual specialists into the mysteries associated with the cave, or with rituals associated with caves in general. Another possibility is that small, select groups of community representatives or local ethnic groups were led through the cave to seek oracular aid or to experience the powers of the cave—and by extension those who were associated with its care and maintenance—through the lens of the performances enacted there.

The entrance to Chamber 1 is broad and the talus leading away from the cave could have accommodated a large audience, perhaps a gathering of local community members or groups of dignitaries. In this way, it could have served a similar purpose to plazas at Maya centers like the nearby site of Pacbitun (Inomata 2006). In fact, Inomata (2006:810) noted that caves were one type of place that ritual performances were likely carried out. A large area with evidence of burning (Feature 100) may have served as a location where a ritual fire was kept (**Figure 1**). Smoke from this fire would have replicated the rain clouds that were thought by Maya people to have been emitted from mountain caves; a mimetic device intended to assure continued rainfall. Large public spectacles could have been carried out that assured local farmers that their leaders were carrying

out the reciprocal actions necessary to assure fertility from the ‘Hill of Our Sustenance’, the cosmological source of fertility and abundance (Bernal-García 2001). These same leaders would then be justified in demanding tribute from them in return.



**Figure 1.** Feature 100. A scatter of sherds with evidence of burning.

As Chamber 1 transitions into Chamber 3, the passage was modified to restrict light and the flow of traffic. This would have meant that a smaller group would have been the intended audience in this chamber. As worshippers and/or initiates passed into this chamber, Feature 119 is directly to their left as they begin to drop down. This feature is an extraordinary natural formation whose floor has been shored up and flattened and which forms a small stage-like formation off the top of the chamber. The back wall of the feature is composed of natural flowstone and there is a niche at the back center. This niche, which measures approximately 1m wide, is placed very similarly to where a niche would be in a temple or a church – at the back center of the ‘stage’ space. This feature would have been a perfect place from which to begin the ritual passage into the inner portion of the cave, and the niche is ideally located to display ritual implements, offerings, etc. The feature would have been well suited to performance, resembling a small stage, and could have been used to receive offerings from the visitors as they entered the space. The people passing into the chamber would have been disoriented, their eyes not yet adjusted to the dim light. The performance enacted here may have been intended to surprise them, thereby disorienting them, perhaps to mark the passage from the everyday world into the liminal space of the sacred world within the earth.

The floor in the main portion of the chamber was terraced to allow a few small groups to gather, and it was artificially sealed off from Chamber 4 except for a narrow passage at the bottom of the chamber. Several layers of stones were used to terrace the main floor of the chamber, which would have allowed small groups to be placed at various intervals. Alternatively, the terraces could have permitted a single group to be led through various stages or stations within the chamber. We observed as we documented the cave that a person could easily be hidden in the upper portion of the chamber (Ledge 4), where a natural short passage is found. This person could have served as the voice of the cave (or of the gods or ancestors) if the cave served oracular functions. The two natural openings from Chamber 3 into Chamber 4 were walled off with stones, preventing any light from the opening of the cave from entering that chamber, and partitioning the two into definitively separate spaces (Features 123,124).

Chamber 4 was modified in ways that preserved the original, natural ruggedness of the space while shutting out any light that might have originally leaked in from Chamber 3. The overall phenomenological experience of this chamber is distinctly different from that of the previous one. It is quieter, darker, and less obviously modified by humans, thereby giving it a more natural, unaltered appearance. The space is broken up by enormous fallen boulders from the ceiling that have fallen to the floor. What were once stalactites now jut into the air from their tops. The quiet chittering of bats is a constant companion. The alterations made to this chamber are subtler and were perhaps intended to give the impression that the space maintained its primordial essence. The phenomenological experience here is more contemplative. One team member nicknamed the chamber 'The Inner Sanctum'. Perhaps the space was used as a liminal or transitional space between the exterior chamber and the Breakdown, which leads to the most distinctive symbolic features of the cave – the modified speleothem at the top and the river/stream at the bottom. However, Chamber 4, with its many twists, turns, rises, and falls, could also have been used to surprise, scare, and/or further disorient visitors.

Finally, the Breakdown was only slightly modified, but the few modifications radically changed the natural flowstone at the peak to enhance the symbolic power of the formation when light was shone through it. This feature, found at the peak of the climb into this back chamber on a natural platform that looks over onto Chamber 4, includes several small, thin straws, a few of which were broken. When light was shone through the formation by one team member, the distinct image of a face appeared on the far wall of the Breakdown. Though initially skeptical that this was the original intention of the Maya people who modified the rest of the cave, inspection of the alterations revealed that they had grown sufficient calcification to have been created in antiquity. The light used by the Maya to shine through the would have been torchlight, thereby giving the face the illusion that it was in motion. At the base of the Breakdown, which can be accessed via a steep slope, a river flows through the back of the cave.

The effectiveness of this space as a background for performance cannot be overstated. Here, in the deepest portion of the cave, are two extremely potent symbols – the flickering face of a god or ancestor at the peak, and the flowing water. The latter was likely perceived as an embodiment of the source of the earth's primordial waters. Here visitors could access the mysteries of the world within the earth, the source of the waters and fertile energies that sustained life on the surface (Bernal-García 2001). This indicates that Cave A was probably perceived as the local equivalent of Colhuatepec-Chicomoztoc, the cave that simultaneously offered access to the ancestors and to

the waters within the earth that they were perceived to influence (Bernal-García 2001). Unlike that artificial cave in Mexico, here the water flows naturally through the cave, perhaps adding to its symbolic potency.

If we view Cave A as a location of ritual procession, the Breakdown likely served as the ‘Holy of Holies’, the destination of a procession (perhaps even of a pilgrimage) where the participant could petition the primordial forces that held sway over life and death at the surface. In fact, viewing the cave in its entirety, we can understand it best as a space for processional performance. The stages of the procession could have begun with a public ritual at the entrance that advertised the connection between the officiants and the powers that resided in the cave (perhaps followed by a tour through Chamber 2 – or maybe chamber 2 is for some people while 3, 4, and Breakdown is for others). A select few were permitted into Chamber 3, which has been modified to enhance its capacity for effective performance. Perhaps here myths were recounted, the participants heard the voice of the cave seemingly emanating from its walls, and/or the proper offerings were made to the ancestors and to the earth. In Chamber 4, the participants were offered a contemplative space in preparation for visiting the Breakdown. Perhaps even fewer were allowed within these inner areas than were permitted to enter Chamber 3. Whoever was allowed in would have been ‘winnowed’ in this space, preparing them for what was to come either through fear or quiet, contemplative appreciation and connection. Thus prepared, the final passage into the Breakdown would have been marked by austere majesty and awe. The procession culminated in a markedly powerful symbolic moment, where participants could access the sacred inner realm of the earth.

Such a procession would have served to affirm and renew the beliefs and cosmological understanding of the participants. They would also have enhanced the perception that those who were entrusted with the care and maintenance of the cave and the enactment of the rituals carried out in it were deserving of the power and wealth that they enjoyed. Perhaps this was the reason that so much labor was put into carrying out the extensive modifications that continue to be evident in Cave A to this day.

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