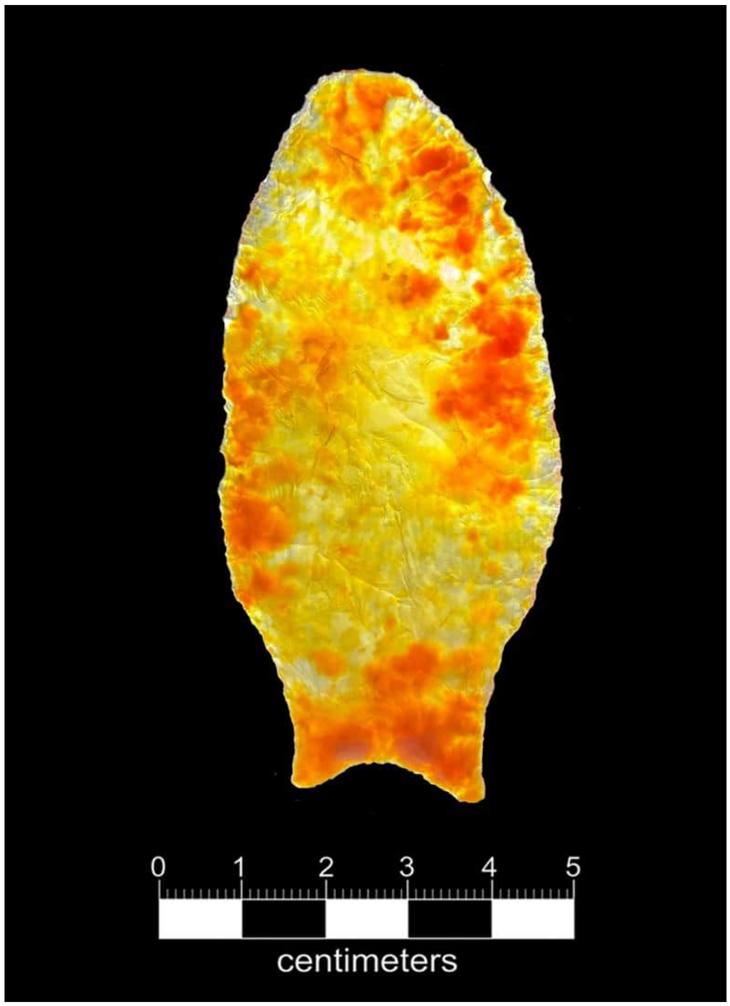
# Results of the 2025 Season of the Pine Ridge Preceramic Project, August Pine Ridge, Belize

**Edited by Jon C. Lohse and Victoria C. Pagano**

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# Acknowledgements

In 2025, we completed the third season of the Pine Ridge Preceramic Project (PRPP) in the August Pine Ridge (APR) village in northern Belize. As with our two previous seasons, we spent a productive three weeks in the field conducting investigations, some of which are described in this report, and laboratory analyses. We also made important and, we hope, impactful progress addressing some of our public engagement and outreach goals for the project. The Preceramic record of APR continues to impress and amaze us, and the more we come to understand details of this record, the more new questions are identified. We are confident that this area is the most prolific Preceramic study area presently known in Central America, and that this work will help to reshape how archaeologists understand the earliest settlement history of the Central American land bridge, from Terminal Pleistocene times onward.

Together with our previous reports, this volume summarizes not only our field and lab progress and outreach activities, but also certain key aspects of the material and technological record of APR, specifically, and Belize generally. There is a long list of topics to dive into, and we still have a ways to go. Topics that we anticipate digging into in greater detail in the future include specific technological details of “types” of complex bifaces that make up what we call the Fluted Biface Horizon, details around Lowe point production and a consideration of what is “not Lowe”, descriptive analysis of post-Paleoindian and Early Archaic periods, and a geoarchaeological assessment of our study area and an understanding of depositional contexts and post-depositional processes that contribute to the potential for analytical integrity. Some of these studies are underway, and others will be the focus of investigations in 2026.

The opportunity to conduct this work in a country where we are visitors and guests is cherished, and we reflect on this opportunity every day with gratitude and appreciation. Dr. Melissa Badillo and Joyce Tun, Director and Assistant Director, respectively, of the Institute of Archaeology (IoA), have been supportive throughout the process of putting this project together. We thank them and the entire IoA staff.

It is an honor to have been able to earn the trust and friendship from the Leadership Council of the APR village. We express our appreciation to Mr. Fred Reneau, Rommel Solis, Dennis Reneau, Alberto Romero, Giovanni Vega, Ilsne Chan, and Estella Ku, and to the landowners who have granted us access to their properties for conducting this work. Continuing to build on these and future relationships will be important to the success of our project.

As before, financial support for this project was possible through donations made to and administered by the Gault School of Archaeological Research (GSAR). In 2025, we also benefitted tremendously from the participation and collaboration of the Center for the Study of First Americans (CSFA) at Texas A&M University, and we deeply appreciate the support and engagement in our work shown by Dr. Mike Waters and Caitlin Doherty. We likewise express our gratitude to the Board of Directors of the Gault School for their support in this endeavor. As editors of this report, Jon Lohse and Victoria “Tori” Pagano extend thanks to their employer, Terracon Consultants, Inc. for allowing time away from our offices (Houston and San Antonio, respectively) and regular obligations in support of this work.

Finally, the people of August Pine Ridge who have welcomed us into their homes and lives. Local arrangements and accommodations have been made significantly easier by the help and generosity of Ireño “Junior” Briceño and his family. We are especially grateful to our team of local workmen: Julio Torres, David Chan, Israel Torres, Carlos Chan, and Elvis Solis. They have shared with us their stories and collections and have asked very little in return. They deserve endless credit for having stewarded and safeguarded the remarkable cultural heritage and record of the landscape they occupy and call home. To all of these people, we express our deepest thanks.

**Cover photo:** The so-called Chan Point, an example of what we call Waisted Fluted points from August Pine Ridge, lit from the back to show the translucence of this variety of material called APR Purple (see Chapter 6).

The 2025 season crew, back row from left to right: Sébastien Perrot-Minnot, Caitlin Doherty, Abby Antinossi, Mike Waters, Israel Torres, David Chan, Junior Briceño, and Julio Torres. Front row: Tori Pagano, Jon Lohse, Carlos Chan, and Elvis Solis. Missing is Mike McBride, who could not attend the season.

Below, from left to right, Sébastien Perrot-Minnot, Ana Beatriz Cosenza Muralles, and Alexis Mojica.

# Chapter 1. Summary of Activities from the 2025 Season of the Pine Ridge Preceramic Project, August Pine Ridge, Belize

**Jon C. Lohse, Victoria C. Pagano, Caitlin Doherty, Sébastien Perrot-Minnot, Abigail Antinossi, Michael Waters, and Mike McBride**

The 2025 season of the **Pine Ridge Preceramic Project** (PRPP; permit number IA/H/2/1/25(11)) was conducted from May 24 to June 14. This, the third season of the project, focused on continuing the research initiatives that were defined from the project's outset in 2023 (Lohse and Pagano 2024). This project draws its guidance and motivation from the principles of our sponsoring organization, the Gault School of Archaeological Research (GSAR): education, research, and conservation. The project's overall goals remain:

1) investigating through field and laboratory studies the remarkable Preceramic record that is to be found in this part of Belize;
2) continued documentation of informal collections that are present within the August Pine Ridge village; and
3) implementing various strategies to develop, sustain, and enrich publicly oriented dialog and educational outreach to help community members and stakeholders across Belize better understand and manage this part of their national heritage.

The project was initiated based on reports of an extraordinary number and diversity of fluted bifaces, diagnostic of Terminal Pleistocene hunter-gatherers moving throughout the region during the Peopling process of the Western Hemisphere. Specimens in question had originated from August Pine Ridge (APR), and probably elsewhere, and were making their way into collections in the US. From the outset, we realized that this project was not only an amazing and deeply important scientific opportunity to document what appears to be the most prolific site dating to this period anywhere in Central America. We moreover reasoned that without the presence of a formal research project working collaboratively with the Belize's Institute of Archaeology (IoA), the APR village council, and members of the APR community, this incredible and perhaps unique record would likely vanish.

The 2025 season differed from our previous two seasons in that we benefited tremendously from the collaborative involvement of the Center for the Study of First Americans (CSFA). Texas A&M University doctoral student Caitlin Doherty brought important technological perspectives concerning South American Terminal Pleistocene chipped stone tool production that enriched our own understanding of how APR's record reflects influences that seem to have come northwards up the Central American land bridge likely starting over 12,000 years ago. Dr. Mike Waters joined the project and provided invaluable guidance and understanding concerning geologic processes around landform depositional histories and the potential for cultural materials to be present in relatively secure, reliable contexts. Samples were collected from open unit profiles that included Optically Stimulated Luminescence (OSL) dating as well as oriented micromorphological samples that, once processed, should allow us to speak to questions of chronology, mechanisms for sedimentation and burial of artifacts, and degrees of disturbance in these sandy soils.

This report contains a summary overview (Chapter 1) of our 2025 outreach and fieldwork activities. Chapter 2 is a view of the geographical setting of our study area and the proposed relationships between natural environment and cultural changes beginning in the Terminal Pleistocene. Chapter 3 is an updated summary of Preceramic chronological understandings that have evolved from our work and that of regional Preceramic projects elsewhere in Belize. Chapter 4 is a descriptive report of geophysical survey work that was carried out on a limited, experimental basis. Relying primarily on electromagnetic resistivity and conductivity, this study investigated stratigraphic conditions in our study area, and identified a number of anomalies that may represent buried remains, features, or other deposits that would require archaeological verification. Chapter 5 is a brief addition to previous reports describing ground stone implements that we have recovered or reported from APR. Finally, Chapter 6 presents diagnostic attributes of the APR Purple stone material type that we believe characterized the APR region and to have been in use from the Terminal Pleistocene into the Early Holocene.

We include images of the public outreach panels (English version) that represent part of our season's efforts in the Chapter 1 Appendix. An updated inventory of materials recovered from our excavations (Appendix A) and an updated inventory of artifact materials that we borrowed from within the APR village (Appendix B) following the report.

## Public Outreach

In 2025, we made important progress toward meeting our public outreach goals. In 2024, we initiated the design and preparation of a set of four portable banners that present in non-technical language some of the objectives and findings of our project. These were designed by Abigail "Abby" Antinossi during her senior year at Rice University (fall 2024, spring 2025); electronic files were brought from the US and printed at CGI Print Shop in Orange Walk according to specifications recorded in the 2024 season. The banners present information about Peopling of the Americas, the Archaic period in Belize, manufacture of chipped stone tools, and the importance of stone artifacts today, and include language from the IoA about cultural heritage management (Figure 1-1).


**Figure 1-1. Abby (left) and Sébastien (right) in front of the banners while visiting local schools. The banners were printed in 2025 for use in public presentations about our project and about Preceramic research in Belize.**

Once completed, these banners were then also translated into Spanish (courtesy of Anouk Brave of Terracon Consultants, Inc. in Houston, and Caitlin Doherty) creating two sets of banners, donated to the IoA, to use for public outreach. It is intended that these would be posted for display on a temporary basis, such as to help support lectures, or used in a more permanent fashion according to the outreach goals and objectives of the IoA. The banners were left with the IoA upon the conclusion of our season and will be considered for display at various locations across the country, including for example the Banquitas Culture House in Orange Walk.

These banners were used in a series of presentations to schools in the region, including the APR primary school (standard 5 and 6 grades); and the La Imaculada RC school (standard 5), the Trial Farm school (grade 5), and San Francisco RC school (standard 5 and 6 grades) in Orange Walk (Figure 1-2). Where digital projectors were available, a power point slide show was also incorporated to help provide context and illustrations. To help supplement these lectures about Belize's remarkable Preceramic history, we also circulated cast replicas of some of the artifacts that have been recovered from APR so that students could engage with the material through sight and touch. Making a tangible connection between stylistic variation and different forms of flaking technology represented in the APR materials.


**Figure 1-2. Collage of photos taken during PRPP school presentations.**

What we observed in these talks was that, generally, students were initially shy and reluctant to engage with questions or comments. Given a little time, however, several students opened up with a number of relevant, thoughtful, and perceptive questions about our work and the nature of archaeology. In these lecture sessions, we intentionally mixed up the interaction dynamics between giving information, asking open-ended questions, encouraging discussion, and responding to student questions both in small groups and one-on-one conversation. We found that having multiple project personnel representing different ages and nationalities allowed our project participants to engage simultaneously with different groups of students on many levels. Teachers, too, were active participants in these sessions, and our hope is that we were able to deepen their appreciation for and understanding of earlier-than-Maya periods of Belize's rich past.

Another element of this project's public outreach plans involves creating a series of high-resolution, true-color cast replicas of some of the artifacts that have been recovered from APR. Working with Mammoth Run Lithic Casting Lab (Colorado, USA), we are currently awaiting the completion of approximately 25 individual specimens representing fluted biface, Sawmill, Lowe, and Pine Ridge point types. Four sets of these 25 specimens will be made; one set will be delivered to the IoA to be exhibited with the banners or displayed elsewhere. We anticipate that these replicas will be available in the fall of 2026.

## Field Investigations

In 2025, we conducted excavations in two separate "areas" (Figure 1-3). In keeping with our field designation system, each area is named for some nearby feature or landmark. This season, work was carried out in Three Corners (TC), and then again in APRC where we had excavated in both 2023 and 2024. These areas were chosen based on the intactness of the original ground surface, visibility of lithic debris on the surface, and reports from our local laborers about where artifacts had been previously recovered or observed during sand quarrying. Altogether with our earlier excavations at APRC, Four Pine Ridge (FPR), Monument Valley (originally named SPMQ), and a pair of units at Bajo Palmito (or BPa), these excavations cover a kind of transect that descends from the southeast to the northwest, starting close to the top of the elevated pine ridge itself and ending close to the largest of the perennial aguadas located on the east side of the village (Figure 1-4).

In 2025, our excavations included shovel tests, and 1x2m as well as 2x2m units (Table 1-1). One "unit" (CL) was designated for items collected from the surface. Some units were located immediately adjacent to each other to form larger blocks. Below, each area is discussed along with some of the excavation highlights. Artifact recoveries by unit are presented in Appendix A.

### Three Corners

Investigations in Three Corners included a 2x6m block consisting of three 2x2m units (CB, CC, and CD; Figure 1-5). Additionally, in this area a shovel testing program was carried out a couple of hundred meters to the southwest as a way of expediently investigating for the presence and possible density of lithic artifacts that may indicate Preceramic occupation patterning (Figure 1-6). In 2024, we conducted shovel testing in this manner at area FPR, with individual probes spaced approximately 20-30m apart. That activity yielded positive results but appeared inconclusive with respect to discrete concentrations of artifacts that could conceivably represent a discrete locus of preceramic activity. That is, several (positive) shovel tests yielding artifacts are interspersed with negative ones in ways that fail to show clear horizontal boundaries to the deposits (Lohse et al. 2025: Figure 1-12). In 2025, two different phases of shovel testing were conducted. In the first phase, exploratory probes were excavated at approximately 25m intervals; these probes (n=19) were designated CA-01 to CA-19. Those results were similar to our 2024 program with several positive and negative STs intermixed in seemingly non-patterned ways.


**Figure 1-3. Investigation areas (not showing specific units) since 2023.**

**Table 1-1. Units of investigation in the 2025 season.**

| Unit | Area | Unit Type |
|---|---|---|
| **CA** | Three Corners | Shovel tests (n=19) |
| **CB** | Three Corners | 2x2m (part of 2x6m block) |
| **CC** | Three Corners | 2x2m (part of 2x6m block) |
| **CD** | Three Corners | 2x2m (part of 2x6m block) |
| **CE** | Three Corners | Shovel tests (n=54) |
| **CF** | APRC | 2x2m (part of 2x3m block) |
| **CG** | APRC | 1x2m (part of 2x3m block) |
| **CH** | APRC | 1x2m |
| **CI** | APRC | 2x2m |
| **CJ** | APRC | 2x2m |
| **CK** | APRC | 2x2m |
| **CL** | APRC | Surface collection |
| **CM** | APRC | 2x2m |
| **CN** | APRC | 2x2m |
| **CO** | APRC | 2x2m |
| **CP** | APRC | 2x2m |
| **CQ** | APRC | 2x2m |
| **CR** | APRC | 2x2m |

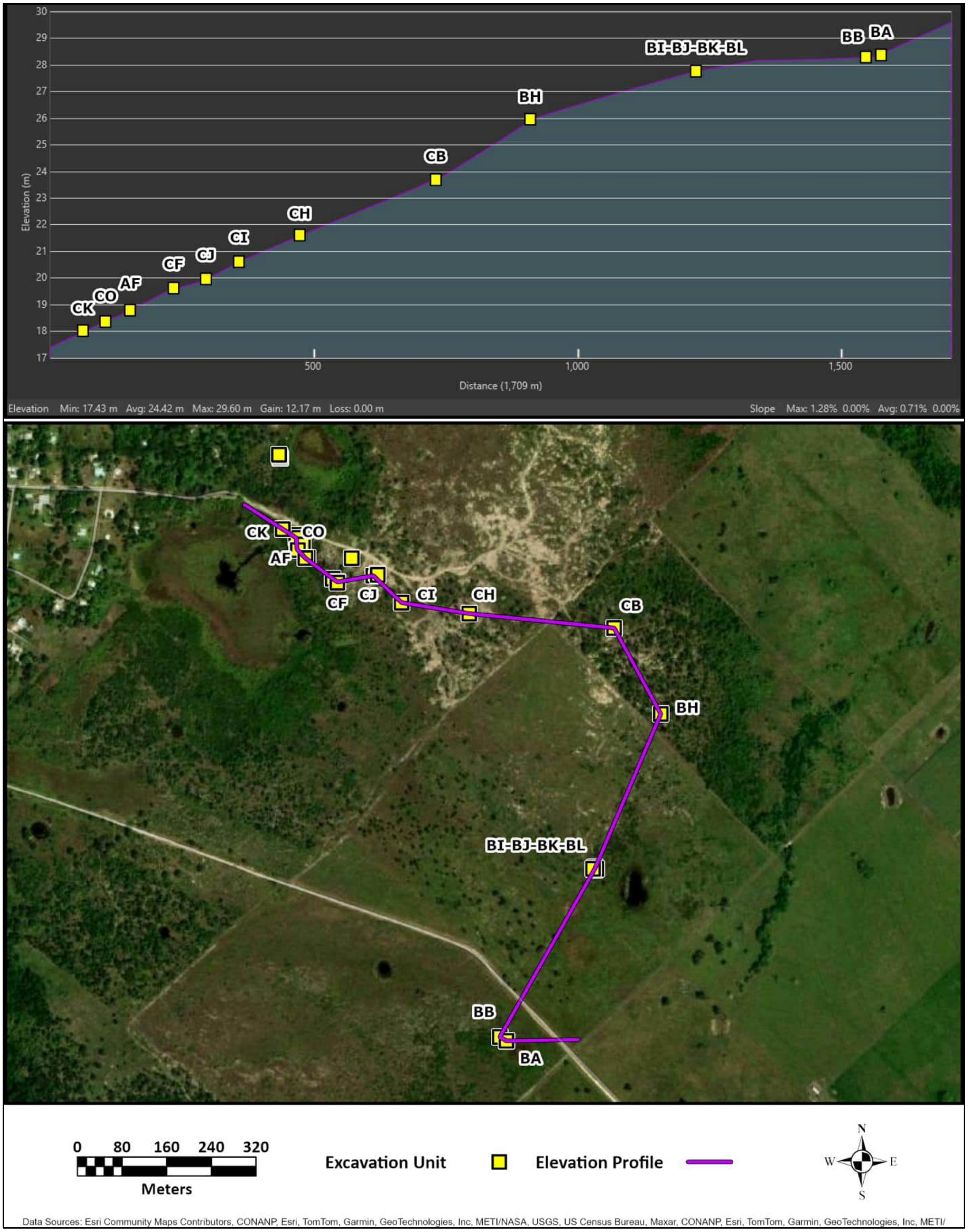


**Figure 1-4. Elevational traverse showing the relative position of our excavation units along the western slope of the Pine Ridge**

**Figure 1-5. Excavation block in Three Corners area consisting of units CB (at top), CC (middle, not completely excavated), and CD (at bottom). Tori Pagano (distant) talks with Caitlin Doherty (left) and visiting Dr. Rob Rosenswig (right).**

One probe (CA-11), however, contained an unifacial scraper (Figure 1-7) that we identify as Paleoindian in age. In response to this find, several additional probes were excavated across an area measuring approximately 40x40m around this find but at approximately 4m intervals. These probes were designated as units CE-01 through CE-54 (see Figure 1-6). These results documented an apparent concentration of artifacts in the southeast corner of this shovel tested area, suggesting that discrete artifact clusters seem to be present on the landscape here that can be documented using methodologies that are of sufficiently fine scale. Follow-up excavations in 2026 might expand on and further investigate this apparent concentration.

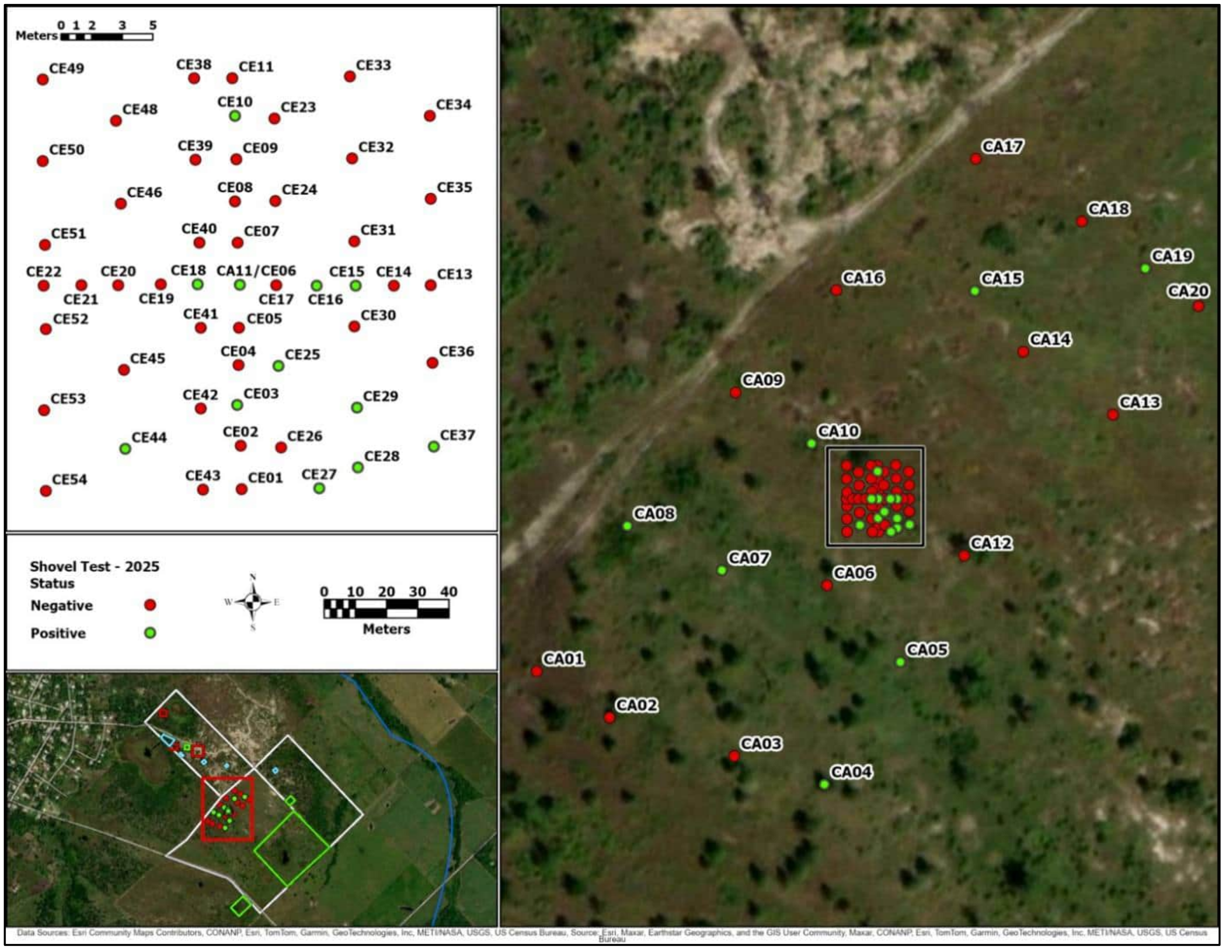


**Figure 1-6. Shovel testing program conducted in the Three Corners investigation area.**

Based on technological characteristics, the 2x6m block (Units CB, CC, and CD) produced exclusively Archaic-period chipped stone materials. Flakes recovered from here all have single facet, hard hammer platforms and none show evidence of having been removed from what we consider to be complex (e.g., formal, temporally diagnostic) bifaces. All lithic remains that were observed on the surface in the vicinity of these units likewise had hard hammer platforms and lacked any evidence of biface manufacture. On this basis, we interpret this area as primarily Archaic in age. Two chert nodules that were used as flake cores were recovered from the bottom of Unit CB, immediately above the basal clay substrate (Figure 1-8). Noteworthy, however, is that these two cores were of a material type that we refer to as APR Purple (Antinossi 2025, Chapter 6), which is especially abundant in our diagnostic Paleoindian collection and which extends into materials like Lowe points that have been dated to the Early Holocene, ca. 10,200 to 9300 years ago (Prufer et al. 2019). APR Purple has so far not been documented in debitage assemblages that lack evidence for complex biface production, indicating that it had either been abandoned as a source or had become unavailable by that time. On this basis we suggest that the bottom levels of this block may date to approximately 9000-8000 years ago.


**Figure 1-7. Paleoindian end scraper (specimen CA-11-01) from shovel testing program conducted in the Three Corners investigation area.**

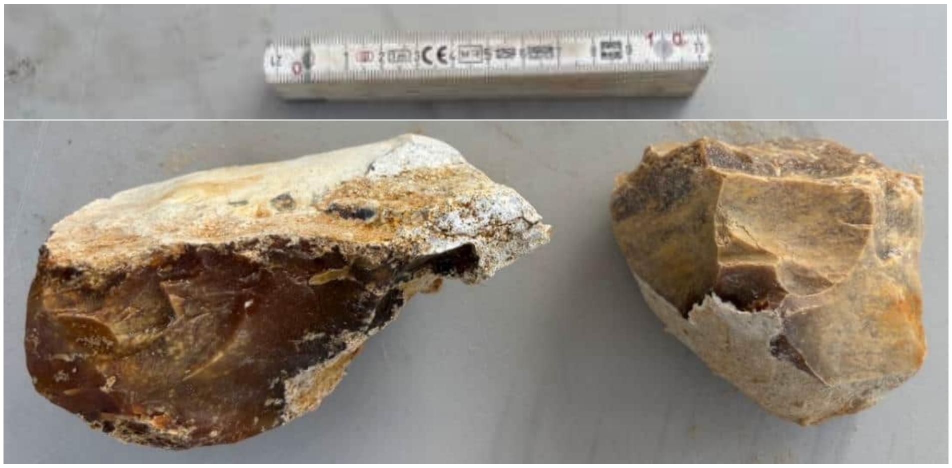

**Figure 1-8. Two flake cores from the bottom of Unit CB made of a chert type referred to as APR Purple.**

## APRC

Several units were opened in APRC in our 2025 season; two of these were 1x2m in size (CG and CH) while the others all measured 2x2m. Units CF and CG were located next to one another to create a 2x3m block. To date, APRC remains by far the most heavily investigated area for our project (Figure 1-9).


**Figure 1-9. Figure 1 9. Units excavated in APRC research area through 2025 (three seasons). Units beginning with "C" were excavated in 2025.**

Based on apparent technology of recovered materials, the APRC area was occupied starting in Terminal Pleistocene times, although we have also recovered Archaic period chipped and ground stone materials as well as Maya-period specimens. The range of occupation history here is not surprising considering the nearby presence of multiple freshwater aguadas.

While the overall assemblage from the area is not unmixed, the cluster of units from CN to CR contains chipped stone materials that reflect Terminal Pleistocene stone tool production and perhaps even occupation. Diagnostic tool types include a pronounced graver, the distal portion of an end scraper and another smaller flake used as a scraper, and an early-stage biface preform made from a flake blank (Figure 1-10).


**Figure 1-10. Small assemblage of tools and preform indicative of Early Paleoindian occupation. Key strategies for achieving extremely thin as well as flat cross-sections include beginning with flake blanks (rather than reduced biface preforms); and very thin "double-struck" flakes, and matching collateral flake removals from opposing margins with a) diving hinge and b) feather terminations that converge around the longitudinal centerline.**

In addition to the small assemblage of tools and preforms from the Unit CN-CR cluster, debitage from here also provides evidence for Early Paleoindian biface manufacture. Recent combined experimental replication along with analysis of archaeological specimens of fluted Fishtail bifaces from South America (Suárez and Bradley 2025) has contributed significantly to our understanding of the design goals and manufacturing techniques for characteristic South American Fishtail bifaces, and how these differ from North American-influenced Clovis bifaces. Among other differences (Lohse et al. 2026) is the emphasis on very thin, flat cross-sections for Fishtail bifaces; we see this same emphasis on several specimens from APR that we have identified as Waisted Fluted (Lohse et al. 2025). Feather terminating flakes that remove the matching hinge scars are referred to as "fish form flakes" (Suarez and Bradley 2025:13). Flakes matching several of these characteristics were recovered from lower levels of Unit CP, including several of APR Purple material (Figure 1-11) as well as a material for which no finished specimens have yet been identified (Figure 1-12). Excavations in 2026 will follow up on these recoveries, which could represent the first fluted biface manufacturing locale recorded in Belize and one of the few known in Central America.

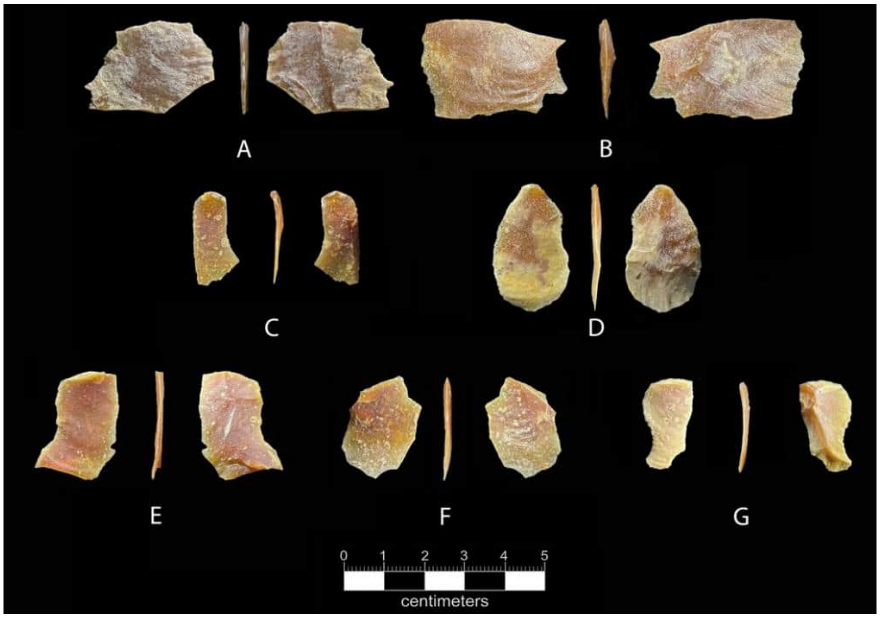


**Figure 1-11. Biface production flakes of APR Purple from Unit CP-03. Note the thinness and relative flatness of each specimen.**

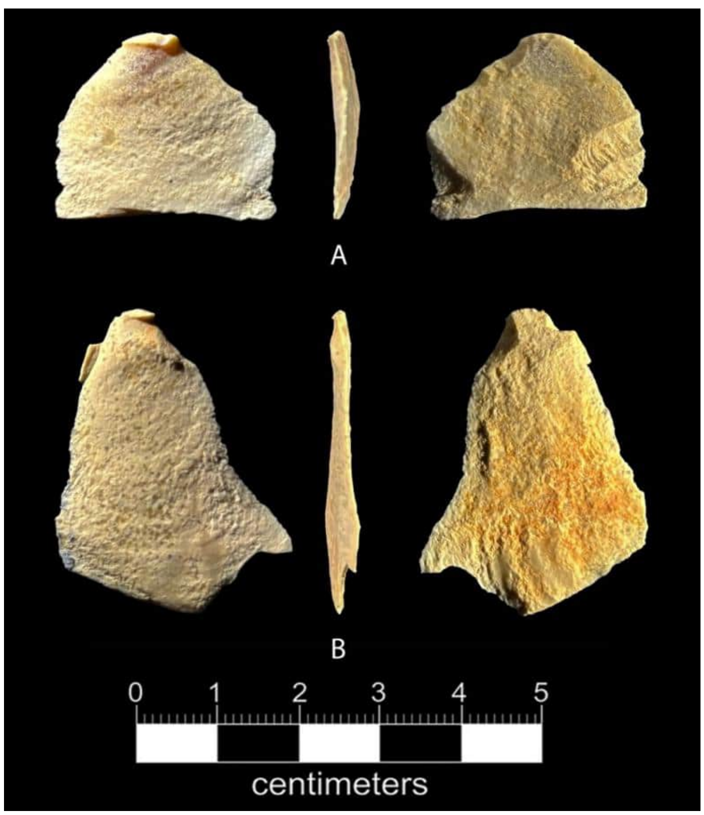


**Figure 1-12. Biface manufacturing flakes of an unknown material from Unit CP-04. Note the pronounced "lip" on the ventral side of the striking platforms. These well-prepared platforms are distinctive to early, perhaps Paleoindian time periods. Specimen B may be a shoulder thinning flake, described by Suarez and Bradley (2025:15) and characteristic of end phase (Phase 4) Fishtail production.**

## Conclusions

In our 2025 season, we continued to add much valuable understanding about the Pine Ridge and the record of Preceramic occupation here. Pending geoarchaeological analyses will help shed light on the depositional history of this landform and will contribute to our understanding of the stratigraphic and contextual integrity of these deposits. As was the case in previous seasons, our impression based on debitage recoveries (and, increasingly, from the presence of small tool assemblages) from some locales is that the potential exists here to document very high-resolution contexts. If proven true, this finding would be a stunning possibility for a study area characterized by loosely consolidated sandy sediments with as much as 13,000 years of occupation remnants and surface alterations. As we have spent more time in this area, our understanding of nuanced characteristics has likewise increased.

One of the most important examples of this developing understanding is in the way we understand Preceramic technological changes, including the preparation of different forms of complex biface types and the biproducts of those manufacturing behaviors. There are sharp, clear, and unambiguous changes related to the preparation of flakes for removal from objective pieces including on one hand complex biface forms (including Clovis, Fishtail, Waisted Fluted, Sawmill, Lowe, Unfluted Lanceolate, Pine Ridge, and other types) and on the other hand flake cores and macroflakes and blades characteristic of later Archaic periods. The differences between these two technological objectives are clear enough that flaking debris associated with each can be taken as diagnostic, in a gross, general sense, of what have been called Paleoindian versus Archaic time periods. Based on our ongoing research, we propose to use this major technological distinction as the basis for distinguishing between Early and Late Preceramic periods (see Chapter 3).

Apart from gains in archaeological knowledge, our activities with respect to public engagement and educational efforts have increased since our initial (2023) season, and we are pleased that these efforts are paying larger dividends as a result. The final objective for this part of our project agenda would include the production of the high-resolution epoxy cast replicas of some specimens and the integration of these into our educational activities. We look forward to potentially completing this goal in the fall of 2026.

Future excavations may work within the general transect of research areas that is indicated in Figure 1-4 to pursue and complete some of the initial observations previously described. Specifically, our project intends to convert our excavation strategies from higher volume, rapid recovery to lower volume, increased resolution methods to try and ascertain whether discrete occupational clusters of artifacts can be confirmed in some, albeit very small distributions. Continued material characterization studies would help further demonstrate the prevalence and exploitation behaviors associated with APR Purple and other materials, including in relation to other regional materials.

Our current impression is that APR Purple was introduced into the archaeological record perhaps as early as Clovis times and that it disappeared sometime in the Early Holocene. Do these changes relate to cultural shifts associated with population movements, or can they be understood in relation to environmental change, such as sea level rise that may have removed access to well-known outcrops of this valued raw material? In any event, the patterned exploitation of this material, which we believe is *not* associated with the Northern Belize Chert Bearing Zone (NBCBZ), likely constitutes one of the earliest demonstrable "culture areas" and regional cultural traditions defined so far anywhere in Central America. Finally, combined geoarchaeological investigations with the results of preliminary geophysical survey (see Chapter 4) will further enhance our understanding of stratigraphic conditions and contexts around APR.

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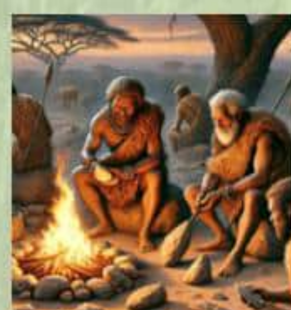
## Chapter 1. Appendix – PRPP Banners

# THE PEOPLING OF THE AMERICAS

**Archaeologists** are unsure when people first arrived in the New World, but it could have been as much as 20,000 years ago. Once here, they eventually migrated south through Central America in a process called "The Peopling of the Americas." Regardless of the exact age, this process happened during the Pleistocene, or the last Ice Age.



**Today**, some of the only evidence of these people is worked stone from the tools they left behind. Archaeologists can study these stone tools (called lithic artifacts) because they preserve very well. One culture found across North America is called Clovis; these spear points have a characteristic "fluted" base. Clovis points are around 13,200 to 12,800 years old. In South America, many early hunters made Fell, or Fishtail points; these date from about 12,900 to 12,000 years ago. These tools are defined by a characteristic stem at the base, and many were also fluted.

Fishtail/Fell Points

Waisted-Fluted Points

Clovis Points

**Belize's** record has both Clovis and Fishtail points, as well as a third style that reflects the blending of these influences. Archaeologists are finding evidence for overlapping interactions between people carrying social practices from South and North America. Even back then, Belize was a melting pot of cultures!

# THE ARCHAIC IN BELIZE

**Around** 11,500 years ago, global climates became warmer and wetter. This was the beginning of the Holocene, and by this time people were moving around across shorter distances. One result of this "settling in" was the appearance of increasingly localized cultures. This gradual transition reflects change from what archaeologists call Paleoindian to Archaic ways of life. Archaeologists recognize the emergence of these localized Archaic cultures by artifacts that were left behind, including stone tools.

| POINT TYPE | CHARACTERISTICS | REGIONS | PRODUCTION PERIOD |
|---|---|---|---|
| **Sawmill** | Thick, concave base<br>Shallow fluting | Maya Lowlands | 11,000–10,000 years BP |
| **Lowe** | Triangular shape,<br>Finely worked edges | Belize | 10,000–9,000 years BP |
| **Unfluted Lanceolate Point** | Lanceolate shape<br>No fluting<br>Often symmetrical | Maya Lowlands | 12,000–10,000 years BP |
| **Pine Ridge Biface** | Broad flat faces<br>Steep edges | Orange Walk, Belize | 12,000-11,000 years BP |

**From** research at August Pine Ridge and elsewhere, archaeologists have classified some distinct "types" of tools that reflect this change in settlement dynamics. These types include Pine Ridge, Unfluted Lanceolate, Sawmill, and Lowe.

**Pine Ridge** and Unfluted Lanceolate bifaces reflect influences from northern South America up to Mexico, respectively. Sawmill points are not yet well understood, but Lowe points, the latest of these types, have only been found in Belize.

**Ground stone** implements first appeared around 11,500 years ago. Forms included bowls, mortars, pestles, and stone slabs. They were used for processing plants for consumption through grinding or pulverizing. Bowls may have held liquids like soups or stews. These objects reflect the increased importance of plants, including early cultigens like squash and maize, in peoples' diets.

# MAKING LITHICS

**Although** complex bifaces like Lowe points may have disappeared around 8000 years ago, stone tool traditions continued for the next several thousand years. Later Archaic toolmakers fashioned large blades and flakes that were then trimmed on one side (these are called unifaces) and used for cutting, digging, or scraping.

**This** technological system has also been documented in the Greater Antilles, leading some scholars to suggest that early populations from mainland Yucatan Peninsula may have been the earliest colonizers into the Caribbean.


**Maya** civilization emerged in Belize about 3000 years ago, or around 1000 BC. It is important to remember that people were living in Belize long before this date. These people, the ones who made those earlier lithic technologies and who began to settle into communities in the Holocene, may have contributed to the earliest languages and cultures that today we recognize as Maya.

# MODERN LITHICS

**Lithic** technology can be an important way to study the cultural history of Belize. Many Paleoindian and Archaic sites have been destroyed over time, but archaeologists can use stone tools and other artifacts to understand these ancient cultures. Archaeologists use changes in tool styles and technologies to trace settlement patterns, cultural interactions, diet changes, and other changes.

**These** stone tools still help connect people today. Each one represents a tiny piece of history: when you hold a chipped stone tool in your hands, you are holding the same item that someone else made 13,000, or 9,000, or 4,000 years ago. You are a part of that history! Today, they are found in sand pits all around the August Pine Ridge area. Archaeologists are very grateful that these tools have been found, and that they are able to study them with permission of their owners.

**The Institute of Archaeology** of Belize works to preserve and document archaeological artifacts all across Belize. Their motto is "Preserving the Past for the Future". The Institute manages all archaeological research in Belize, including the research being done at August Pine Ridge. One of the Institute's programs, the "Artifact Documentation" program, monitors artifact collections across Belize. The process of documentation involves filling out a form to let the Institute know that you are in possession of a cultural artifact. They will send a member to confirm the presence of the artifact, and inform the owner of what proper steps should be taken to preserve that item. The artifact does not leave the household of its owner. Every so often, someone from the Institute will check to make sure that the artifact is still in good condition. This program does important work to ensure that Belizean history is being preserved. For more information on this program, call +501-227-0811.

# Chapter 2. The Geographical Setting of August Pine Ridge (Orange Walk District, Belize) and Its Implications for the Preceramic Occupations

**Sébastien Perrot-Minnot, Jon C. Lohse, Mike McBride, Victoria C. Pagano, and David T. King, Jr.**

Since 2023, the Pine Ridge Preceramic Project (PRPP) has documented exceptionally rich preceramic remains at August Pine Ridge (APR), Orange Walk District, northern Belize (Lohse, McBride, and Perrot-Minnot 2025). They concern the Paleoindian and Archaic periods, beginning in Belize sometime earlier than ca. 13,000 cal BP and ending around 3000 cal BP respectively, the latter date corresponding with the emergence of the first Maya village communities (Lohse et al. 2006; Rosenswig 2015, 2020). The transition from the Paleoindian period to the Archaic period in the Maya area is poorly dated but has been recognized as corresponding with the intensification of subsistence practices in the early stages of the Holocene, as the climate became warmer and wetter and forests developed (Brouwer Burg and Harrison-Buck 2024; Lohse 2020; Prufer et al. 2021).

Most Paleoindian and Archaic artifacts from APR that we have inventoried and studied were discovered by residents working in sand extraction, an important local economic activity since the 1950s (Perrot-Minnot 2025b). On the other hand, the excavations and surveys carried out as part of the PRPP have enabled us to shed light on the oldest human occupations of the area in their archaeological, stratigraphic, and geographical context in the broadest sense. However, the limited excavations to date, the disturbance and poorly known nature of the stratigraphy, and the absence, for the moment, of clearly defined and precisely dated archaeological deposits make interpretation of the archaeological record challenging.

Throughout the PRPP project, we carefully examined the natural environment of the archaeological remains, a subject that has been the focus of fruitful discussions between researchers from different disciplines. Indeed, the study of the geographical setting is particularly important for understanding prehistoric groups, whose lives depended heavily on the exploration, observation, and exploitation of local resources, in situations of colonization or recolonization of lands. As David Meltzer (2009: 221) pertinently summarized, “Hunter-gatherers hedge their survival bets by learning the landscape.”

## The Geographical Setting of August Pine Ridge

The village of APR is located in northern Belize, about 20 kilometers southwest of the town of Orange Walk, between the Rio Hondo (border with Mexico) and the New River, and 56 kilometers from the Caribbean Sea (Figures 2-1, 2-2, 2-3). The site is located on the Yucatan Platform (or Shelf), a vast limestone platform dating from the Paleogene to the Quaternary periods and that forms part of the Maya Block in the south of the North American Plate. This province, with its nearly horizontal stratification in most places, has no tectonic folding or orogenesis (Marshall 2007).


**Figure 2-1. Location of APR in Belize. Base map: Wikimedia Commons.**

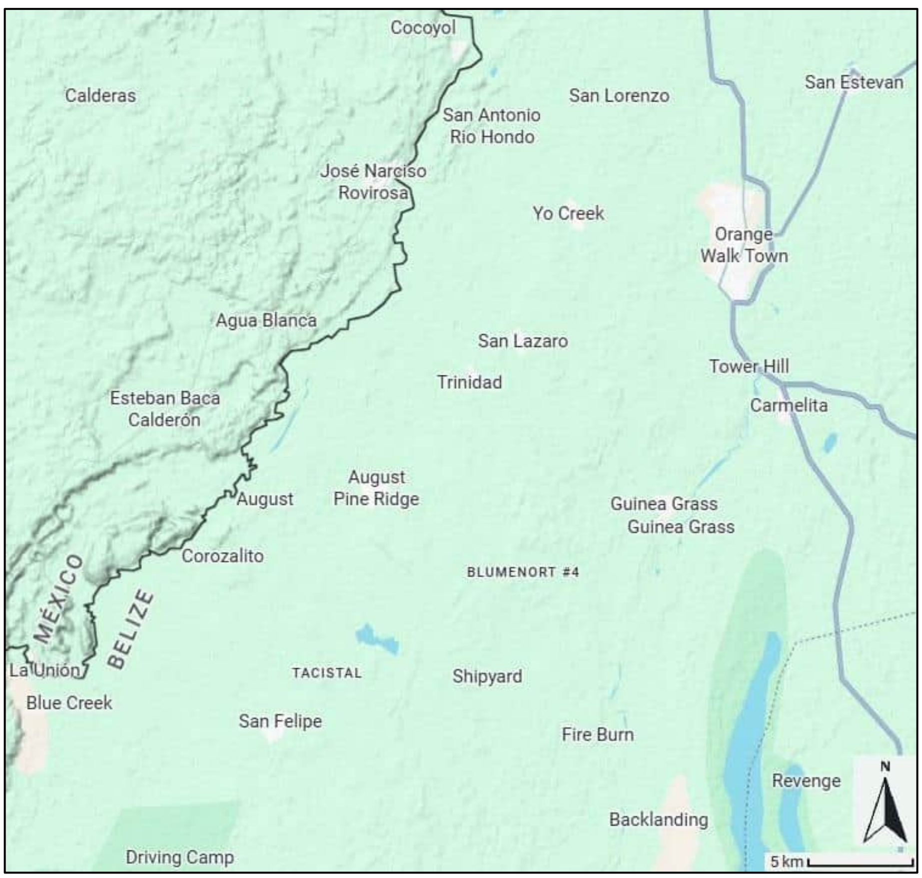



**Figure 2-2. Location of APR in northern Belize. Base map: USGS.**

On a smaller scale, APR belongs to the Rio Hondo Fault Zone, which stretches from Petén (northern Guatemala) to the east coast of Yucatan; this feature composed of northeast trending normal faults and half-grabens formed from the late Eocene to the Pliocene (Ensley 2024). In this general geological context, our study area has very gentle relief. Its altitude ranges from approximately 10 to 50 m above sea level, from floodplains to the undulations of the San Pablo Ridge, which stretches between the two aforementioned rivers (Hammond 1985:4). To the west of the Rio Hondo, on the Mexican side, are groups of hills commonly known as "*sierritas*." Those bordering the river reach altitudes of around 200 m; from APR, they give the impression of a kind of natural wall (see Figure 2-2).

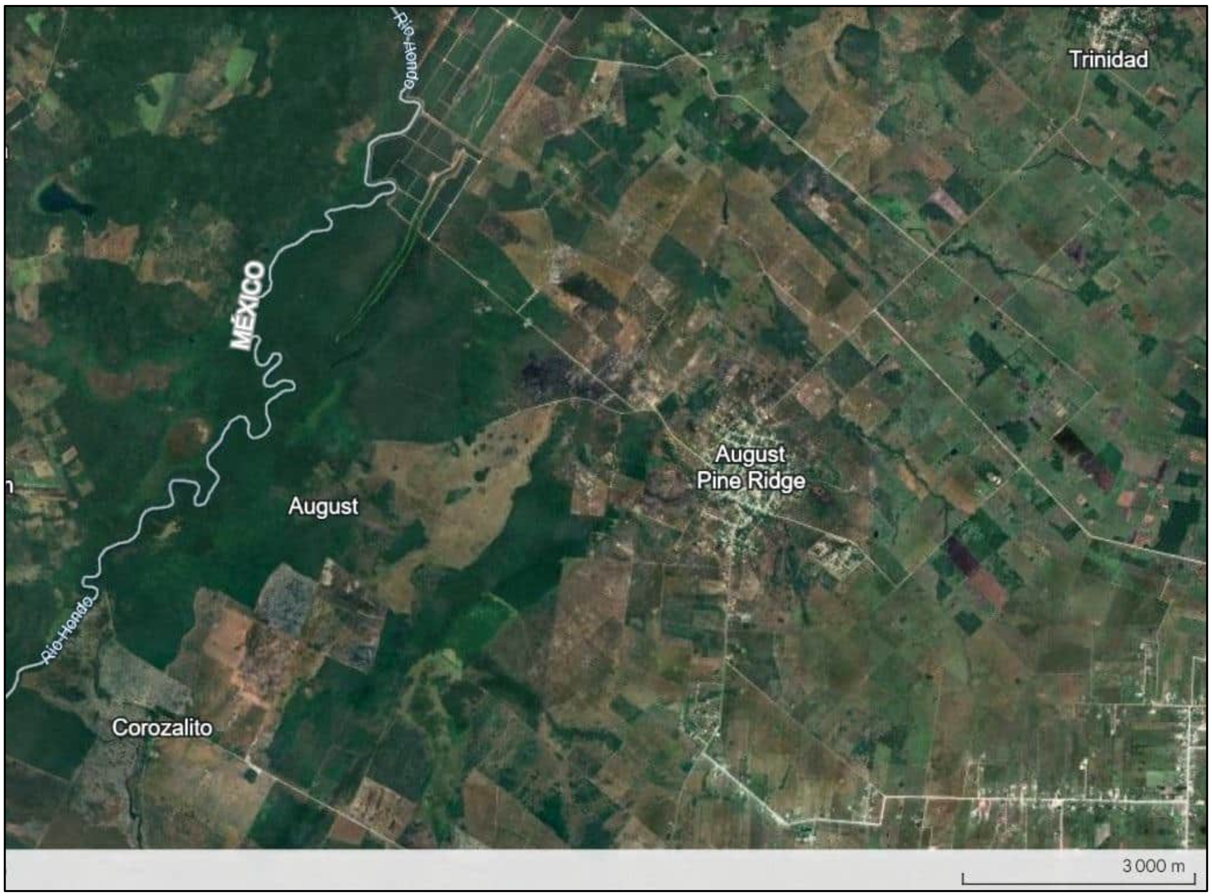



**Figure 2-3. Satellite image of APR and its surroundings. Source: Google Earth.**

On the geological map of Belize that was compiled and interpreted by Jean H. Cornec (2015) (Figure 2-4), our study area is mainly located on an outlier of the Red Bank Group (RBG, in pink on the map), which the map legend describes as, "*variegated mottled clays, gypsum (& chalcedony pseudomorphs), sands, chert, chalcedony* [...] *clays and silica* […]." Surrounding it is the Orange Walk Group (OWG, in orange on the map), containing "*marls, micritic, coral and coquinal limestones* […] *gypsum (clay, sand),*" and a Quaternary unit (in yellow) with "*alluvium, river terraces, sand bars, chert/quartz gravel terraces* […] *along, modern reef, calcareous sand and mud, volcanic ash falls.*" The RBG is now dated from the late Paleocene to the early Eocene (King and Petruny 2023; Ricketts et al. 2021), while the older OWG probably dates from the Paleocene as well (King and Petruny 2023).

It should be clarified that the chert is very rare in the OWG, and much more common in the Doubloon Bank (the areas in green on Cornec's map, see Figure 2-4). In both formations, it is in the form of nodules in the limestones.

In the RBG, which probably derived from weathering of the Orange Walk and Doubloon Bank formations, chert is detrital (occurring as rounded pebbles) (King et al. 2004).

Regarding geology, Thomas Hester, Harry Shafer, and Thena Berry (1991) also reported the presence of chalcedony suitable for tool manufacturing in APR, in their study of the chipped stone artifacts from the Maya site of El Pozito. We are unaware of this source.

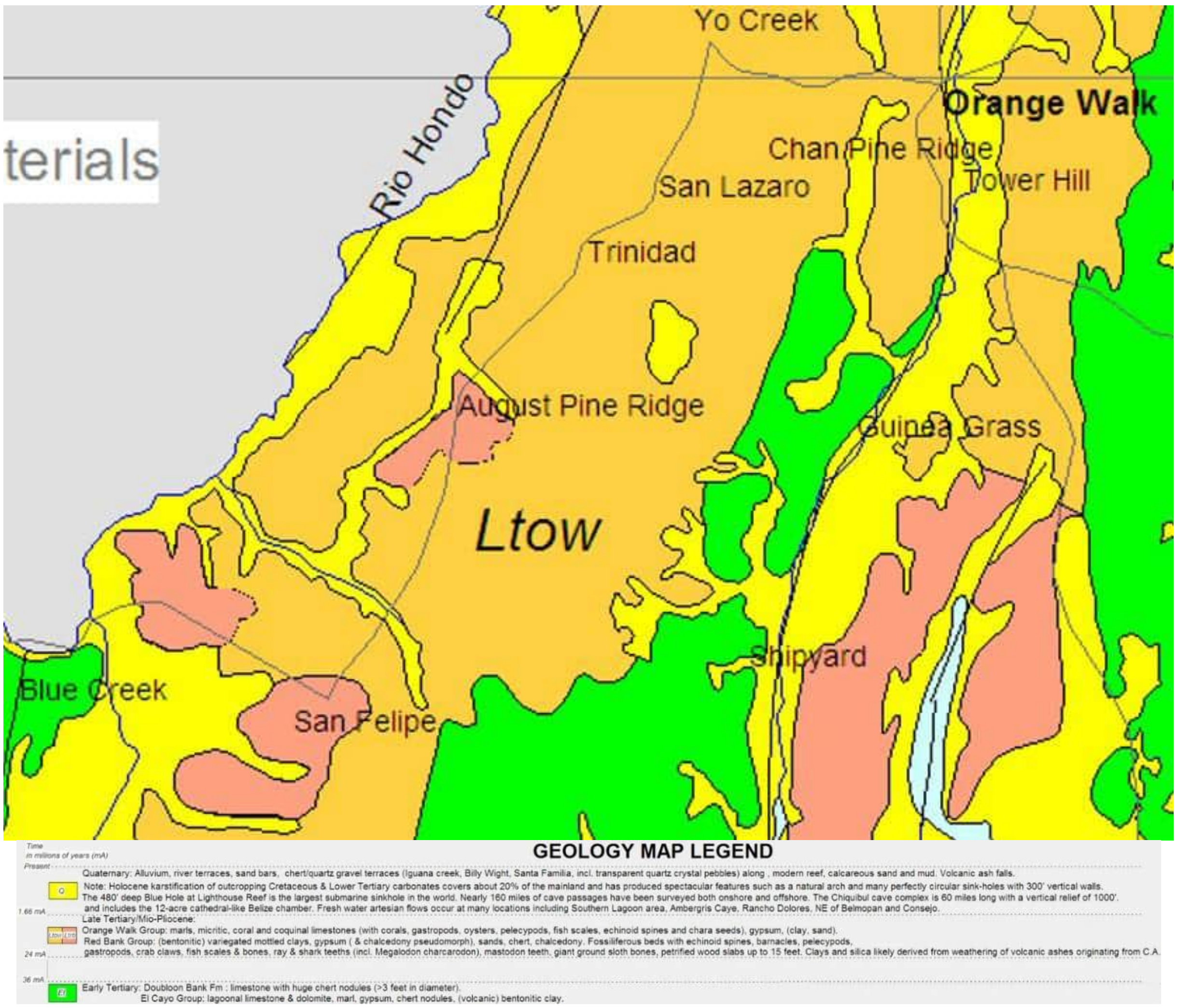



**Figure 2-4. Detail of the geology map of Belize, compiled and interpreted by Jean H. Cornec, with the corresponding legend (2015). Note that the chronology indicated in the legend has been corrected (King and Petruny 2023), and that « Tertiary » is no longer part of the standard geological time scale (Cohen et al. 2013).**

Our surveys and excavations revealed a mainly sandy stratigraphy reaching a maximum depth of just over one meter, resting on a very compact clay layer that is difficult to excavate manually (Lohse et al. 2024). Apart from surface finds, almost all of the archaeological remains were discovered in the sandy strata, with a few artifacts reportedly recovered from the clay layer.

The APR area is well drained. It is crossed by tributaries of the Rio Hondo, just 5 km away, and also has temporary streams, numerous ponds and aguadas, as well as a larger water body called "Cenote Tilletts" (about 5 km north-northwest of the village). Average annual rainfall is 132 cm, occurring mainly between June and November.

According to testimonies gathered from the local community, water was more abundant in the first half of the 20th century, which was one of the factors that encouraged people to settle on this land (Perrot-Minnot 2025b).

APR is located in a lowland savannah ecosystem, and its current natural vegetation is characterized by thickets, grasslands, pine groves, and sparse trees (Goodwin et al. 2013; Hartshorn 1988) (Figure 2-5). The area was once covered by a subtropical pine forest, home to a rich and varied fauna, but this woody vegetation largely disappeared in the second half of the 20th century as a result of human activities including urbanization, road construction, agriculture, livestock farming, pine logging, and sand extraction (Perrot-Minnot 2025b).

**Figure 2-5. Landscape of APR with, in the background, the hills located west of the Rio Hondo. Photo: Sébastien Perrot-Minnot (2024).**

## The Environmental Changes since the Terminal Pleistocene

Over the course of the time periods studied by our project, the regional landscape underwent significant changes. During the terminal Pleistocene, which covers the last few millennia of glaciation and which saw the human species spread across the Americas, the climate in Central America was much colder and drier than it is today, and sea levels were lower, exposing some of the submerged land that now forms the continental shelf (Piperno 2006; Piperno and Pearsall 1998).

According to Dolores Piperno (2006), temperatures on the Central American isthmus were 4 to 7°C lower, and annual rainfall was probably reduced about 30% to 50%. In addition, $CO_2$ concentrations in the atmosphere were much lower, which may have limited forest density (Piperno 2006). On a map by the same author (Piperno 2006:

Figure 1) showing the "reconstructed vegetation of lowland tropical Middle and Central America between 20,000 BP and ca. 10,500 BP," Belize appears covered by "mostly undifferentiated thorn woodland, low scrub, and wooded savanna vegetation" (Figure 2-6). The APR area was certainly very favorable for the settlement of megafauna, although at this time we are not aware of the discovery of Pleistocene animal remains in this part of Belize.

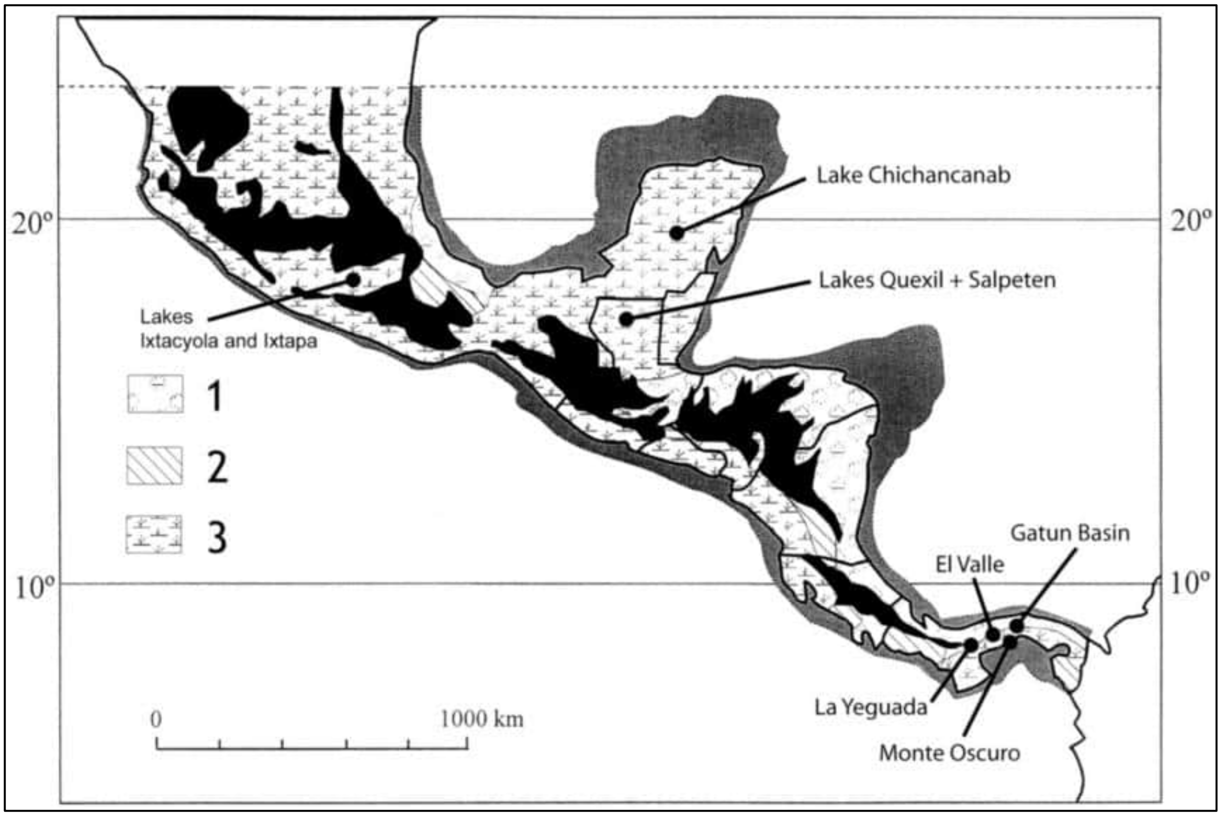



**Figure 2-6. Map showing the location of paleoecological sites with records dating to the Pleistocene and the reconstructed vegetation of lowland tropical Middle and Central America between 20,000 BP and ca. 10,500 BP. 1) Largely unbroken moist forest; 2) Forest containing drier elements that characteristic today; 3) Mostly undifferentiated thorn woodland, low scrub, and wooded savanna vegetation. Taken and cited from Piperno 2006: Figure 1.**

After the period of abrupt cooling known as the Younger Dryas, which took place during the last stage of the late Pleistocene (12,900-11,700 cal BP), the formation of a warmer and wetter climate and the associated gradual rise in sea level (stabilized around 7,000 cal BP) during the early Holocene led to progressive and profound transformations of the environment. Forests expanded and, in areas that have become covered with dense tropical vegetation, the food resources used by humans since the Wisconsin glaciation (and primarily megafauna) inevitably declined (Hillesheim et al. 2005; Piperno 2006, 2011; Piperno and Pearsall 1998; Prufer et al. 2021). The disappearance of much of the megafauna of the Americas between the late Pleistocene and early Holocene is attributed to climatic and ecological changes and/or human hunting (Cortes Faria et al. 2025; Meltzer 2020).

Archaic societies, when they emerged, had to adapt their subsistence strategies by intensifying the hunting of small mammals, fishing, mollusk gathering, and the exploitation of plants. This drawn-out transition is associated with the domestication of plants and the emergence of early horticulture as it spread throughout Middle America during the early Holocene. Agriculture spread unevenly in the different regions, accompanied by forest fires and other modifications of the natural environment, which become especially evident after 5000 cal BP, in the archaeological record (Borejsza 2021; Piperno 2011; Prufer et al. 2021). The adaptation and colonization by human groups became easier after the stabilization of landscapes, around 8000-7000 cal BP (Hillesheim et al. 2005).

In northern Belize, agriculture seems to have appeared relatively late, only around 5000 cal BP, and did not become widespread until a millennium later, by which time maize had become a staple food throughout Mesoamerica (Lohse et al. 2006; Rosenswig 2020). Yet the impact of this activity on the natural environment is still difficult to assess. In any case, as Robert Rosenswig points out, "With no ceramic-using villagers documented until ~1100 BC, all of these human impacts to local vegetation regimes occurred when mobile Archaic-period foragers occupied the region" (Rosenswig 2020:59).

Between 2200 and 1900 BC, the climate became much drier in many different parts of the Northern Hemisphere. In Mesoamerica, this new situation seems to have led to various adaptations in subsistence strategies, depending on the region; these may have included especially the intensification of the production of domesticated plants, the harvesting and processing of drought-resistant grains such as amaranth, and greater exploitation of aquatic resources (Rosenswig 2015; Harrison-Buck et al. 2024). In northern Belize, more precisely in the Crooked Tree wetland, large-scale fish-trapping facilities built by Late Archaic groups have been identified and hypothetically connected with this climatic episode (Harrison-Buck et al. 2024). There, the increased need to fertilize the land and open the landscape is thought to have led to an increase in controlled burning (Harrison-Buck et al. 2024).

## The Implications for the Preceramic Occupations in August Pine Ridge

All this data invites interesting reflections on the preceramic occupations of APR. First, it can be assumed that the Rio Hondo and the New River played key roles in the early colonization of the area. Indeed, a growing body of evidence suggests that the Atlantic coast was a major route of communication for humans in the late Pleistocene, from the southeastern United States to South America (Pearson 2017; Perrot-Minnot 2016), and it is also likely that Paleoindian groups used watercourses for their movements inland (Meltzer 2009:226, 293), traveling on foot along the shores and riverbanks and/or navigating small boats (Engelbrecht and Seyfert 1994; Sutton 2019).

On the lands of APR, these pioneers would have found resources vital for life, primarily water. Near-surface water and associated vegetation would have been suitable not only for human subsistence, but also for a variety of wildlife, which nomadic groups could hunt for food and use the skins and bones to manufacture various objects. Megafauna, probably a priority target in the subsistence strategies of Paleoindian colonizers in Central America (Ranere 2006), may have been abundant in the open savannah landscape. So far, no animal remains have been recovered, and future studies are needed to confirm the makeup of the Pleistocene animal communities of the region.

In addition, across northern Belize are several outcrops of cryptocrystalline (silica-based) stone suitable for making chipped stone tools. Sources include chalcedony deposits in the uplands in northwestern Belize, which were heavily utilized during the Maya period, and high-quality chert such as that found on the Northern Belize Chert-Bearing Zone (NBCBZ), located on the Doubloon Bank formation between the New River and the Caribbean coast (Brouwer Burg and Harrison-Buck 2024; Shafer and Hester 1983). NBCBZ material, defined by characteristic banding, appears at APR in the Fluted Biface Horizon and persists throughout the Archaic, however it is not always predominant in assemblage frequency. We have yet to find or observe any in situ formations or deposits of chert, flint, chalcedony, or similar materials in or around APR itself. Nevertheless, several characteristic raw material sources beyond NBCBZ chert are present among our Paleoindian and even Archaic assemblages, including a distinctive type called APR Purple (Antinossi 2025) that is very common in and helps define our very early assemblages and whose source outcrop is so far unknown.

During the early and middle Holocene, it is reasonable to assume that the exploitation of plant resources increased significantly and that agriculture developed, judging by the stone vessels, grinding tools, mortars, and pestles (Figure 2-7) which are part of our study material (Perrot-Minnot 2024, 2025a). The number of these artifacts is remarkable, given the limited Archaic archaeological inventory available generally from Mesoamerica (Borejsza 2021). It is also worth noting the presence, at APR and in northern Belize in general, of constricted unifaces (Figure 2-8), which are diagnostic of the Late Archaic period; these tools would have been used for clearing land and perhaps even for hoeing the soil (Lohse et al. 2006, 2024; Stemp and Harrison-Buck 2019).

**Figure 2-7. Stone pestles from APR. Photo: Sébastien Perrot-Minnot (2023).**

**Figure 2-8. Constricted adzes from APR. Photo: Jon C. Lohse (2023).**

We do not have conclusive evidence of the practice of fishing at APR in preceramic times, but some barbed projectile points from our corpus of artifacts could have been used for this activity. It is interesting to note that probable pre-Columbian fish-trapping facilities have been revealed by remote sensing data on the Rio Hondo, between Albion Island and Chetumal (Harrison-Buck et al. 2024: fig. 1).

Information relating to the natural advantages of our study area and of northern Belize generally must have spread easily from one nomadic group to another, set benchmarks in the landscape, and sparked meetings and exchanges between people from different backgrounds. In this way, APR was may have been what David Melzter (2009) refers to as a "rendezvous site." As Meltzer (2009:302) writes: "*Such events* [the rendez-vous] *would have been especially important in the Paleoindian era, since groups likely spent much of their time widely scattered in small family bands. From time to time, they must have gathered to exchange information, resources, and mates; initiate adolescents into adulthood; provide proper ceremonial attention to the sick or recently dead; or just enjoy the company of other people.*"

While APR is one of the few known Paleoindian sites in northern Belize, this part of the country has revealed one of the highest concentrations of Archaic sites in Mesoamerica (Brouwer Burg and Harrison-Buck 2024; Lohse et al. 2006; Rosenswig 2015, 2020). It should be noted that the natural advantages we have mentioned for APR are also found elsewhere in northern Belize, with some variations. It can logically be assumed that the subsistence strategies implemented in these territories in the Late Archaic resulted in a significant demographic growth and a strong reduction in population mobility, and perhaps even early sedentism (Harrison-Buck et al. 2024).

In contrast, the absence of known preceramic sites in the neighboring parts of Quintana Roo (Mexico) is surprising (Andrews and Robles Castellanos 2018; Borejsza 2021; Sandra Balanzario, personal communication, 2025). Is it simply due to gaps in archaeological research, or could it be explained at least in part by environmental factors? As we have seen, the landscape west of the Rio Hondo is very different from that observed between this stream and the New River. Much additional research in these areas is warranted, especially considering the well documented corpus of skeletal human remains that has been documented in submerged cave systems and cenotes in northeastern Yucatan dating from approximately 13,500 to about 8000 years ago (Hering et al. 2018; Hubbe et al. 2020; Stinnesbeck et al. 2020). Beyond evidence for the mining of ochre in now-submerged caves in the same region (MacDonald et al. 2020), no material remains has yet been recovered to represent the daily practices or lifeways of these early people.

## Conclusions

In this chapter we have examined the geographical setting of August Pine through geology, relief, hydrography, climate, vegetation and fauna, and have considered the evolution of Central American environments since the terminal Pleistocene. The data collected on these subjects allows us to better understand the exceptional preceramic archaeological record of our study area, which is characterized by an abundant, varied, and in many respects, unique lithic material. It is clear that natural landscapes and resources favored the development of preceramic societies, who found advantages for their movements, substance, industry, creativity and exchanges.

That said, as André Leroi-Gourhan (1945) explained, we must be careful not to exaggerate the influence of the natural environment on culture: humans have preconceived ideas, intentions, they interpret the world in a particular way and make choices. In fact, geographical characteristics similar to those of APR are found in other places on the Yucatan Peninsula, and these locations have not revealed preceramic remains comparable to those in our study area –and sometimes, no remains at all.

Over time, Paleoindian and Archaic groups in northern Belize explored, mastered, and transformed their environment. The changes they imposed on it are still difficult to comprehend, but toward the end of the preceramic era these changes must have been caused mainly by the practice of agriculture during the last two millennia of the Archaic period. Anthropogenic transformation of the environment intensified during the early Middle Formative period, with the emergence of the first villages, the increasing complexity of social organization, and the growth of long-distance trade leading to profound changes in the management of local resources.

For the rest, we must remain very cautious in interpreting the relationship between preceramic groups and their environment at APR. Progress on this topic will, of course, depend on multidisciplinary research: archaeological (through new surveys and excavations, in the hope that undisturbed Paleoindian and Archaic deposits can be excavated and dated), geoarchaeological, paleoenvironmental, biological (considering the analysis of organic residues on ground stone artifacts), and even historical and ethnological. After all, as Leroi-Gourhan stated, archaeology is “the ethnology of the past.”

Special thanks to the colleagues and workers of the Pine Ridge Preceramic Project, to Thomas R. Hester (professor emeritus, The University of Texas at Austin), to Sandra Balanzario (archaeologist, Instituto Nacional de Antropología e Historia, Mexico – INAH Quintana Roo Center), and to the community of APR.

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# Chapter 3. Preceramic Chronology and Technology on the Pine Ridge

**Jon C. Lohse and Mike McBride**

To date, each of the three seasons of our project (2023-2025) has so far contributed important insight into Preceramic use of the Pine Ridge, and our understanding of this dynamic research area continues to evolve. Below are some emerging thoughts concerning chronological and related technological changes, concepts, and terminology that are important for understanding the early record in Belize specifically, and in Central America, generally. The chronological model presented below represents a fundamental revision from earlier schemes, but it incorporates nearly all of the chipped stone technological evidence that is presently available. We acknowledge at the outset that our model lacks direct absolute dates from our study area. Accordingly (and nonetheless), this model is presented as a scheme in need of testing and refinement.

Proposing, refining, and developing a comprehensive chronology for Preceramic culture change in Belize, and Central America, remains an ongoing objective of our work. Fortunately, a great deal of important research in and around our study area has already contributed to an evolving model for Preceramic developments (Iceland 2005; Lohse 2010; Lohse et al. 2006; MacNeish and Nelken-Terner 1983; Prufer et al. 2019, 2021; Stemp et al. 2021; Zeitlin 1984). Much work remains, however, especially with respect to the role of the Central American land bridge in initial Peopling of the Americas (Lohse et al. 2026; Pearson 2017) and the regional emergence of Archaic traditions that led eventually to the mosaic of sedentary societies that defines the Mesoamerican culture area. Presently, several gaps remain in the overall sequence for Belize; the situation is even more pressing elsewhere in the Maya area. Below is a current work-in-progress overview of our efforts in addressing this topic. Not included here is deep consideration about what a Paleoindian period might look like in Central America, or about precisely defined Archaic intervals; thoughts on those topics can be found elsewhere (Lohse 2020a, 2021), will be updated in more detail as our research progresses, and will depend heavily on research advances made by other projects.

One important implication that has emerged from regionalized research efforts across Belize is that differences seem to exist in the Preceramic records of different study areas. That is, cultural variation that is a defining characteristic for Maya-period occupations across the Lowlands appears to have been present in Preceramic times as well (Clark and Cheetham 2002). Early maize, for example, does not seem to have first appeared across the Lowlands at the same time (Lohse et al. 2022). The use of seasonal wetland fish weirs to capture and harvest freshwater resources on a massive scale at Crooked Tree Lagoon (Harrison-Buck et al. 2024) is so far unique in the Maya area but provides an outstanding example of specific ecological niche adaptations that should be expected of an environmentally diverse landscape (Brouwer Burg and Harrison-Buck 2024). More recently, what appears as a cemetery dating to the transition from the very end of the Preceramic to early Middle Formative has been documented at Ceibal, Guatemala (Burham et al. 2025), suggesting that community founding dynamics varied from region to region. These and other examples mean that it is important that projects be conducted with awareness of community, watershed, or landscape-scale considerations or resource variability and how these differences may have influenced local or regional Preceramic occupation records.

For documenting the Preceramic record on the Pine Ridge, our project relies almost entirely on the recovery and understanding of chipped stone tools, including debitage and preform failures related to the manufacture of those tools. Fortunately, what we refer to as our borrowed inventory, those items that have been made available for our study by residents of the village, provides an unparalleled corpus of information about the kinds of complex bifaces and other tools that were made and discarded here. Our emerging regional chronology is a work in progress and is built using different lines of evidence, or in some cases inference, that each comes with its own degree of imprecision. We rely on absolute dating from elsewhere, extended into our area based on stylistic comparisons; technological changes related to the production of complex bifaces and large, hard-hammer percussion flakes and blades; and inferred transitions from one typologically diagnostic tool form to another.

## Late Archaic

Based on excavations at Colha and incorporating some regional developments, Harry Iceland (1997, 2005) defined a chronological scheme for the northern Belize Preceramic. Iceland and others documented a Late Archaic encampment near the margins of Cobweb Swamp and used radiocarbon dates to define what were labeled Early and Late Preceramic periods. The Early facet spans from approximately 1900 to 3400 B.C. What appears as a faint hiatus seems to exist in the Colha sequence from about 1900-1500 B.C., when Iceland's Late Preceramic begins; his Late Preceramic extends to approximately 900 B.C. when ceramic production and associated village habitation were established. Both periods are characterized by a technological system reliant on hard hammer, simple platform macroflake and macroblade production. However, the Late facet is defined primarily by the presence of constricted adzes, which have been closely associated with grubbing and hoeing linked with land clearance and emergent agricultural activities that have been documented around the same time (Pohl et al. 1996). This chronology was important for adding accuracy and precision to earlier work by Richard MacNeish and others (e.g., MacNeish and Nelken-Terner 1983; Zeitlin 1984; see Lohse et al. 2006).

As more sites have been documented and the record from nearby sites has grown, archaeologists have seen that the Colha sequence does not fully capture all regional developments. Our work at APR relies on this work but uses the term "Preceramic" to refer to *all* of the period prior to the emergence of ceramic technology. In our emerging scheme (Figure 3-1), we extend the period during which constricted adzes appear to have been used to approximately 2500 B.C. (ca. 4500 cal BP) based on the recovery of a bifacially flaked specimen from the Actun Halal rockshelter in western Belize (Lohse 2010). In our model, this period corresponds with the widespread appearance of domesticated maize (Lohse et al. 2022) and marks the beginning of the Late Archaic. Climatically, it is also correlated with a widespread dry interval that is recognized globally (Booth et al. 2005) and that has been documented in Petén, Guatemala (Mueller et al. 2009). The regionalized expression of this event is complex and, ironically, appears to have been associated with localized precipitation increases east of the Maya Mountains (Duarte et al. 2021).

## Middle Archaic

At present, we refer to the period before 4500 cal BP as the Middle Archaic but leave much of it undescribed and awaiting future research. Iceland (2005; Wilson et al. 1998) described macroblades, many of which are pointed or unifacially trimmed, dating to between about 4500-6000 years ago. This technological "system" also appears in the Greater Antilles at about the same time, giving support to the suggestion that early settlers there may have originated from mainland Yucatan, specifically northern Belize (Wilson et al. 1998). Kennett et al. (2022) describe aDNA evidence for south-to-north migrations from lower Central America and northern South America into southern Belize, and isotopic evidence for maize consumption by early farmers there as early as ~5600 years ago. However, with respect to stone tool traditions beyond this microblade (and presumably macroflake) technology, little is known

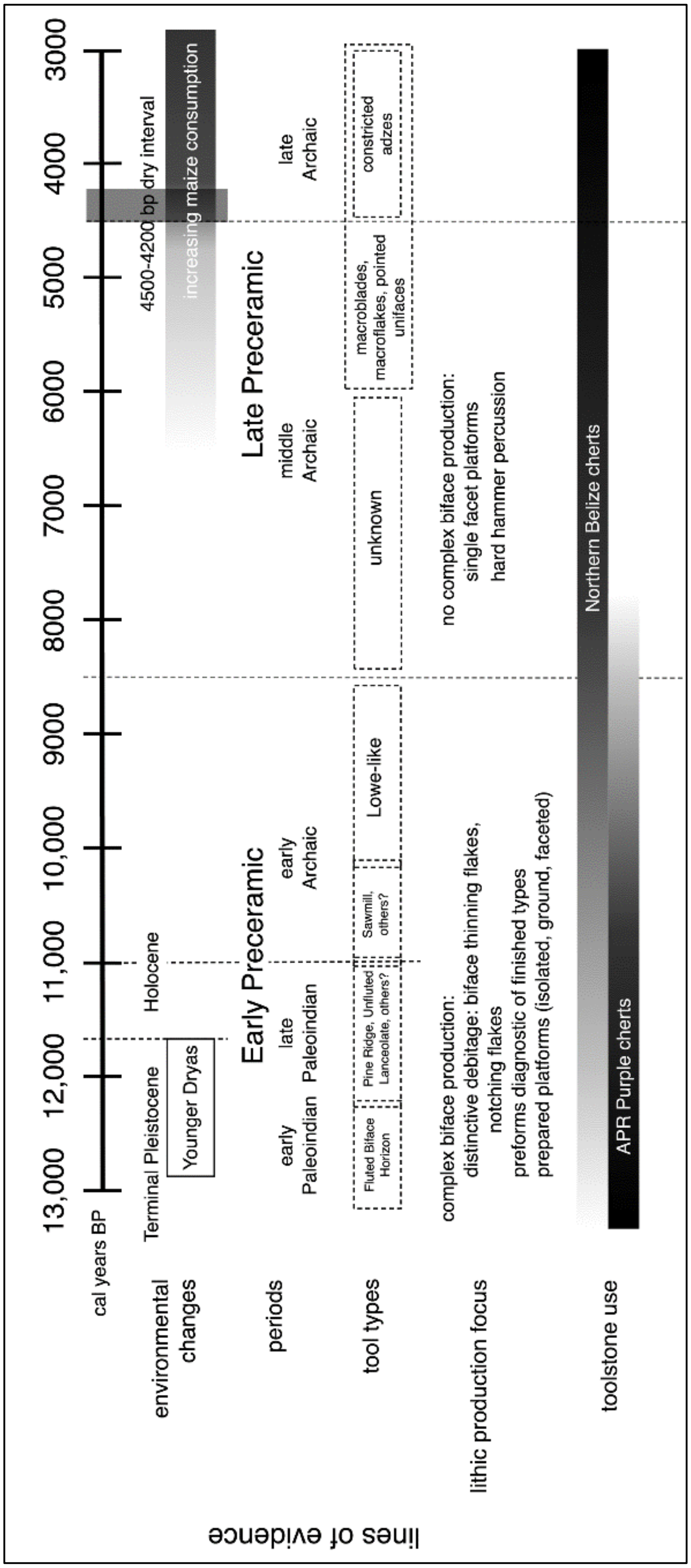


**Figure 3-1. Provisional chronological model for regionalized Preceramic culture change at APR, Belize. Dashed lines everywhere mean that archaeologists are not completely certain about the temporal placement of these units.**

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## Early Paleoindian: Fluted Biface Horizon (FBH)

At the other end of the Preceramic era, we rely on age controls proposed for Clovis and Clovis-influences (~13,050-12,750 cal BP; Waters et al. 2020; Waters and Stafford 2007) and Fishtail varieties (12,900-12,100 cal BP; Waters et al. 2015) from North and South America, respectively, to provide the approximate ages for the Early Paleoindian part of our record. Both Clovis and Fishtail specimens as well as technologically diagnostic remains from the manufacture of these complex biface forms are abundant at APR. Although direct dates for the FBH are not yet available, the technological approaches to the manufacture of each "type" are distinctive enough (Bradley et al. 2010; Suárez and Bradley 2025) that we are confident about extending associated chronologies into our study area. This period was clearly part of the rapid expansion of Clovis- and Fishtail-related culture bearers for reasons that have yet to be documented archaeologically. Nonetheless, the appearance of Clovis technological traits as far south (at least) as Venezuela and of Fishtail technologies spanning from the southern cone of South America as far north as Los Grifos rockshelter in Chiapas (Santa María and García-Bárcena 1987) make this "event" (or process) truly hemispheric in scale. Reasons for this widespread occurrence aside, from a technological perspective the predominant form or "type" of fluted (or at least basally thinned) biface that is present during this interval is what we call Waisted Fluted (see Lohse et al. 2025). Historically, these bifaces have sometimes been referred to as Waisted Clovis (Ranere and Cooke 1991) or even Fishtail (Brown 1980), but like Snarskis (1979), we argue that they do not reflect technologically diagnostic behavior that can be purely ascribed to either complex. Instead, these specimens exhibit a blending of technological approaches that are commonly associated with both. We place all three biface forms into a broad span we call the Fluted Biface Horizon (FBH) from approximately 13,000-12,200 years ago (Kilby et al. 2025; Lohse et al. 2025) (Figure 3-2). We see the abundance of these forms as indicative of the progressive back-and-forth (south-to-north and north-to-south) movements of peoples up and down as they settled into the Central American land bridge starting just prior to the Younger Dryas, ca. 12,900 years ago.

## Late Paleoindian

Making sense of social developments following the FBH from the perspective of stone tool technology is a challenge. Complex biface behaviors beginning sometime prior to the end of the Younger Dryas (around 11,700 years ago) are very poorly dated, and our current impression is that immediately at or perhaps even prior to the end of the FBH, the number of formal "types" that are found here begins to proliferate. The number and diversity of specimens available from APR are extremely important for supporting comparative analyses that will bring understanding to these materials. As a continuation of the social processes we describe for the FBH, the regional influences that these types represent reflects movements from at least as far north as Central Mexico, and from as far south as northern South America. Types named so far from Belize include Unfluted Lanceolate (Lohse et al. 2024c; Valdez et al. 2021), Sawmill (Kelly 1993; Lohse et al. 2006; Stemp et al. 2016), Pine Ridge (McBride and Lohse 2025; Lohse et al. 2024b), Lowe (Kelly 1993; Lohse 2020b; Prufer et al. 2019; Stemp et al. 2016), and Ya'axche' (Stemp and Awe 2013; Stemp et al. 2016). In our view, it is most likely that each of these "types" may actually consist of several related varieties that have yet to be clearly defined. We infer that two related processes were happening simultaneously at this time that contributed to the apparent complexity of the social landscape: 1) regional populations were establishing themselves as early as the beginning of the Younger Dryas, about 12,900 years ago, and 2) emerging technological traditions (derived from continental horizons like the FBH) associated with these regionalized populations each began undergoing their own developmental trajectories, leading in short order to multiple series of complex biface forms. In other words, understanding post-FBH technologies requires archaeologists to evaluate the possibility for both regionalization and change within newly established traditions.

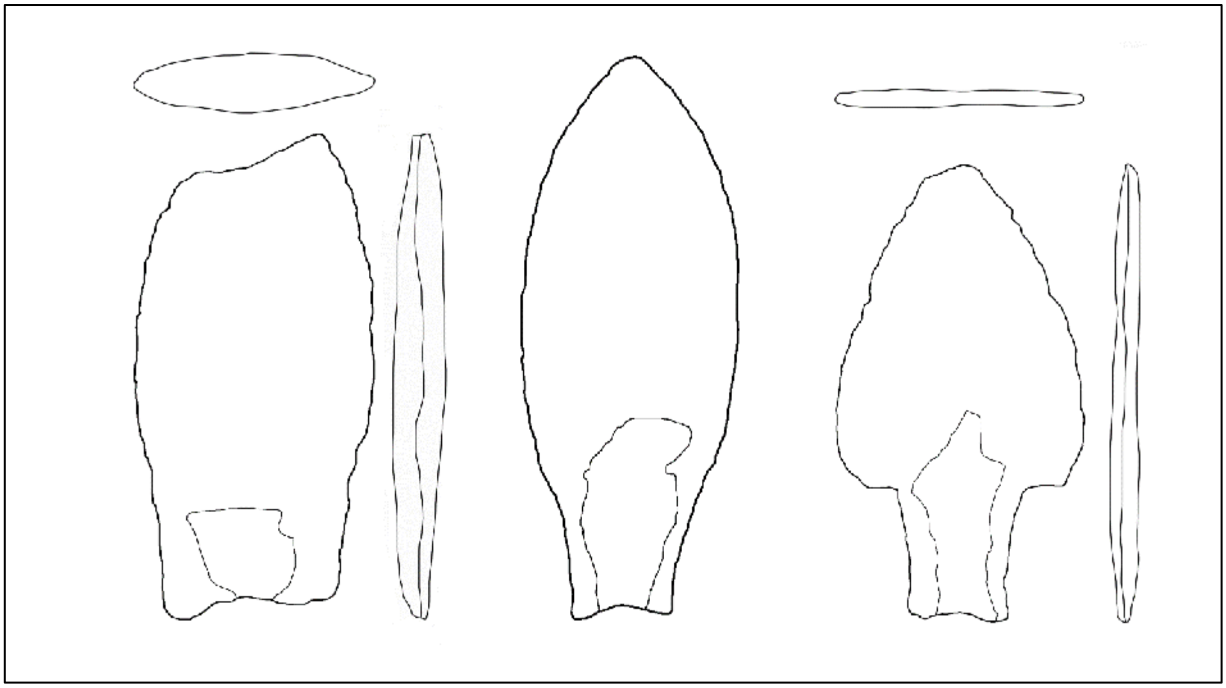

**Figure 3-2. Outlines of three "types" or categories that define the Fluted Biface Horizon: Clovis (left), Waisted Fluted (middle), and Fishtail (right) found in Belize.**

An example of the kind of important, well-dated regionally defined cultural variation that we envision comes from the bifurcated stemmed points that have been recovered from Esperanza Phase deposits at the El Gigante rockshelter in Honduras, dated to between 11,100-9500 years ago (Iceland and Hirth 2021). So far, none of the other complex biface assemblages or proposed types from nearby regions resemble those materials, which are among the earliest well-dated complex bifaces so far reported from Central America. Given the fluidity evident in the technological record at this time, ascribing fixed dates to chronological transitions like Early to Late Paleoindian, or Late Paleoindian to Early Archaic is somewhat of a challenge. Elsewhere (Lohse 2020a, 2020b, 2021) we have argued for earlier dates for the emergence of an Archaic tradition than has commonly been accepted, placing the onset of this transition as early as around 12,000 years ago. Figure 3-1 suggests a date of about 11,000 years ago, but this date should be considered the last possible time by which a fully Archaic adaptation had appeared, a process that undoubtedly began several hundred years earlier, by the beginning of the Holocene.

## Pine Ridge Bifaces

Based on apparent changes in design, morphology, and technology, we include Unfluted Lanceolate and Pine Ridge types in our Late Paleoindian period (Figure 3-3). Working backwards, based on technological affinities, undated Sawmill points are hypothesized as immediately pre-dating Lowe (Lohse et al. 2024a) and may have emerged from what we call Variety 2 of Pine Ridge bifaces (McBride and Lohse 2025). Specimens similar to Pine Ridge, with contracting, narrow stems and barbed shoulders, are reported from elsewhere in Central and northern South America (Javier Aceituno and Loaiza 2023; Ranere and Cooke 2021) where they are loosely associated with dates around 11,000 years ago. In our comparative studies for both Unfluted Lanceolate, which we liken to the El Riego and Flacco types defined years ago in the Tehuacan Valley by MacNeish et al. (1967), and Pine Ridge, which compares strongly with Paijan varieties from northern South America (Maggard 2015; Maggard and Dillehay 2011), we tentatively assigned very approximate age ranges for these types from around 12,200 to maybe as recently as about 11,000 years ago. Clearly, much additional dating work is needed to resolve these tentative chronologies.

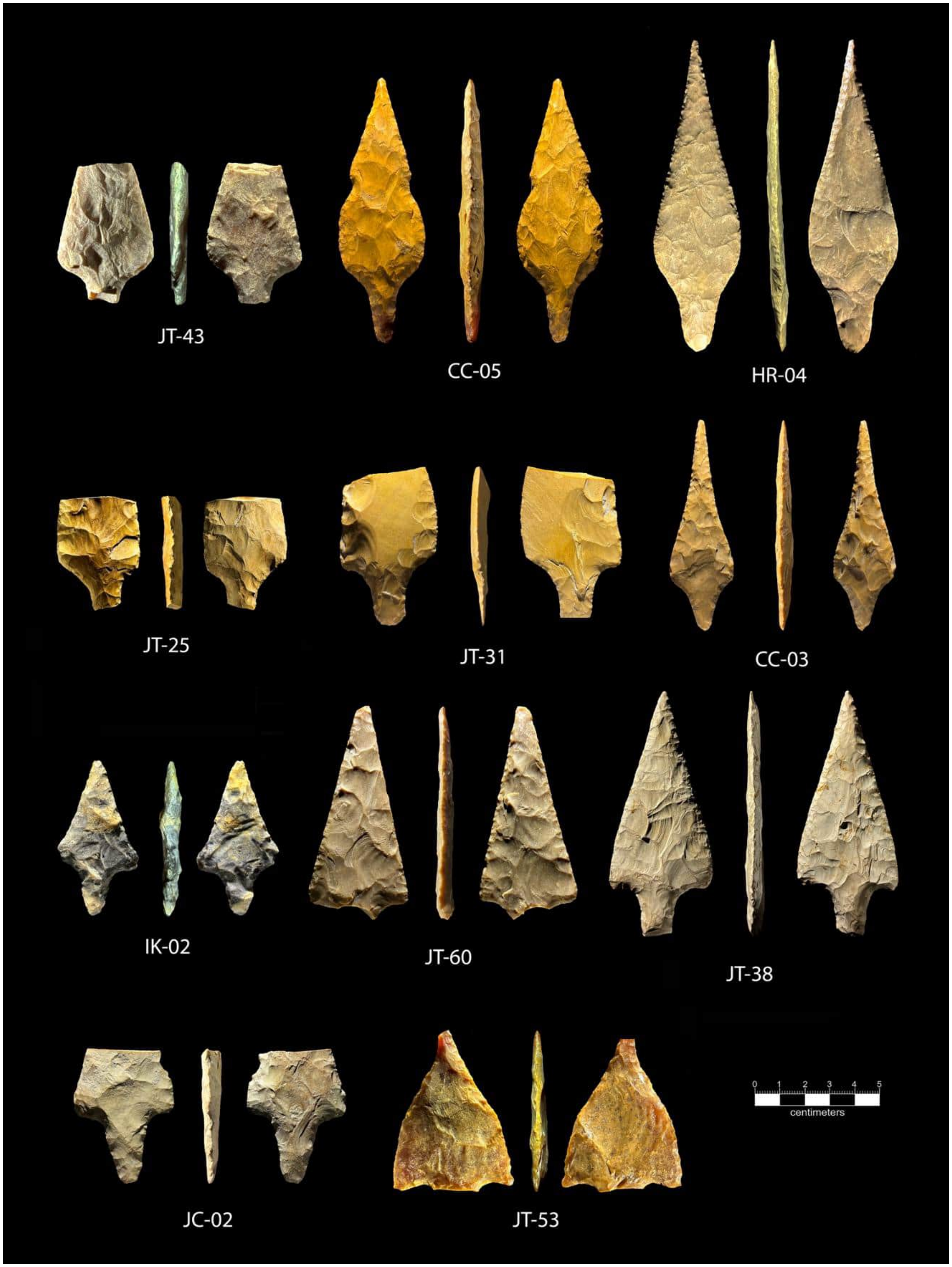


**Figure 3-3. Pine Ridge bifaces from APR. Variety 1 specimens are included on the top two rows. Variety 2 specimens are shown on rows 3 and 4.**

However, if the emerging chronological data hold true, the picture for Central America is one of regionally and even locally defined cultural traditions having appeared by around 11,000 years ago (Prufer et al. 2019; Ranere and Cooke 2021). Technologically, these Late Paleoindian traditions appear to have been well connected between Belize and regions as far south as Venezuela and Colombia and appear to have continued into what we call the Early Archaic. Morphologically, we do not yet recognize any forms or types that may have followed the unfluted lanceolate tradition.

## Early Archaic: Sawmill to Lowe

In our proposed scheme, we classify Sawmill as Early Archaic but acknowledge and recognize that tremendous variability defines this complicated, poorly dated period. We infer the development of Sawmill forms from Pine Ridge bifaces based primarily on morphological changes to shoulder and stem elements (McBride and Lohse 2025). However, some blade elements between the two types also show similarities. Pine Ridge shoulders are rounded (Variety 1) to barbed (Variety 2), and the barbed varieties would easily have become the downturned forms that characterize Sawmill points by slightly changing the notching angle that defines the stem. Based on our sample of Sawmill bifaces from APR, we see that the definitions originally offered by Kelly (1993) and Lohse et al. (2006) are incomplete and do not fully capture the range of variability present in this type. Lohse et al. (2006:217) noted that "Sawmill points are characterized by fine parallel-oblique pressure flaking, occasionally trending into a beveled blade, sharp barbs defined by deep basal or corner notches, and have expanding stems that sometimes retail a false flute." Kelly (1993:216) also observed occasional grinding along the stem margins. In our specimens, we see that parallel-oblique flaking along the margins ranges from absent to well developed. Barbs are down-turned and the degree of basal or corner notching can vary in terms of depth.

What our specimens all have in common, though, is that these notches are consistently rounded rather than sharply angular, and that the notching flakes themselves rarely travel more than a few mm into the mass of the blade (Figure 3-4). Distal blade portions are proportionally slender and even sometimes incurved, similar to many Pine Ridge bifaces. This attribute can be seen on some early to middle-stage preforms as well (Figure 3-5). Sawmill points from APR rarely if ever have beveled blades, which we see as an issue related to how these tools were resharpened during use.

In our proposed Early Archaic sequence, Lowe points follow Sawmill, although the technological connections between these two forms is not necessarily straightforward or clear. Minimally, it involved developments in the notching behavior that defined the stem and barbs, with Lowe representing a clearly defined, aggressive approach to this flaking technique (Figure 3-6). Notching flakes present on most Lowe specimens often travel over a centimeter into the mass of the blade area. Lowe is an important type in our overall Preceramic chronology for two reasons: so far, these bifaces are specific to Belize, and they are reasonably well dated. From carefully controlled rockshelter excavations in Southern Belize, Prufer and colleagues (2019) have ascribed an age range for Lowe points and bifaces of approximately 10,200-9300 cal BP.

When published, these dates represented a major turning point in archaeologists' comprehension of the So far in our work at APR, we have intentionally avoided dealing with Lowe points or variation in much detail. This work will come at a later date, but for now we use this type and its related variants to define the end of the Early Archaic, around 8500 years ago. Lowe-like biface associated with dates of at least 8600 years ago. We (Lohse 2020b) and others (Stemp and Awe 2013) see a tremendous amount of variability within the so-called Lowe category and suggest that this "type" probably includes several varieties that may one day warrant the designation of altogether new type names. Ya'axche' is one possible example; only two examples have been reported so far and both were recovered from the Bladen Nature Preserve in southern Belize (Stemp and Awe 2013). Morphologically, this type is similar to yet differs in important ways from Lowe.

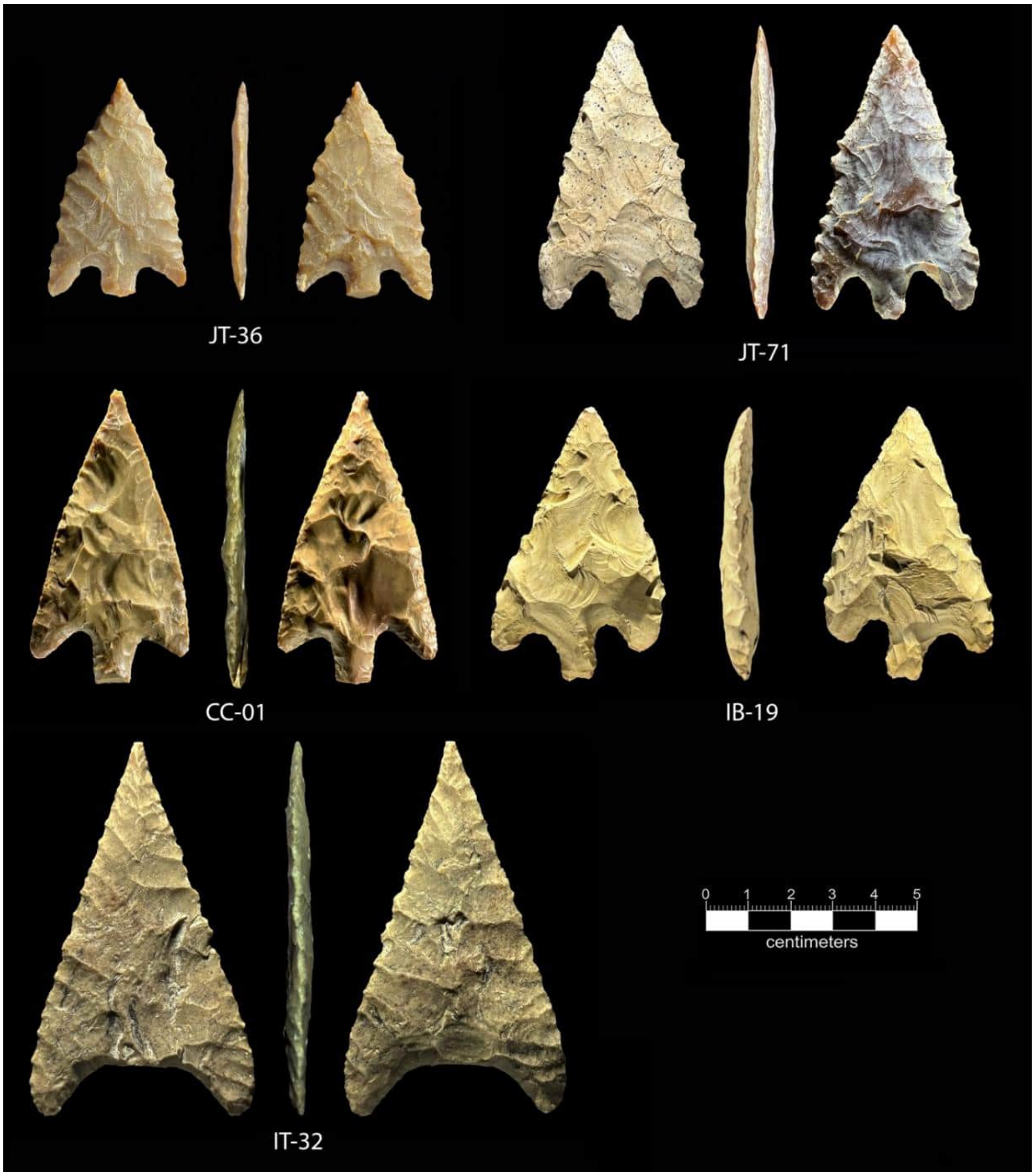


**Figure 3-4. Sawmill points, or bifaces from APR.**

The type represents an intriguing possible example of complex social dynamics that can be regionally circumscribed during a specific time period in the Early Holocene. Lowe and related forms appear to represent the most common Preceramic point or biface “type” and specimens have been recovered from virtually all of Belize. So far in our work at APR, we have intentionally avoided dealing with Lowe points or variation in much detail. This work will come at a later date, but for now we use this type and its related variants to define the end of the Early Archaic, around 8500 years ago.

## End of the Early Preceramic

From their rockshelter excavations, Prufer et al. (2021) have noted that the production of (complex) bifaces, which would include any of the types discussed above, disappears altogether by around 8500 years ago. This date seems to correspond with the end of the “Lowe period,” and establishes that type as the last in a sequence of complex biface forms that were found from the Terminal Pleistocene into the Early Holocene. Debitage assemblages from this time span are characterized and even dominated by biface thinning flakes, often with multi-faceted, isolated, and well-ground platforms. Indeed, investing in platform preparation by isolating, faceting, and grinding was a diagnostic behavior, and when seen in surface or excavated context can be taken as evidence for nearby Early Paleoindian occupations. Following the transition away from complex biface manufacture, regional lithics are defined by flat, relatively unprepared platforms that are commonly associated with hard hammer, macroflake or microblade production (e.g., Wilson et al. 1998).

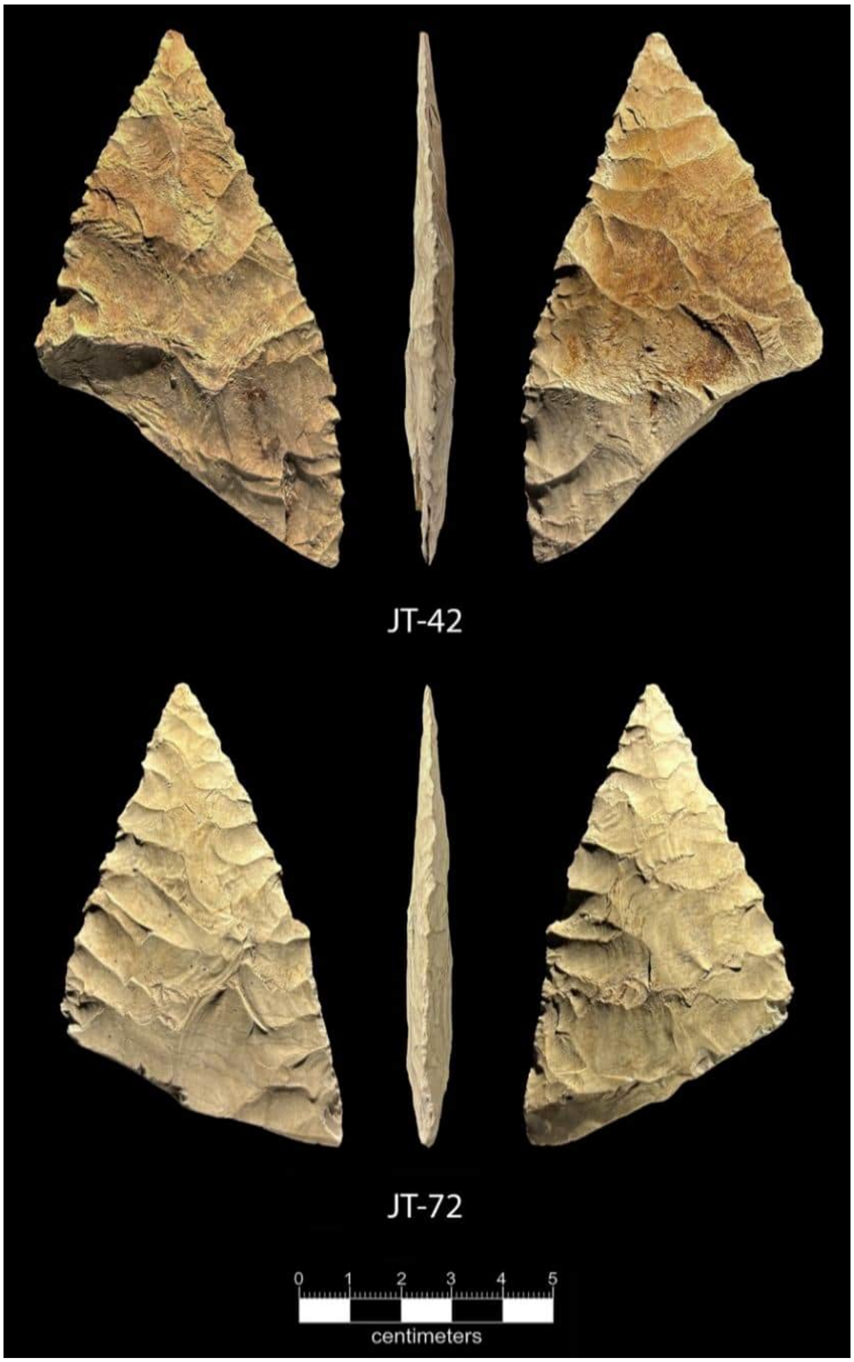


**Figure 3-5. Distal preform fragments associated with the Sawmill type from APR.**

The differences between these two approaches to removing flakes mean that debitage assemblages found in excavation or on the surface and that are not associated with more distinctive or diagnostic tool forms can still be placed into general periods such as "early" and "late" based on the nature of platform preparations and whether they were derived from well-prepared bifaces versus simple-platform cores or crude bifaces. Moreover, it should be theoretically possible to assign approximate age ranges to some unmixed debitage contexts that have distinctive types of flakes, such as notching flakes that would only have come from the aggressively notched varieties of Lowe bifaces. In our emerging Preceramic chronological scheme for northern Belize, we use the transition away from the manufacture of complex bifaces to distinguish an Early from a Late Preceramic period. These terms are intended to expand on and update Iceland's (1997, 2005) terminology (see Figure 3-1) to describe a comprehensive time line of cultural developments around chipped stone tool technological changes from the Terminal Pleistocene to the appearance of settled villages around 3000 years ago.

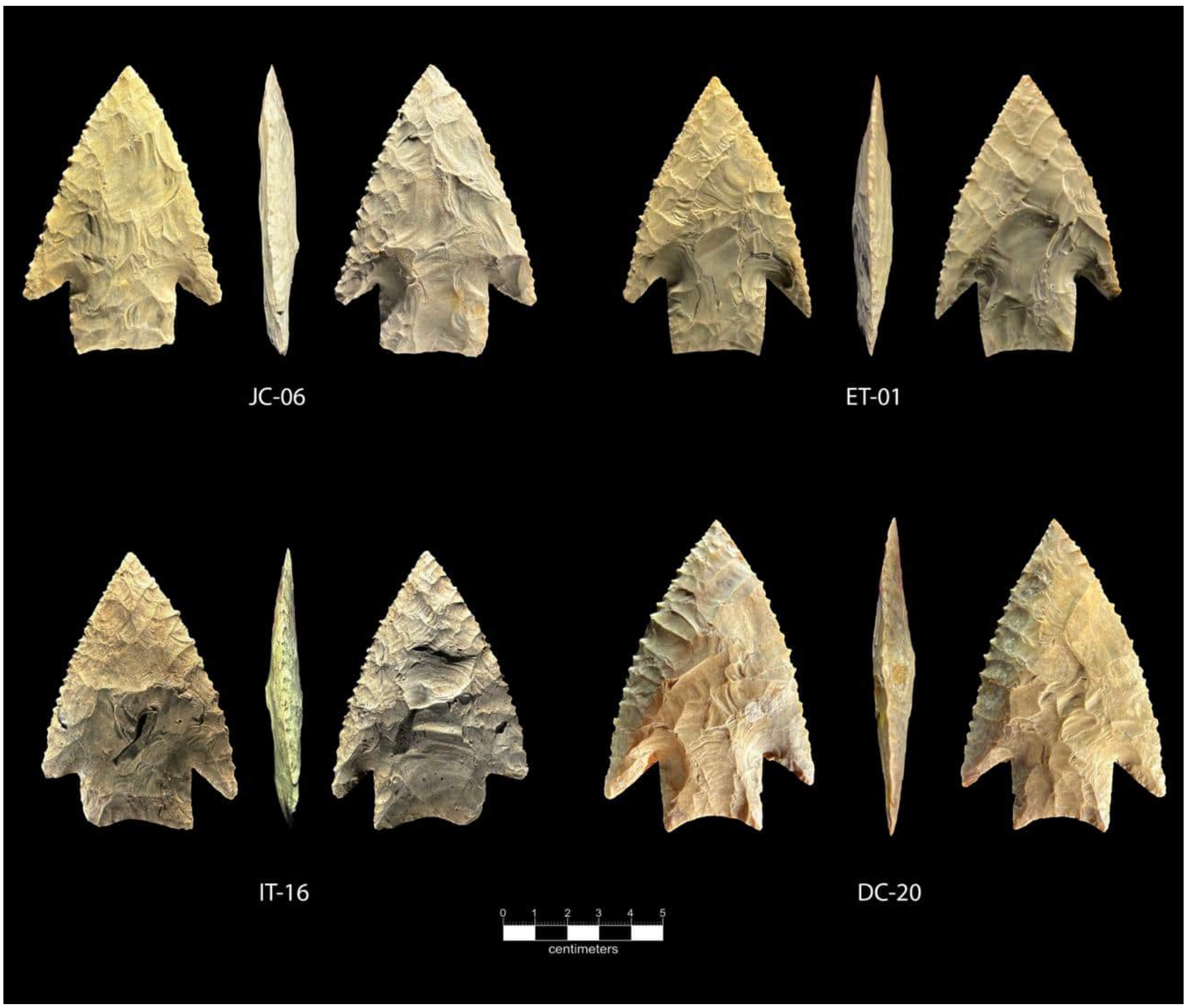


**Figure 3-6. A sample of Lowe points available from APR.**

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# Chapter 4. Summary Contributions of Low-Frequency Multi-Coil Electromagnetic Geophysical Survey to the Study of the August Pine Ridge Archaeological Site (Orange Walk District, Belize)

**Alexis Mojica[1], Ana Beatriz Cosenza Muralles[2], Jon C. Lohse[3], and Sébastien Perrot-Minnot[4]**

**Abstract**

*This work was focused in applying the frequency domain electromagnetic prospecting method to the stratigraphic parameterization of four important sectors at the August Pine Ridge (APR) archaeological site (Orange Walk District, Belize), whose importance lies in the presence of artifacts characteristic of the preceramic periods (Paleoindian and Archaic), typical of Central American prehistory. For this study, a low-frequency multi-coil electromagnetic prospecting device was used to obtain spatial distribution maps of apparent electrical conductivity for six effective depth ranges. In each of the four sectors, different areas of variable surface areas were established, in which parallel profiles separated by 50 cm were developed. In each of the surveyed areas, ranges of apparent electrical conductivity values were identified in accordance with the stratigraphic information reported by the archaeological excavations carried out at the site. Some electrical anomalies were also identified that could be associated with cultural features dating back to a pre-Maya period. Knowledge of the stratigraphy of this site is key to understanding the paleoenvironment.*

**Keywords**: electromagnetic survey, August Pine Ridge, Belize, apparent electrical conductivity, effective depth range, geophysics applied to archaeology, preceramic periods.

## Introduction

Geophysical prospecting techniques are currently presented as alternatives or additional tools having important value in the process of assessing the geoarchaeological potential of a given area (Jeffrey 1986; Clark 1990; Scollar *et al*. 1990; Dabas *et al*. 1998; Milsom 2003). The paleoenvironmental reconstruction of a specific archaeological site is a process that plays a fundamental role in linking cultural features to environmental changes, and this relationship could shed light on the areas occupied by the first settlers. Unlike excavations carried out at archaeological sites to understand their stratigraphy, geophysical prospecting methods can also provide valuable stratigraphic information; in terms of the physical properties being studied, while drilling or excavation is invasive, geophysical testing is not. Application of these non-invasive methods for the characterization of stratigraphic horizons at specific archaeological sites has not been well documented (Dalan and Banerjee 1996; Dalan and Bevan 2002). However, it is possible to identify some geophysical and geotechnical studies focused on understanding the stratigraphic nature of archaeological sites and, related, reconstructing their paleolandscape (Armstrong 2010; Bates y Bates 2000,2016; Verhegge *et al*. 2016).

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Among the most commonly used geophysical methods in archaeological studies are electrical and magnetic methods (Tabbagh 1992). Nevertheless, electromagnetic methods have gained considerable importance in application to archaeology. These methods, which can operate in the time and frequency domains, are based on the physical phenomenon of electromagnetic induction; however, the difference between them lies in how electromagnetic fields are created and measured.

Since the 1960s, electromagnetic techniques have been used in the frequency domain to solve archaeological problems. However, according to Gaffney (2008), these techniques have not been widely used due to limited data collection capabilities, instrument drift, depth of investigation, and researchers' preference for classic methods such as electrical resistivity, magnetometry, and ground-penetrating radar. Nevertheless, thanks to technological advances, devices are now available that have a remarkable capacity to record the apparent electrical conductivity of the subsoil almost continuously along a profile.

According to Bonsall *et al*. (2013), under certain study conditions, the application of low-frequency electromagnetic techniques offers a reasonable approximation of a site's physical properties. The recent technological development of a class of multi-receiver (multi-coil) instruments offers the possibility of exploring the subsoil at different effective depth ranges, suggesting that low-frequency electromagnetic prospecting techniques can play an important role in archaeological studies. The works of Bonsall *et al*. (2013), De Smedt *et al*. (2013), Gaffney *et al*. (2012, 2015), Simon *et al*. (2015), Mojica *et al*. (2023), and Vella *et al*. (2024) demonstrate the success of using this technique in archaeology.

This work was carried out as part of the 2025 season of the Pine Ridge Preceramic Project, with the support of the *DEMETER association* (France), *Terracon Consultants, Inc*. and *Gault School of Archaeological Research*, and the *Universidad Tecnológica de Panamá*. It focused on applying the low-frequency electromagnetic method to evaluate the stratigraphic sequences and archaeological potential of certain sectors of the APR preceramic site, in northern Belize, using a multi-coil device. The aim is to obtain high-resolution spatial distribution maps of the apparent electrical conductivity of the subsoil at different effective depth ranges in four selected sectors.

## The Site

The APR project area is located in the Orange Walk district of northern Belize (Figure 4-1). APR is characterized by evidence of preceramic occupations, according to a set of artefacts that were identified during sand extraction activities (Lohse *et al*. 2024; Lohse *et al*. 2025a, b). Among these artefacts were fluted projectile points, which represent human occupation dating back some 12,000 to 13,000 years (Paleoindian period).

The Pine Ridge Preceramic Project (PRPP) seeks to document a very prolific Paleoindian and Archaic archaeological site area and to provide a legitimate research presence in the area that could lead to the conservation and preservation of elements of these cultural records. Figure 4-2 shows a panoramic photograph of one of the areas discussed in this report (Sector 1).

### Geologic Context

According to Cornec (2015), the APR archaeological site rests on geological elements of the Red Bank Formation (Figure 4-3), which dates back to the late Palaeocene and early Eocene (King and Petruny 2023). The local geology is characterized by the presence of sandstone, which is associated with a turbidite deposit (seafloor formation) that formed and subsequently rose between 23 and 2.5 million years ago. These geological features explain the remarkable amount of natural sand found in the area, which extends across much of northern Belize.

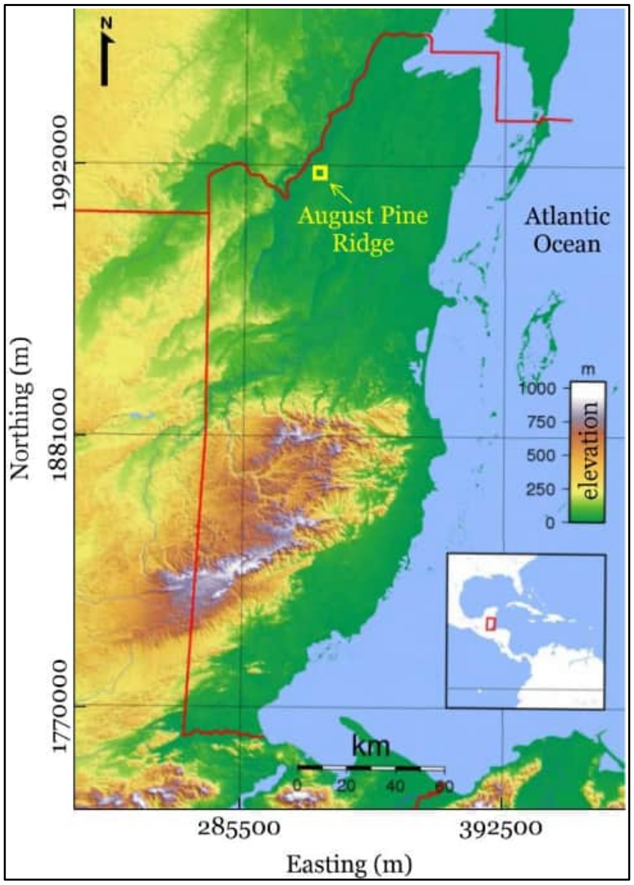


**Figure 4-1. Location of APR in Belize. Modified topographic map by Sadalmek (created with GMT from SRTM data, September 2007).**

**Figure 4-2. Panoramic photograph of Sector 1 at the APR site, Belize.**

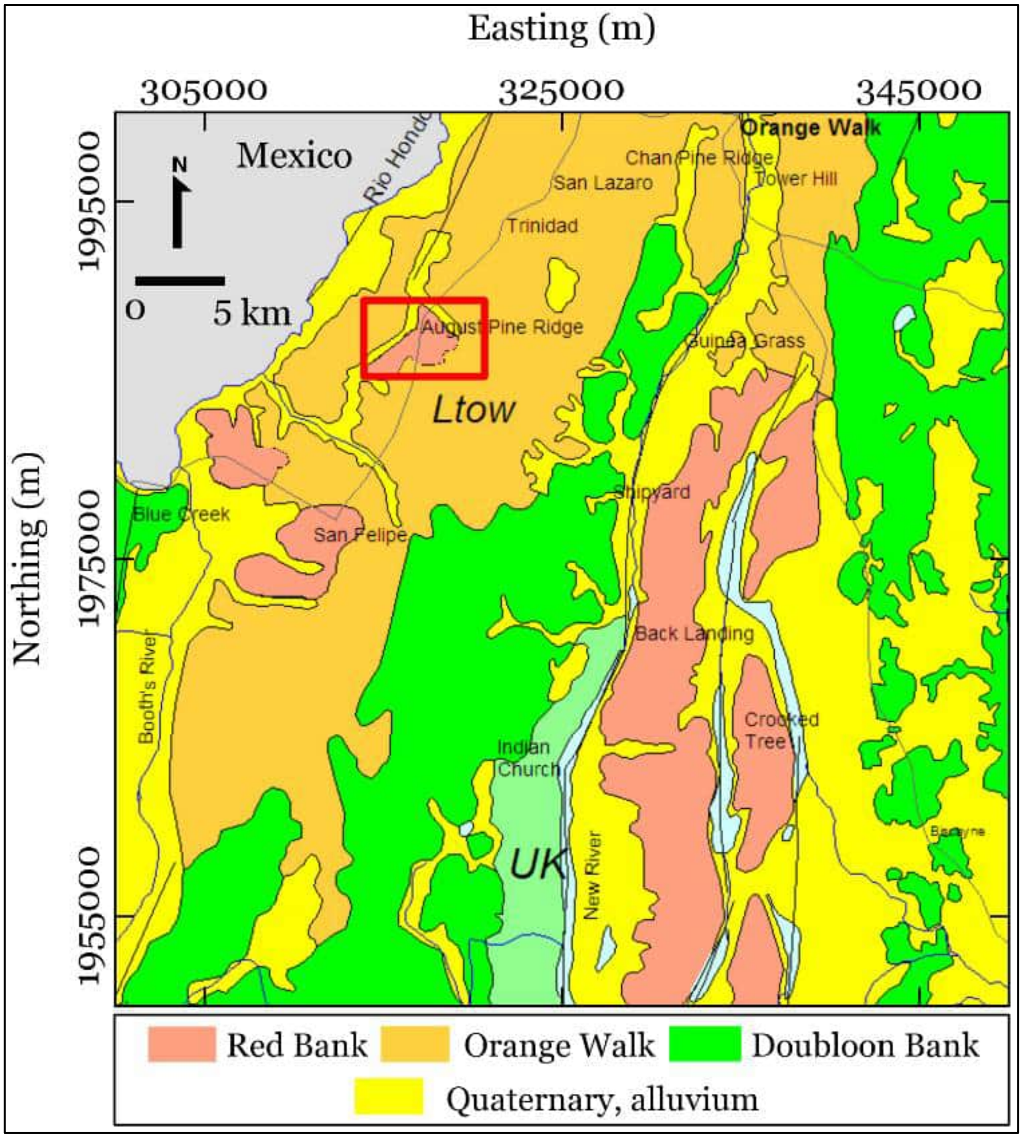


**Figure 4-3. Generalized geological map of the site of interest and surrounding area, modified from the geological map of Belize by J. H. Cornec (2015).**

## Methodology

### CMD Electromagnetic Mapping

A total of four sectors or areas were surveyed using low-frequency electromagnetic prospecting, employing a CMD Mini-Explorer 6L device (GF Instruments). This is a mobile system that operates using an electromagnetic field transmitter coil and six receivers.

The physical principle is based on the phenomenon of electromagnetic induction (Figure 4-4): an alternating sinusoidal electric current is circulated at a given frequency, generating a primary electromagnetic field that propagates freely both on the surface and underground. In the presence of buried conductive material, the magnetic component of the primary electromagnetic field generates induced currents (also known as Eddy currents), which in turn create a secondary magnetic field. This field consists of a magnetic and an electric component, orthogonal to each other, which propagate in a direction perpendicular to the movement of the wave. The secondary and primary magnetic fields are detected by the set of receiving coils. The resulting field differs in both phase and amplitude from the primary field. These differences are transformed into the apparent electrical conductivity of the subsoil. The device used in this study has the capacity to measure this component as it moves along a given alignment (walking transect), without the need for direct contact with the ground.

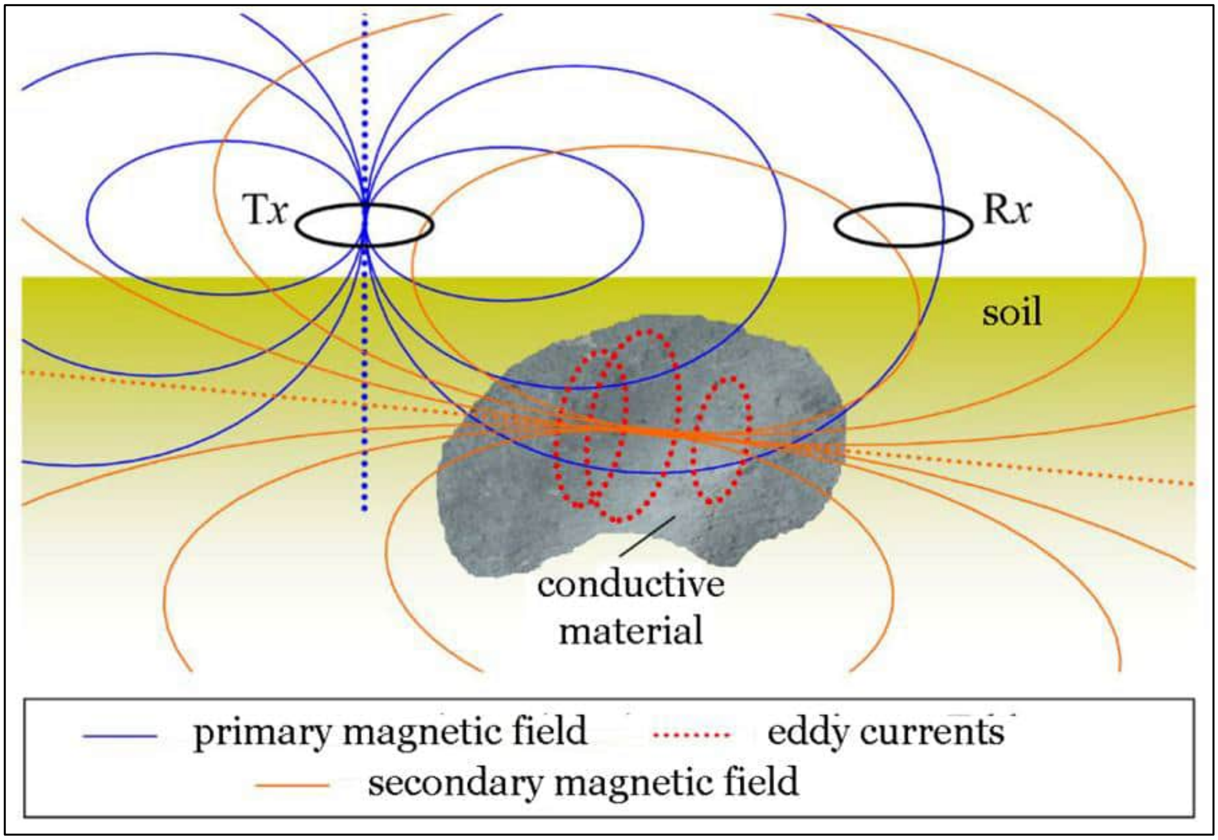


**Figure 4-4. Physical principle of the phenomenon of electromagnetic induction; Tx and Rx correspond to the transmitting and receiving coils, respectively.**

The mobile system consists of a tube containing the coils and that is connected perpendicularly to a handlebar connected to a console via Bluetooth. The console (operated by the operator) allows for geometric and acquisition configuration. In this work, the orientation of the device's dipoles was horizontal (VCP = vertical coil orientation) since this allows effective depth ranges of 15 cm, 25 cm, 40 cm, 50 cm, 80 cm, and 110 cm to be explored. In each of the surveyed sectors, separate profiles were established at a distance of 50 cm, where the device was moved by the operator at an approximately constant speed. Figure 4-5 presents an overview of the device's operation.

Finally, the data can be downloaded in txt format for further processing. In this study, the data were processed using Surfer® 24 software (Golden Software, LLC), employing kriging as the interpolation algorithm. The results are presented through interpolated pixel maps and graphs using color scales whose dynamics, chosen specifically for each map, highlight those electrical conductivity anomalies that could possibly be linked to stratigraphic information and/or possible buried archaeological features. The measured electrical conductivity values assigned to each depth do not represent the conductivity of an isolated point at a given depth, but rather an integration of the effect of the distribution of conductivities from that depth to the surface.

**Figure 4-5. CMD Mini-Explorer 6L device (from GF Instruments) used in the prospecting areas at APR, Belize.**

## 2D Electrical Resistivity Tomography

This technique aims to obtain an image of the spatial distribution of the actual electrical resistivity of the subsoil, both laterally and in depth, from a series of measurements of a certain electrical property that is recorded on the surface. Electrical resistivity (the reciprocal of electrical conductivity) is a physical property of materials that quantifies how much a given volume of soil or rock opposes the passage of electrical currents; this parameter is expressed in ohm meters (ohm.m). Electrical resistivity is an intrinsic characteristic of materials and is one of the most variable parameters in nature; the process of measuring it allows the detection of buried geological structures or formations, as these tend to have electrical resistivity values that are widely different from those of their surrounding environment.

The use of an electromagnetic device such as the CMD-MiniExplorer 6L allows the generation of a 2D electrical resistivity tomography when surveying along a given transect. Because this device has six receiver coils, each profile is equivalent to the generation of information at six different depth levels for a dipole-dipole electrical configuration. In electrical resistivity prospecting, this configuration offers a shallow depth of investigation when compared to other configurations. After collecting apparent electrical conductivity data along a transect, the data are transformed into apparent electrical resistivity values in a specific format so that they can be recognized by inversion software. Tomographic information could only be extracted from the first sector surveyed, since the rest of the sites had electrical conductivity values that were too low, resulting in negative apparent conductivity values and, therefore, negative apparent electrical resistivity values, which hinders the 2D inversion process.

The generation of a 2D electrical resistivity tomography consists of obtaining a 2D image of the subsoil in the form of a cross-section, in order to visualize the lateral and vertical variations in the actual resistivity of the subsoil. The process begins by establishing an initial model of the spatial distribution of resistivities, which could be based on electrical resistivity data measured in the field; this initial model is then used to predict a set of synthetic field data (forward modelling) and calculate an RMS error between the synthetic data and the field data. A change in the initial model is then estimated with the aim of minimizing the RMS error. The new modified terrain model is used to calculate new synthetic data and re-estimate the RMS error.

This operation is repeated iteratively until a final model is obtained with a minimum RMS error between the synthetic and measured field data. In this work, ResIPy (Blanchy *et al*. 2020), a free software based on Python API, was used. It should be noted that the success of the use of electrical resistivity tomography in archaeological sites has been recognized globally (Bates and Bates 2000; Cardarelli *et al*. 2006; Kampke 1999; Mojica 2018; Mojica *et al*. 2023; Noel and Xu 1991; Wake *et al*. 2012;).

## Experimental Results

Figure 4-6 shows an aerial image of the spatial distribution of the four surveyed sectors. A specific survey area was established in each sector, except in Sector 1, where two areas were prospected.

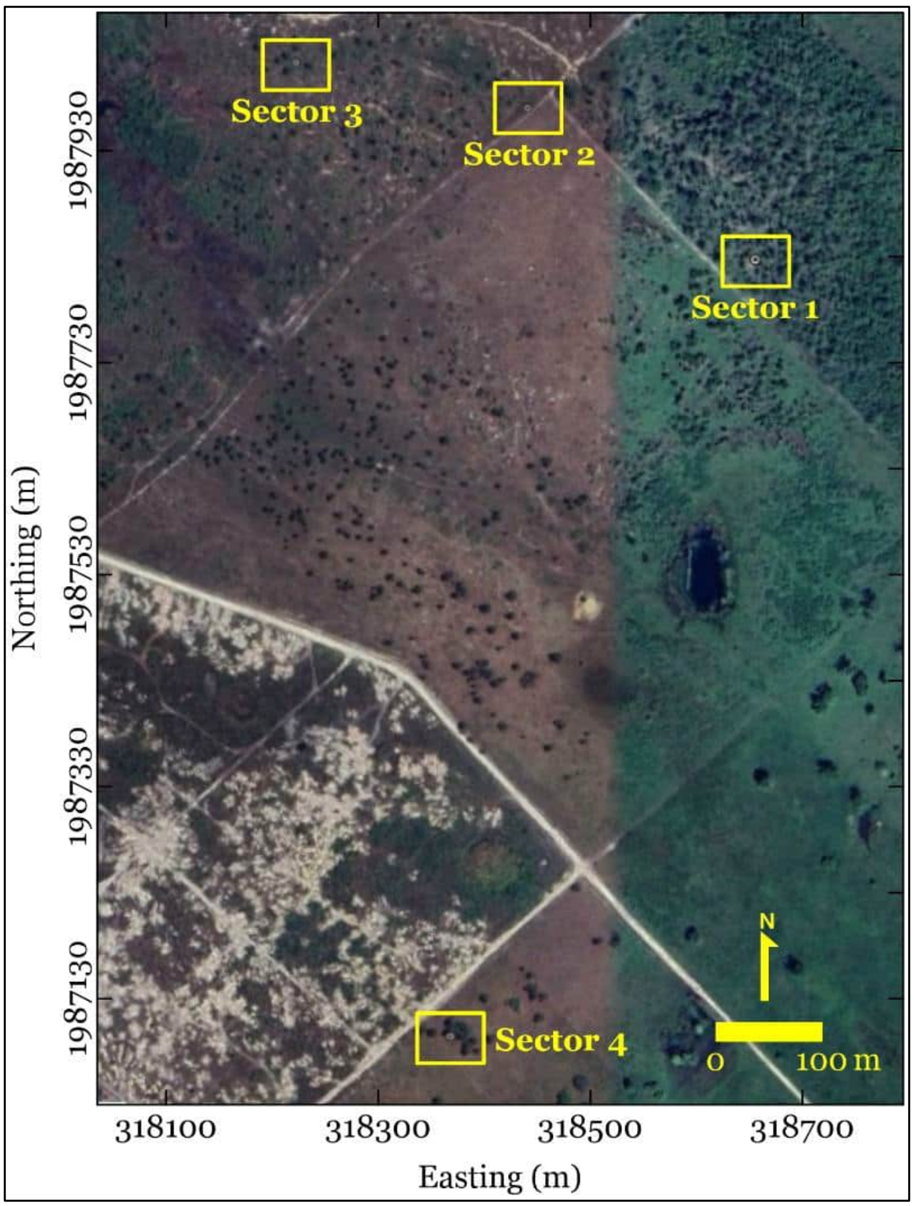


**Figure 4-6. Spatial distribution of the surveyed sectors at the APR archaeological site, Belize.**

## Sector 1

This sector has been named "Monument Valley" due to the presence of an intriguing set of quartzite blocks, the product of a prehispanic arrangement of indeterminate origin and use (Lohse *et al*. 2025a). In the first area surveyed, a polygon was established with four parallel transects 6 m in length and eight additional transects 20 m in length, all separated by a distance of 50 cm. In addition, a 14 m long 2D electrical resistivity tomography survey was conducted. South of this first area, the second surveyed area was identified, where a 6×10 $m^2$ surface was defined. In this area, a total of 13 transects, each 10 m long, were established 50 cm apart.

Figure 4-7 shows the spatial distribution of these two areas represented by the yellow polygons and the profile where the electrical resistivity tomography was developed (red line). The result of the interpolation process of the apparent electrical conductivity data obtained in this first area of Sector 1 (located to the north – Figure 4-7) is presented in the maps in Figure 4-8. The total range that characterizes these maps extends from -2.8 to 5.6 *m*S/m, and then the interpretations of these initial results.

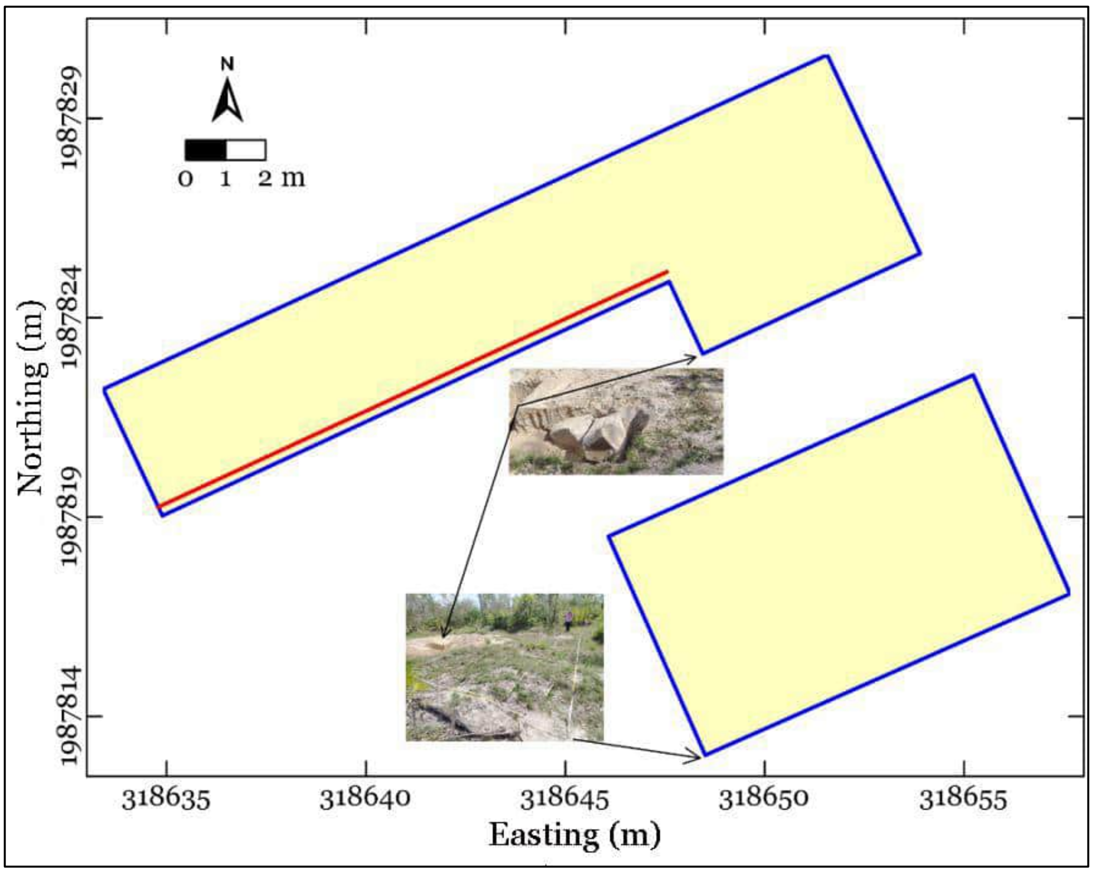


**Figure 4-7. Spatial projection in UTM coordinates of the two areas surveyed in Sector 1. The blue polygon and light-yellow background represents the electromagnetic mapping area, and the red line represents the electrical resistivity tomography extracted at the site.**

The maps obtained in the effective depth ranges ($\Delta z$) of 15 and 25 cm are similar, as they show electrical conductivity anomalies in tones of blue and light blue across much of the surveyed area. These anomalies have very low apparent electrical conductivity values (< -0.4 *m*S/m); this result is consistent with Lohse *et al*., (2024) and Lohse *et al*., (2025a, b), which reports a surface horizon composed of sandy material rich in organic matter followed by an eluvial layer of fine sand (layers A and E in Lohse *et al.* 2024:fig. 1-4). These first two maps also show a punctual anomaly in the southeastern part in yellow and red tones, with apparent electrical conductivity values reaching 1.8 *m*S/m (see arrows and rock notation). This anomaly appears to be associated with a rock identified during an excavation carried out in 2024 (see top photo in Figure 4-7).

- The apparent electrical conductivity map obtained in the effective depth range (Δ*z*) of 40 cm shows a change in tones when compared to the first two maps mentioned above. The range of apparent electrical conductivity values increases from 3.2 to 4.2 *m*S/m, which is consistent with the excavations carried out in the vicinity of the area where a horizon composed of organic matter, aluminium, and iron was identified, according to Lohse *et al.* (2024) and Lohse *et al*. (2025a, b).
- The maps obtained in the effective depth ranges (Δ*z*) of 50 and 80 cm tend to show low apparent electrical conductivity values (1.2 → 2.8 *m*S/m), suggesting the presence of sandy material with accumulations of iron and aluminium. A layer of coarse fine sand resulting from the erosion of the underlying turbiditic sandstone formations is also present in this effective depth range. At the southwestern end of the third, fourth, and fifth maps, there is a point anomaly (circled in red), which was verified through excavation, showing an accumulation of small rocks with no archaeological value.
- Finally, the last map obtained at an effective depth range of 110 cm shows a fairly homogeneous distribution of electrical anomalies; this map presents the widest range of apparent electrical conductivity values (4.8 → 5.6 *m*S/m), which seems to be associated with the presence of clayey material (Lohse *et al.* 2024).

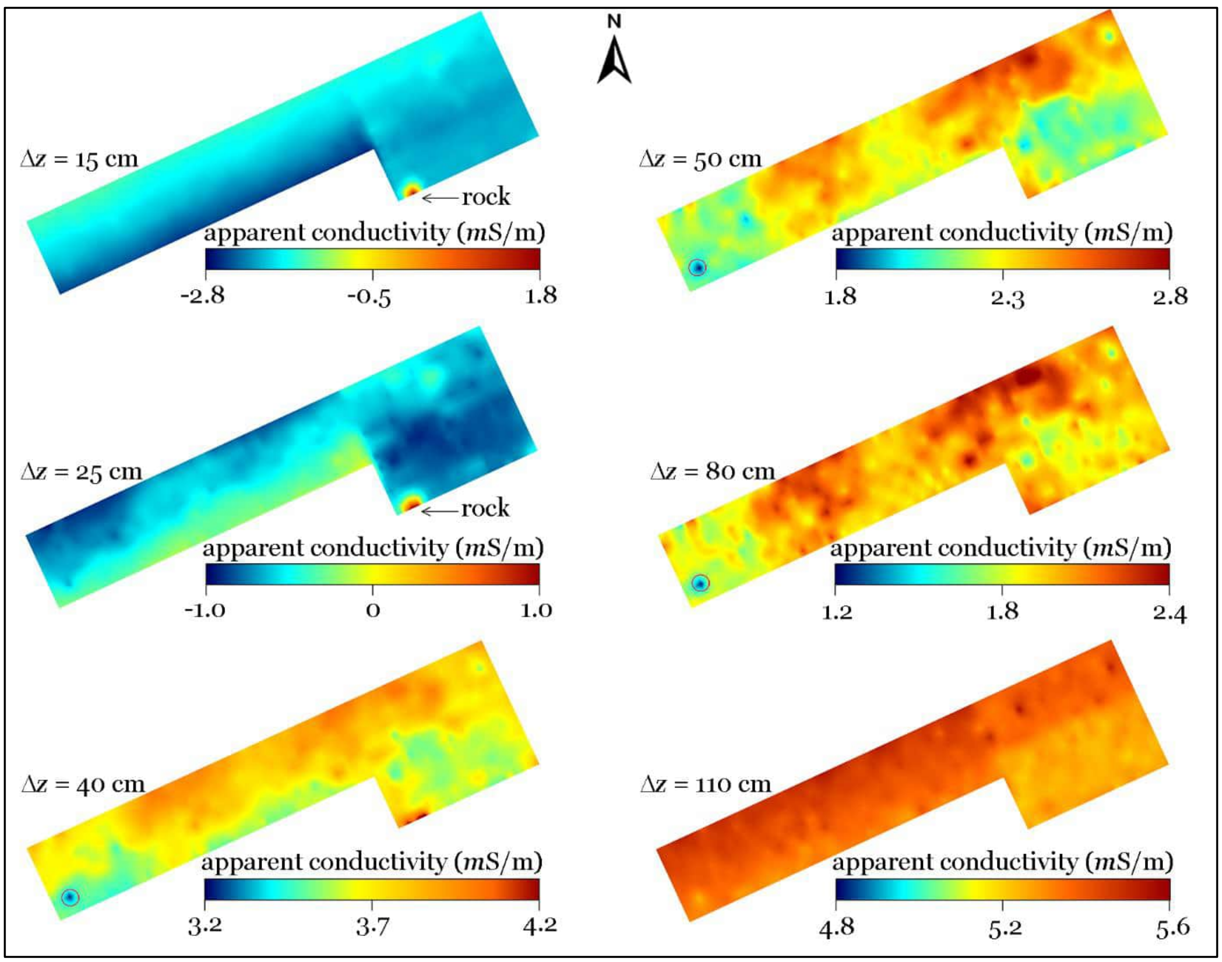


**Figure 4-8. Maps of apparent electrical conductivity obtained on the first surveyed surface of Sector 1 at different effective depth ranges (Δz).**

On the 14 m long transect running northeast-southwest, indicated by the red line in Figure 4-7, a 2D electrical resistivity tomography was obtained for a total of 10 iterations; the RMS error obtained for this iteration was 3.15% and the result is shown in Figure 4-9.

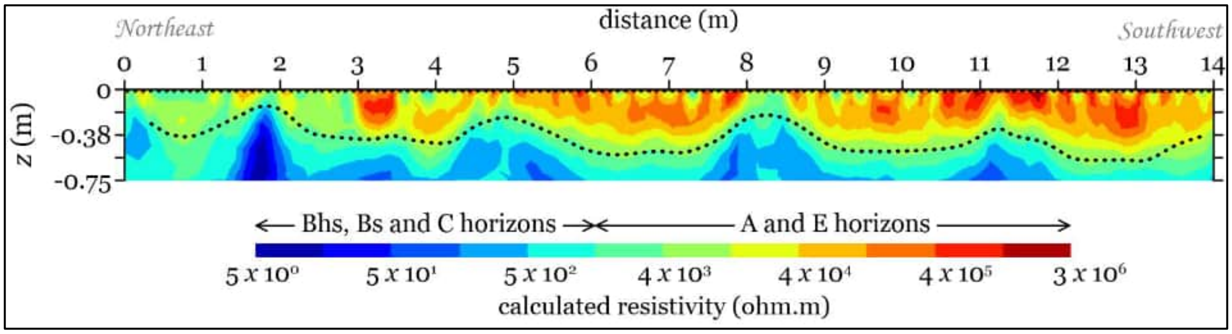


**Figure 4-9. Electrical resistivity tomography obtained on the first surface of Sector 1. The dotted line reveals the approximate boundary between formations A and E, and Bhs, Bs and C according with Lohse et al. (2024).**

For a dipole-dipole configuration, the depth of investigation is not significant; the depth (*z*) obtained by this tomography does not exceed 0.75 m. This result reveals a very resistant horizon in tones of red, yellow and light green, with calculated electrical resistivity values exceeding 1.4 x $10^3$ ohm.m; this horizon appears to contain horizons A and E (according to Lohse *et al.* 2024), which correspond to a surface horizon composed of sandy material rich in organic matter and an eluvial layer of fine sand. Further down, a second horizon can be distinguished, represented in light blue and blue tones, characterized by a range of electrical resistivity values ranging from 5.0 x $10^0$ to 1.4 x $10^3$ ohm.m; it is possible that the decrease in resistivity values is due to the presence of sandy material accompanied by organic matter, aluminium and iron (horizons Bhs, Bs and C in Lohse *et al.* (2024: fig. 1-4)), which causes a decrease in the calculated electrical resistivity value of the subsoil. For the second surveyed area (south of the first), the interpolation of the apparent electrical conductivity values obtained at different effective depth ranges is shown in Figure 4-10.

The interpretations of these results are presented below:

- The first two apparent electrical conductivity maps obtained at effective depth ranges (Δz) of 15 and 25 cm are characterized by slightly similar values of electrical property (between -0.8 and 5 *m*S/m). At this maximum effective depth, the low apparent electrical conductivity values (represented in dark blue, light blue and light green tones) appear to be associated with horizons composed of sandy loam and organic matter, and a fine sandy eluvial soil according to Lohse *et al.* (2024) and Lohse *et al*., (2025a, b). In the western corner of these initial maps, there is a strong electrical conductivity anomaly in red (> 2.1 *m*S/m), which could be associated with a certain accumulation of dense material or possibly rock.
- The electrical conductivity maps obtained at effective depths of 40 and 50 cm show an increase in the parameter (between -3.0 and 7.0 *m*S/m), which could be associated with the presence of a second horizon consisting of organic matter and minerals (iron and aluminium). The strong electrical anomaly in red identified in the northwestern part of the first maps also appears in these results, although to a lesser extent compared to that obtained at an effective depth range of 50 cm.
- The fifth map obtained at an effective depth range of 80 cm shows very low apparent electrical conductivity values (-0.2 and 2.0 *m*S/m), and as in the analysis of the previous area, it is possible that this result is associated with a sandy material (fine to coarse sand, turbiditic sandstone). An approximately homogeneous distribution of electrical anomalies can be seen on this map, although the isolated anomalies seen on this and some of these maps could be associated with the profile effect (prospecting direction and vertical movement of the coils).

Finally, the map obtained at an effective depth range of 110 cm shows high conductivity values, suggesting the presence of clayey material at that depth. The red electrical anomaly identified in the north-western part of the maps has decreased in size.

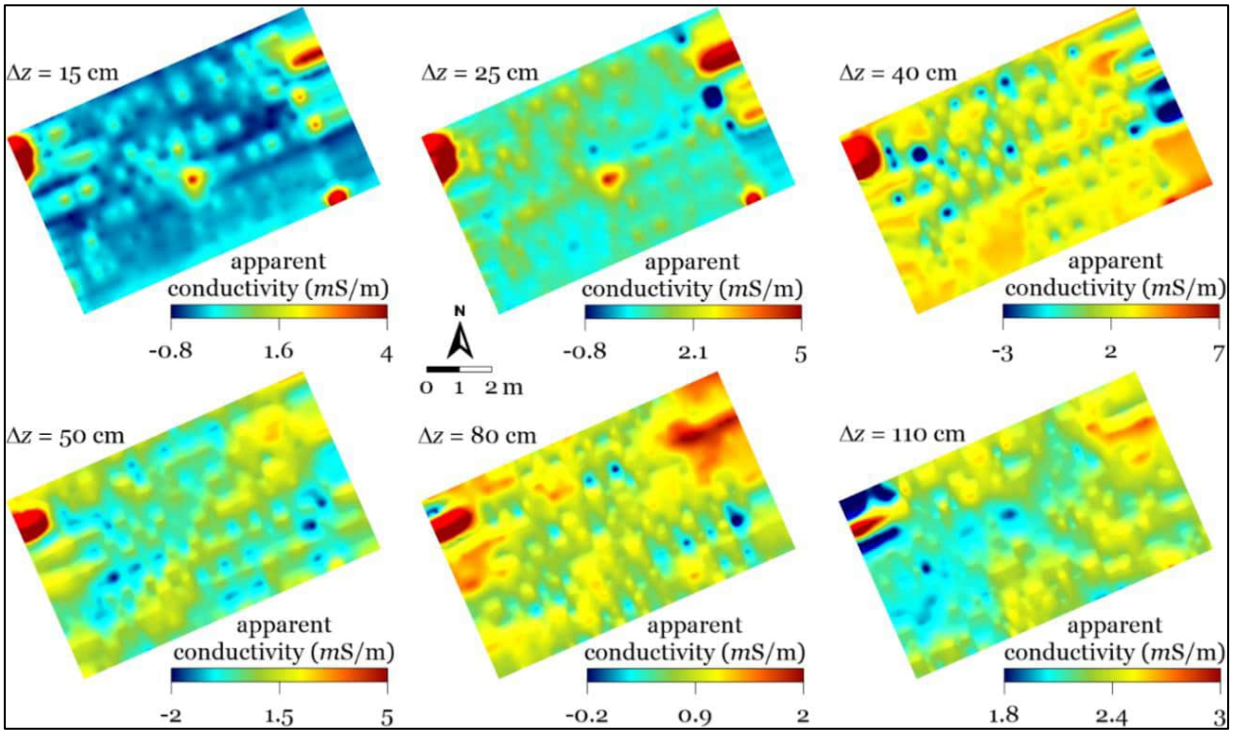


**Figure 4-10. Maps of apparent electrical conductivity obtained on the second surveyed surface of Sector 1 at different effective depth ranges (Δz).**

## Sector 2

This sector is located northwest of the previous one (see Figure 4-6); nine parallel transects 10 m long were established there, with a surveyed area of 4×10 $m^2$. Figure 4-11 shows the area mentioned. The results of the interpolation process of the apparent electrical conductivity data obtained in this second sector are shown in Figure 4-12.

The interpretations of these maps are presented below:

- The maps obtained at effective depths of 15 and 25 cm show the lowest variations in apparent electrical conductivity values (-2.6 → -2.0 *m*S/m), which seems to correspond to sandy material characteristic of the site. Both maps show a dark red anomaly (-2.0 and -1.0 *m*S/m), which could be associated with dense material.
- The third map, obtained at an effective depth range of 40 cm, is characterized by higher apparent electrical conductivity values (3.6 → 5.0 *m*S/m), which could be associated with the presence of a horizon composed of minerals and organic matter, consistent with the excavations carried out in the vicinity of the site Lohse *et al.* (2024) and Lohse *et al*. (2025a, b).

The last three maps, generated at effective depths of 50, 80 and 110 cm, show intermediate ranges of apparent electrical conductivity (between 2.0 and 4.4 *m*S/m), which could be linked to the presence of clayey material and sand. The red anomalies could be associated with the presence of clay at these depths.

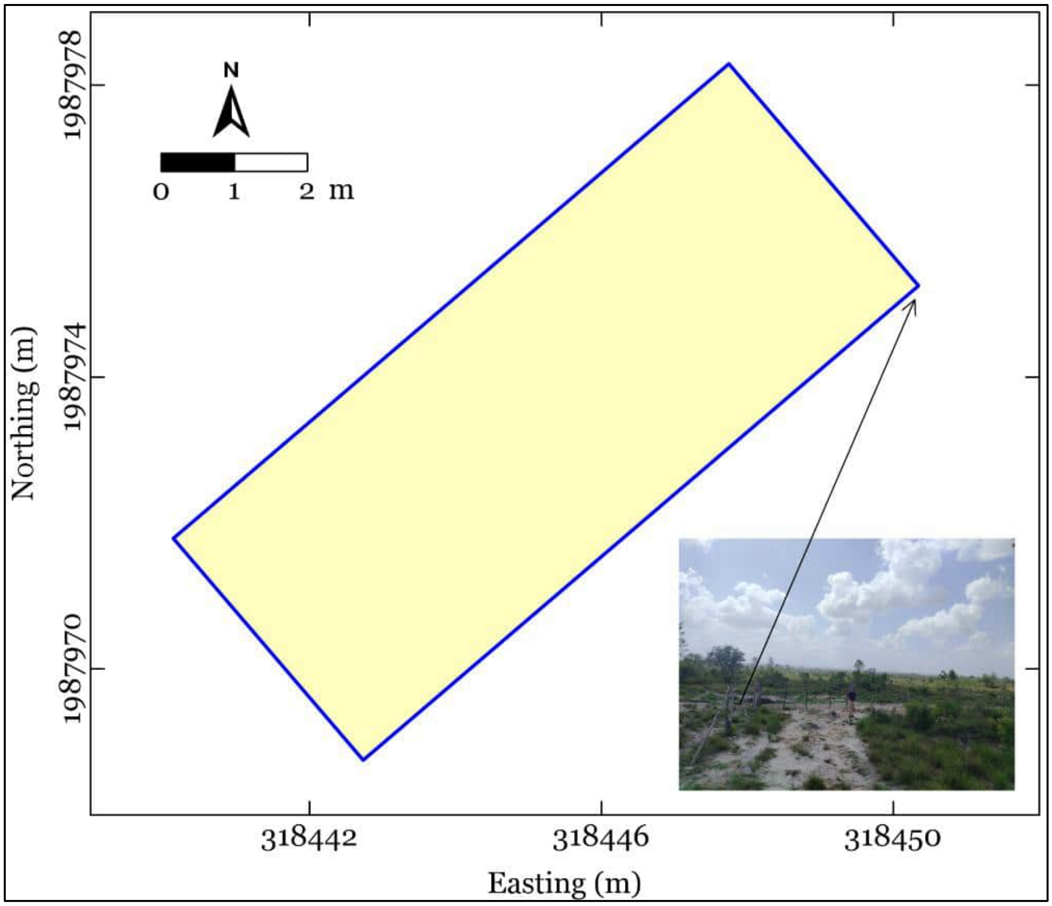


**Figure 4-11. Spatial projection in UTM coordinates of the surveyed area in Sector 2.**

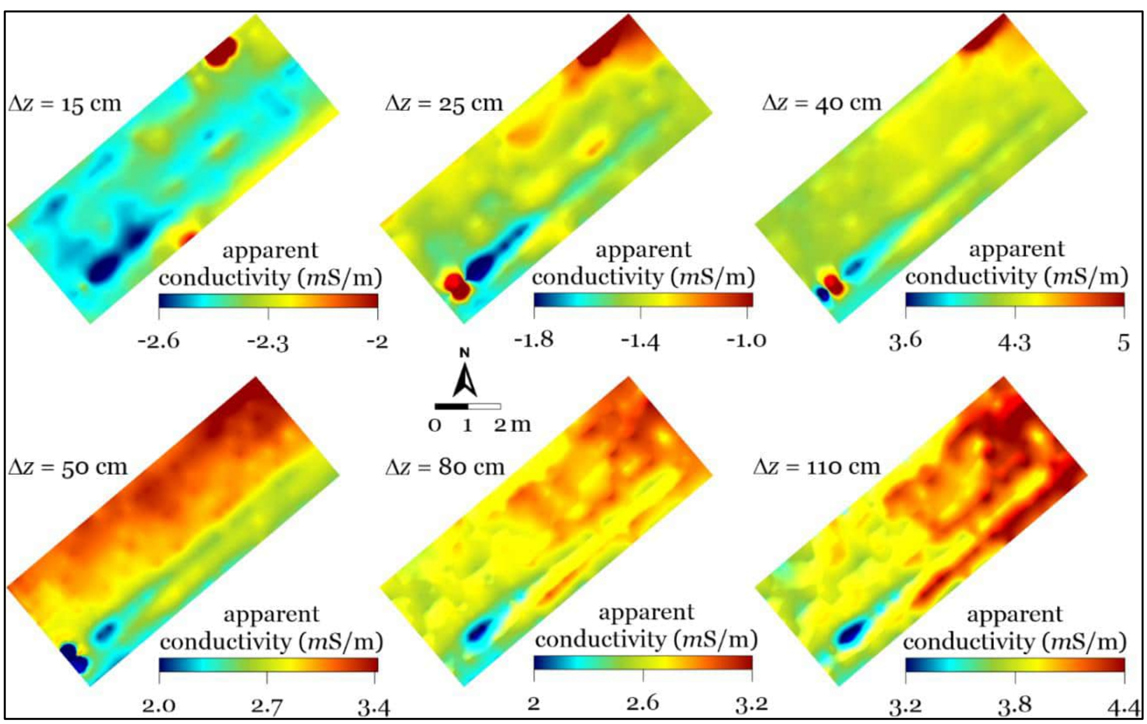


**Figure 4-12. Apparent electrical conductivity maps obtained in Sector 2 at different effective depth ranges (Δz).**

## Sector 3

This sector is located to the northwest of the previous one (see Figure 4-6). A total of seven parallel transects were established, separated by a distance of 50 cm between them and each measuring 11 m in length, resulting in a survey area of 3×11 m². Figure 4-13 shows the distribution of the surveyed area in this third sector.

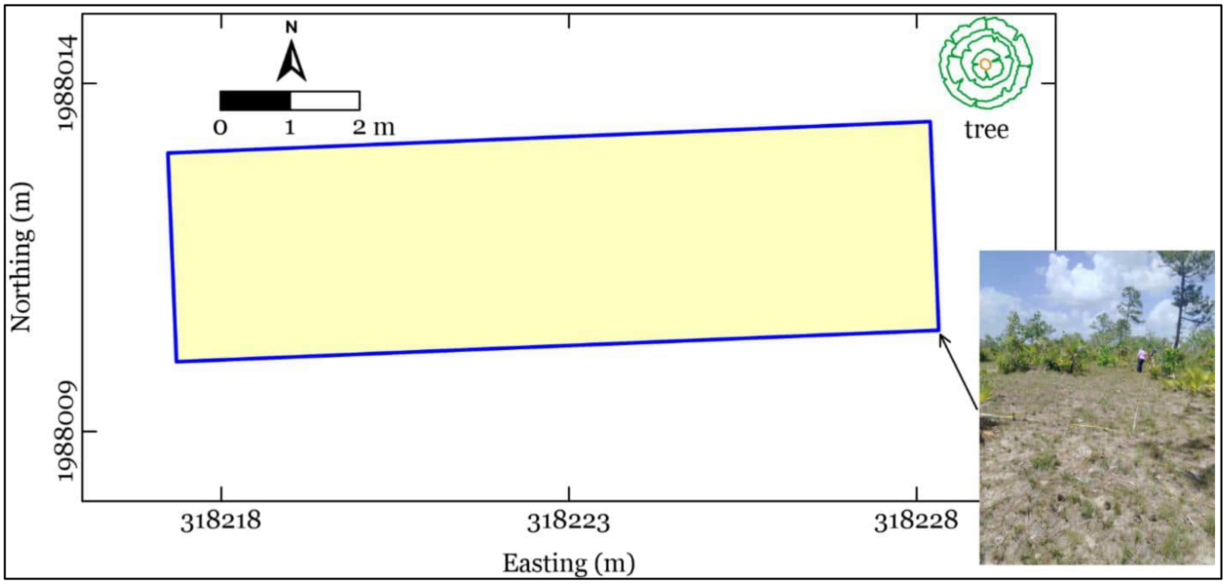


**Figure 4-13. Spatial projection in UTM coordinates of the surveyed area in Sector 3.**

The interpolation of the apparent electrical conductivity data obtained in this third sector is shown in Figure 4-14. Below are the respective interpretations:

- As in the previous results, the first two maps obtained at effective depths of 15 and 25 cm reveal very low apparent electrical conductivity values (<-0.3 *m*S/m), indicating a concentration of sandy material at these depths. However, a dark red anomaly appears in the southeastern part of these maps and in the third map ($\Delta z$ = 40 cm).
- The map generated in the effective depth range of 40 cm shows higher apparent electrical conductivity values (between 4.4 and 5.4 *m*S/m), which could be associated with a second horizon possibly composed of organic matter and minerals, according to the information provided in the excavations. Anomalies with higher values, represented in yellow and red tones, are concentrated in the northern part of the map.
- The maps corresponding to effective depth ranges of 50 and 80 cm reveal lower apparent electrical conductivity values compared to the previous map (between 3 and 4 *m*S/m). This could be associated with the presence of sandy material and clay at these depths; the yellow and red anomalies tend to be concentrated in the northern part of these maps.

The latest map obtained at an effective depth range of 110 cm tends to show a homogeneous distribution in apparent electrical conductivity values, with increasing conductivity. It is possible that this increase is linked to the presence of clayey material at this depth.

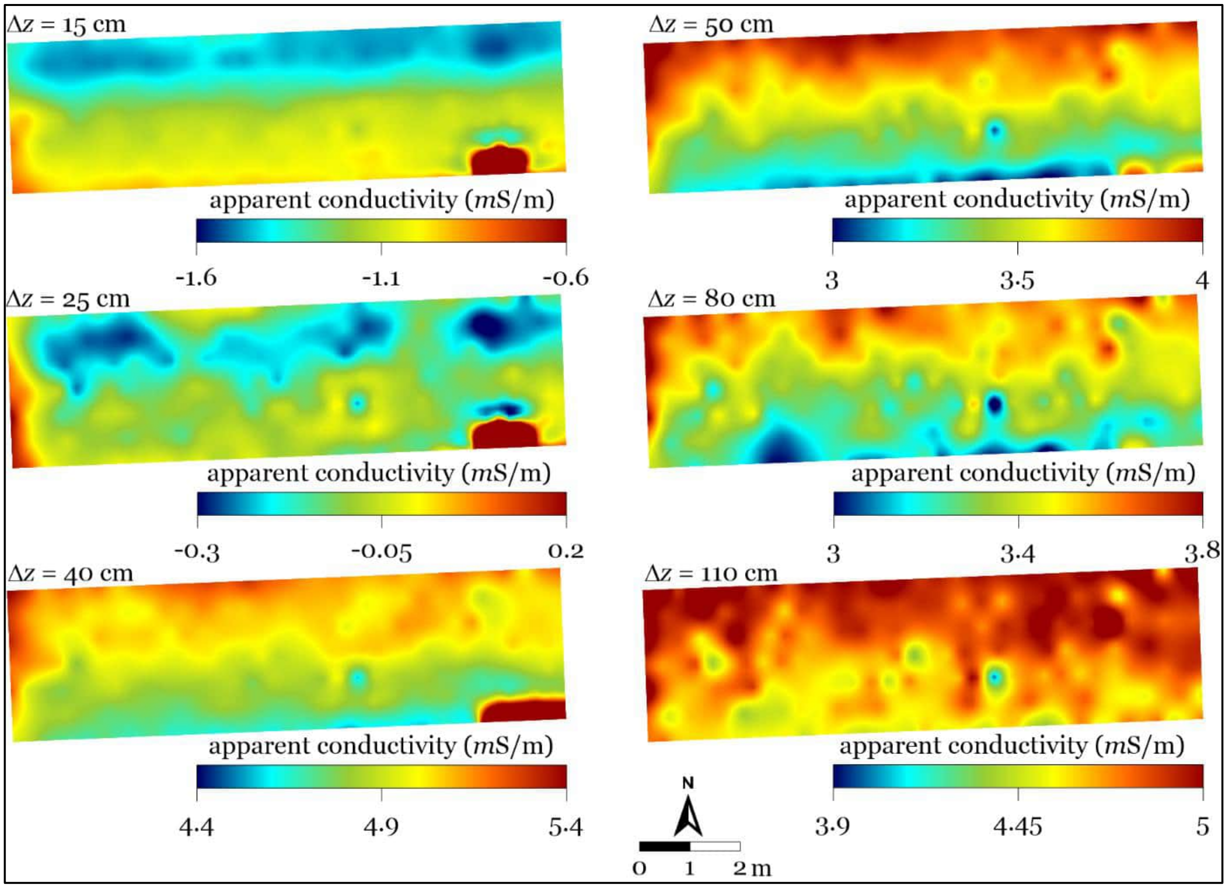


**Figure 4-14. Maps of apparent electrical conductivity obtained in Sector 3 at different effective depth ranges (Δ*z*).**

## Sector 4

This sector is located south of the previous ones, as shown in Figure 4-6. Figure 4-15 shows the spatial distribution of the surveyed area, where a total of 17 parallel transects 17 m long were established, separated by a distance of 50 cm between them, covering a survey area of 8×17 $m^2$. The apparent electrical conductivity maps obtained in this sector are shown in Figure 4-16. The interpretations of these results are presented below:

- The map obtained in the effective depth range of Δ*z* = 15 cm is characterized by a set of apparent electrical conductivity anomalies with values ranging from -1.6 to -0.6 *m*S/m. As in the results obtained previously, this map is associated with the sandy loam soil that characterizes the region. A set of dark red anomalies is present in the northwestern and southwestern parts, not only of this map, but of all of them, reaching an effective depth range of 110 cm, although in the last two maps, these anomalies show a certain level of distortion. This set can be associated with burned tree roots or rocks. Archaeological intervention would be necessary in order to verify the nature of these anomalies.
- The second map obtained in the effective depth range of Δ*z* = 25 cm also shows low apparent electrical conductivity values (-0.6 → 0.2 *m*S/m), which could be associated with the eluvial layer of fine sand present in the region. The specific anomalies indicated in the previous map are repeated, but on a larger scale.
- The range of apparent electrical conductivity values that characterize the third map (Δ*z* = 40 cm) reaches its maximum (3.6 → 4.6 *m*S/m), and, as in the previous results, this increase in the apparent electrical conductivity of the soil could be associated with the presence of minerals (aluminium and iron)

contained in sandy soils. The specific electrical anomalies continue to be preserved at this effective depth range.

- The fourth map (Δ*z* = 50 cm) shows two anomalies whose interface can be seen in the central part of the map, with low apparent electrical conductivity values (< 2.4 *m*S/m) in light blue, blue and light green tones located on the left side of the map, and higher apparent electrical conductivity values (> 2.4 *m*S/m) in the rest of the map, which could be associated with a higher concentration of minerals on the right side of the map.
- In the last two maps (Δ*z* = 80 and 110 cm), the ranges of apparent electrical conductivity values are somewhat similar and are greater than those identified in the maps obtained in the first effective depth ranges. These values could be associated with the presence of sand, gravel, and clay.

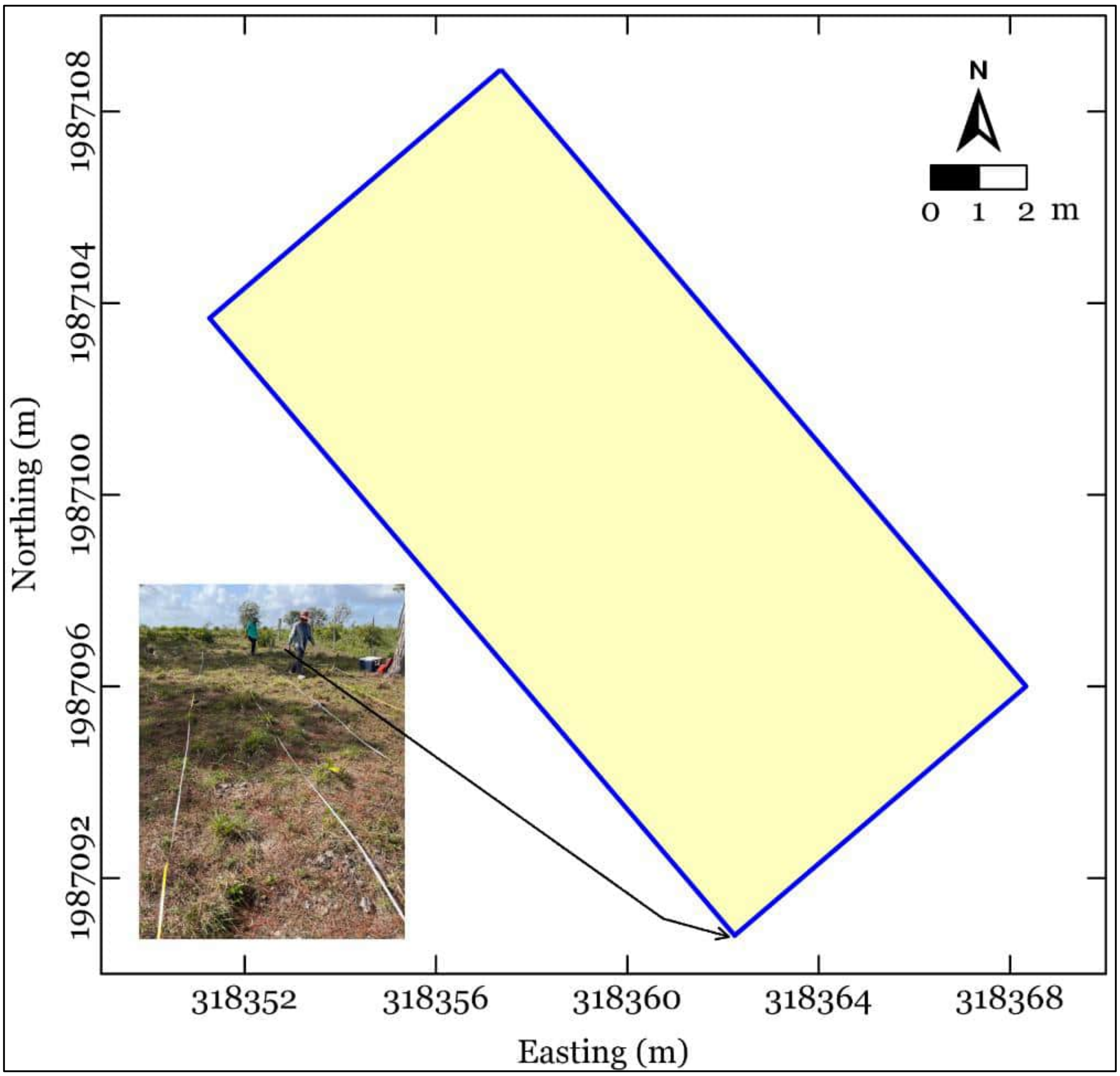


**Figure 4-14. Spatial projection in UTM coordinates of the surveyed area in Sector 4.**

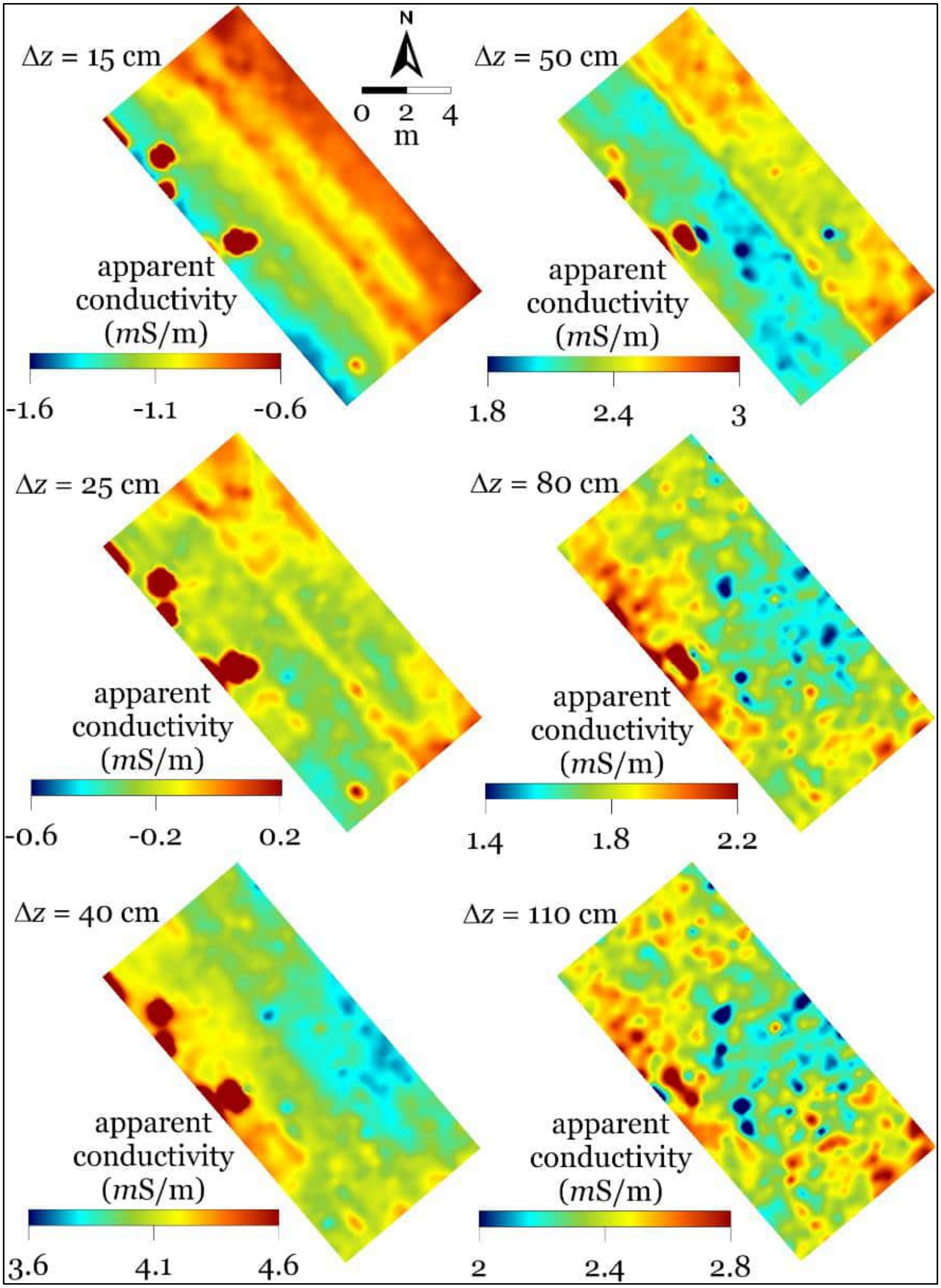


**Figure 4-15. Maps of apparent electrical conductivity obtained in Sector 4 at different effective depth ranges (Δz).**

## Conclusions

The electrical conductivity maps obtained in the four study sectors show almost identical behavior, with those generated in the first two effective depth ranges ($\Delta z$ = 15 and 25 cm) having very low and negative values for this electrical parameter, indicating the presence of sandy material and organic matter concentrated on the surface. Higher apparent electrical conductivity values are shown in the maps obtained at the effective depth range of $\Delta z$ = 40 cm, which is consistent with the presence of minerals in a sandy horizon present at these depths, according to the excavations already carried out. The latest maps ($\Delta z$ = 50, 80 and 110 cm) show an increase in the apparent electrical conductivity value compared to the surface maps, which could be linked to the presence of sand and minerals, turbiditic sands, and clay at depths. The 2D electrical resistivity tomography test showed a surface horizon composed of a group of very high resistivity anomalies, which is linked to the presence of sandy horizons characteristic of the site, followed by anomalies of lower electrical resistivity that could be associated with the presence of minerals in the subsoil. It is important to emphasize that the possibility of identifying electrical anomalies linked to archaeological features such as projectile point, for example, is complicated and unlikely due to the resolution of the equipment used. However, certain anomalies revealed by our geophysical survey, especially in Sectors 2, 3 and 4, could correspond to archaeological remains, including features comprised of large stones, so it is recommended that their nature be verified through excavations.

## Acknowledgements

The authors would like to thank the members and workers of the Pine Ridge Preceramic Project, the *DEMETER Association* (France) for the financial support provided for the development of this phase of studies, the *Universidad Tecnológica de Panamá* (UTP) for providing the geophysical device used in this research, as well as the owners of the areas investigated and the Belize Institute of Archaeology for allowing us to work at such an important archaeological site.

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# Chapter 5. The 2025 Field Season of the Pine Ridge Preceramic Project (August Pine Ridge, Orange Walk District, Belize): Ground Stone Artifacts

**Sébastien Perrot-Minnot, Victoria C. Pagano, and Jon C. Lohse**

The 2025 field season of the Pine Ridge Preceramic Project documented only six potentially preceramic ground stone artifacts in the August Pine Ridge (APR) area, Orange Walk District, Belize: a metate (Specimen JT-83), a fragment of a metate or stone bowl (Specimen CL-01), a small stone bowl (Specimen CL-01), two spherical hammers (Specimen CL-01), and a nucleus also used as a hammer (Specimen CL-01). Four of these objects belong to private collections of APR residents, while the others were discovered on the surface in the sand quarries.

**Table 5-1. Metate (Figure 5-1).**

| Specimen | JT-83 |
|---|---|
| Description | Trough metate with an elongated, irregular shape and a flat bottom. The shallow trough retains a whitish residue. |
| Dimensions | Length: 168 mm; width: 127 mm; height: ca. 30 mm |
| Weight | 1110.05 g |
| Provenience | Private collection. The object was found in a sand pit in August Pine Ridge. |
| Comment | Similar metates in Mesoamerica date from the Archaic to the Postclassic period. |


**Figure 5-1. Metate fragment, specimen JT-83. Photo: Sébastien Perrot-Minnot.**

**Table 5-2.Fragment of a metate or stone bowl (Figure 5-2).**

| Specimen | CL-01 |
|---|---|
| Description | Triangular, curved fragment with one rounded side, showing impact marks and striations. |
| Dimensions | Length: 98 mm; width: 57 mm; max. thickness: 33 mm |
| Weight | 268.36 g. |
| Provenience | Surface collection near Unit CM. |
| Comment | It could be a fragment of a metate or stone bowl (several potentially Archaic stone vessels have been discovered at August Pine Ridge; see Perrot-Minnot 2024). It appears to have been reused as a pestle. |


**Figure 5-2. Fragment of a metate or stone bowl, specimen CL-01. Photo: Sébastien Perrot-Minnot.**

**Table 5-3. Small stone bowl (Figure 5-3 top, bottom).**

| Specimen | JT-82 |
|---|---|
| Description | Small oval-shaped stone bowl, well crafted, with impact marks and striations on the bottom. It was broken in two, probably when it was discovered, but the two pieces were glued back together by its owner. |
| Dimensions | Length: 87 mm; width: 68 mm; height: 37 mm |
| Weight | 289.21 g. |
| Provenience | Private collection. The object was found in a sand pit in August Pine Ridge. |
| Comment | Other potentially Archaic stone vessels have been discovered at August Pine Ridge (Perrot-Minnot 2024), but this one is the smallest in our corpus. It appears to have been used as a mortar, but its elaborate design suggests that its function was not solely utilitarian. |


**Figure 5-3. Small stone bowl, specimen JT-82.**
**(Top) Plan view interior of bowl; (Bottom) Profile view of bowl.**
**Photos: Sébastien Perrot-Minnot.**

**Table 5-4. Pecked sphere, probable hammer (Figure 5-4).**

| Specimen | CC-08 |
|---|---|
| Description | Pecked stone sphere showing impact marks across its entire surface. |
| Diameter | 56 mm |
| Weight | 245.1 g. |
| Provenience | Private collection. The object was found in a sand pit in August Pine Ridge. |
| Comment | Several stone balls, some of which have been identified as hammers, have already been documented by the Pine Ridge Preceramic Project (Perrot-Minnot 2025). |


**Figure 5-4. Pecked sphere, probable hammer, specimen CC-08. Photo: Sébastien Perrot-Minnot.**

**Table 5-5. Stone ball, possible hammer (Figure 5-5).**

| Specimen | IT-41 |
|---|---|
| Description | Stone ball showing impact marks in a particular area. This artifact appears to have originally been a pebble. |
| Diameter | 55 mm |
| Weight | 259.85 g. |
| Provenience | Private collection. The object was found in a sand pit in August Pine Ridge. |
| Comment | See previous item. |


**Figure 5-5. Stone ball, apparently used as a hammer, specimen IT-41. Photo: Sébastien Perrot-Minnot.**

**Table 5-6. Hammer on core (Figures 6a, 6b).**

| Specimen | CL-02 |
|---|---|
| **Description** | Multidirectional irregular flake core with cortex. A concentration of impact marks is visible on part of the object. |
| **Dimensions** | Length: 67 mm; width: 52 mm; height: 42 mm |
| **Weight** | 159.07 g |
| **Provenience** | Surface collection from roadway between the APRC and Three Corners areas. |
| **Comment** | The core was also used or reused as a hammer. Artifacts of this type are not common in the prehistoric archaeological record, either in Mesoamerica or elsewhere. In general, the characteristics of cores are not ideal for hammering, which may suggest cultural choices (Thiébault et al. 2010). However, such hammers can also offer technical advantages. John E. Clark and colleagues note on this subject: “The propensity of flint or chert to break makes them excellent raw materials for pecking hammerstones. Expended chert cores and broken bifaces were used in Mesoamerica as hammerstone pics. The sharp edges and ridges of these recycled forms cut into the surfaces of workpieces, and because these hammers are brittle and easily fractured, some of their edges are partially self-sharpening” (Clark et al. 2020). |


**Figure 5-6. Hammer on core, specimen CL-02. Photo: Sébastien Perrot-Minnot. (Top) Dorsal view of specimen; (Bottom) Profile view of specimen.**

This small collection of artifacts bears witness to various activities – craftsmanship, subsistence, and perhaps symbolic or ritualistic practices – but the lack of data on the archaeological context of the objects prevents us from advancing very far in their interpretation. Of particular interest is the identification of new hammers, which reveal the importance of stoneworking at APR in prehispanic times.

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# Chapter 6. Defining a Unique Chert Type in August Pine Ridge

**Abigail Antinossi**

Dating preceramic lithic materials in Belize has often proved a difficult task. The sparse radiocarbon dates that are available for debitage or technological tool forms associated with datable material are consistently challenged or revisited (Kelly 1993; Pohl et al. 1996; Prufer and Kennett 2020; Stemp and Rosenswig 2022). Yet, dating lithic materials is important to answering questions of the mobility of Paleoindian and Archaic populations. With the relative lack of consistent, corroborated, or definitive dating for materials excavated or collected in this region, raw material type, quality, and source has sometimes been used to establish both a chronology of tool forms and approximate chronology of site activity for areas without datable material (Lohse et al. 2006; Zeitlin and Zeitlin 2000). In archaeological studies of Paleoindian and Archaic periods in northern Belize, the North Belize Chert Bearing Zone [NBCZ] is, in many cases, the presumed source of raw material for preceramic tool technology (Hester and Shafer 1984; Stemp and Rosenswig 2022) The NBCZ is the source of high-quality chert material for much of the archaeological material in Northern Belize, and is characterized by a well-developed white patina covering chert colors of dark brown, honey-colored, yellowish-brown, or grayish-brown material (Hester and Shafer 1984; Stemp and Rosenswig 2022).

As of yet, there has been little research done on other high-quality chert materials excavated or collected in Northern Belize that exhibit few to no qualities associated with NBCZ cherts. In August Pine Ridge (APR), a high-quality chert material bearing very few similarities to other known Belizean cherts has been documented though three years of excavations and collections in and around the nearby sand quarries; this material is referred to thusly as APR Purple. APR Purple is documented in collected points in Paleoindian and Archaic styles, and debitage exhibiting technological behaviors of notched point production, indicating its use for complex biface reduction. The classification of APR Purple and its chronological associations with complex biface reduction may offer a new supplement to other dating methods for sites without radiocarbon dates in Northern Belize (see Figure 3-1).

## Raw Material Qualities

APR Purple (APR Purple) is a chert material found in archaeological contexts and collected assemblages from the northwest region of Belize. Specifically, the material has been documented in abundance from APR but is yet unknown from other sites. Lithics of this material have been collected by the PRPP team since 2023 in the form of lithic preforms, unfinished tools, and multi-purple flake tools; and excavated in the form of lithic debitage. Fresh breaks and surface exposures appear purple in direct sunlight, giving this material its distinctive appearance and name.

APR Purple chert is fine-grained chert with "high-quality" characteristics including a very fine grain size with few inclusions. Flaked surfaces are smooth, though not particularly polished, and individual grains are not visible to the naked eye. The material exhibits a consistent conchoidal fracture in that a percussion force moves through the matrix evenly and fractures with very sharp edges making it highly suitable for controlled flake removal. The material has a homogeneous quality with minimal non-chert inclusions, though it varies in color and translucency throughout any given point, flake, or assemblage.

It has a relatively consistent resinous luster, though heavy patination can affect the quality of that luster. To examine color variability, 27 documented lithic materials classified as APR Purple Chert in the PRPP borrowed collection were compared with a geologic Munsell (Figure 6-1). Color matches were recorded by specimen, and for each specimen multiple points of comparison were considered. The most common colors within specimens were 5YR 5/6 for the chert color, 10 YR 7/4 for the patina color, and 10 YR 8/2 for the cortex, although values such as N8, 5YR 2/2, and 5YR 4/4 were also documented in multiple specimens of APR Purple. Notably, these Munsell values do not accurately account for the changes in translucency or luster within and between specimens. On one specimen, DC-29, breakage revealed that the unpatinated chert was significantly different from its patinated counterpart, revealing the purple color from which the chert type was named. A separate weathering process, which we call a “drying out,” revealed the speckled presence of N8 coloration.


**Figure 6-1. Munsell color chits showing color range for APR Purple.**

The translucency of APR Purple is perhaps one of its most defining characteristics, though this quality often varies. The translucency of this chert can be categorized based on similarities in weathering and patination. In some variations, the material is fully translucent, and in others, the chert material is highly or moderately translucent. The translucency is impacted, but never particularly stymied, by patination or thickness. For one collected specimen, IT-40, a Lowe point preform failure (Figure 6-2), the chert at 9.3mm thick remains translucent through heavy patination.


**Figure 6-2. Specimen IT-40, Lowe biface preform of APR Purple.**

Heavy patination often makes the material less translucent (though never totally opaque). In the areas in which APR Purple is fully translucent, there are red inclusions of a partially translucent material with a purple/brown undertone. A finished point of Waisted Fluted style (DC-29) called the Chan Point (Figures 6-3 and 6-4), exhibits these qualities. The translucency of APR Purple varies with chert color, and ranges from a white/clear translucency to an orange translucency, to a purple translucency depending on the patination cover.


**Figure 6-3. DC-29, the Chan Point, is of a highly translucent variety of APR Purple. Faint white speckling from drying out can be seen at the base.**

The weathering/drying is apparent in the form of white/grey speckling originating most often from points of percussion/from the edges of the flake; in many instances flakes take on an orange and glassy aspect (especially evident in debitage from later reduction stages). APR Purple exhibits a range of highly variable patination. In some variations, there is a semi-translucent orange/beige color with well-developed patination, while in others the patination appears as beige or white speckled inclusions and is moderately developed across the surface, dispersing outwards usually from a more complete covering of patination. The patination is often an orange/brown color and appears in a "spore-like" pattern across the surface of the object. Variation within patination can occur even within the same flake or tool. Interestingly and perhaps importantly, freshly wetting the surface can change the appearance of both the patination and chert. When wet, the patination fades and allows the shades of purple in the chert to become more visible. The variation in both patination and translucency within lithics of APR Purple has complicated identification although the translucent quality of the chert despite thickness or patination coverage remains a diagnostic feature of this material type. Cortex, which is scarce for this material type, is a chalky, grey, potholed material with a bright white band separating knappable chert.

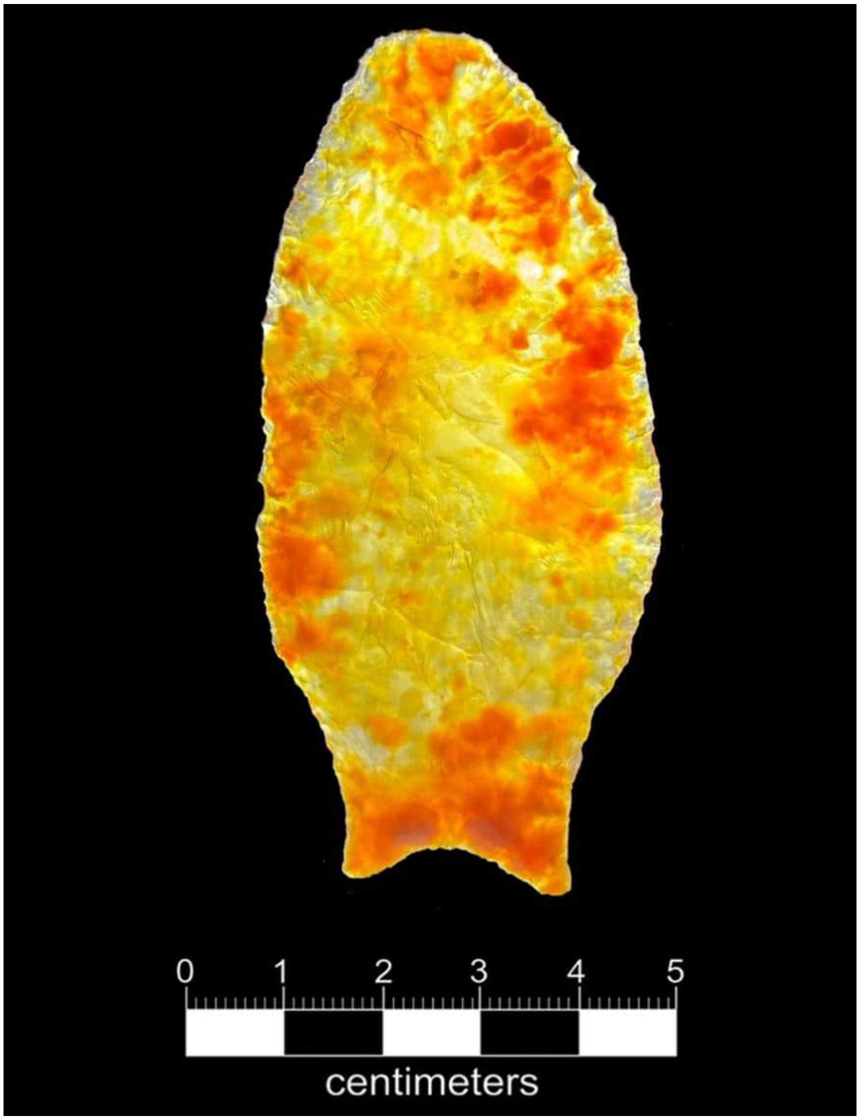


**Figure 6-4. The Chan Point lit from the back.**

## APR Purple in Excavated Contexts

A very large number of the projectile points that are in our borrowed inventory are made from APR Purple. However, some APR Purple has also appeared in excavated contexts distributed throughout the Pine Ridge. Debitage of APR Purple has been found in mixed contexts with other chert materials when excavating units, and in isolated contexts through shovel test pits. Most often, APR Purple is located below the orange sand stratum, approximately 50 centimeters below the surface. In units CF and CE, for example, two thin flakes of APR Purple were found at a depth of 80-100 cm. In units CB and CD, APR Purple flakes were found just above the basal clay stratum that marks the bottom of our excavations. Importantly, some APR Purple flakes retained platforms; these tend to be highly prepared and in many cases ground, indicative of removal from well-prepared bifaces that define the Early Preceramic part of our local chronology (see Figure 3-1).

In an exceptional instance of debitage preservation, an isolated excavation of a surface feature of associated debitage resulted in the collection of 444 pieces of APR Purple (two additional pieces collected from this context are of a different material). This surface collection, Lot AI-01, appeared after overnight rainfall and was found just above basal clay deposits that underlie the area's sandy overburden, in the center of an unpaved road (Figure 6-5).

**Figure 6-5. Exposure and documentation of Lot AI-01 in the 2023 field season (Lohse et al. 2024:Figure 1-5).**

Of the 444 chipped stone pieces, all were APR Purple and all had the same weathering patterns (Antinossi 2025; Figure 6-6). The debitage was not fully patinated and appeared purple when wet, likely owing to the fresh exposure and moisture from previous night's rain; it appeared orange where patinated. One flake fragment had damage which revealed the underlying chert color, which is 5R 3/4. Of the APR Purple pieces collected from this context, approximately 206 of them are classified as flakes based on the presence of a having at least a discernable remnant of a platform. Flake sizes range from as long as 58.93 mm to only a few mm in length; the majority of these flakes were detached by pressure and might be considered edge retouch or platform preparation flakes removed for the purpose of isolating and defining larger striking platforms for biface manufacture. Platform treatments include some combination of being multifaceted, complex, faceted, and/or abraded. Although some cortex is present within this assemblage, the technological nature of the collection indicates late-stage biface reduction and the targeted removal of small flakes for the purpose of biface shaping. The homogeneity of this debitage collection in terms of both flake type (tertiary, high frequency of pressure flakes) and raw material (APR Purple) together is interpreted as representing a single, discrete knapping event. Importantly, present in this assemblage are three clearly defined notching flakes (dozens of additional items resemble winged flakes indicating removal from concave margins), which reflects the production of a notched biface, potentially a Sawmill or Lowe point.


**Figure 6-6. Representative flakes of APR Purple from AI-01.**

## APR Purple in Collected Contexts

APR Purple has been documented in collected intact or nearly intact biface projectile points, preforms, scrapers, and tools (Table 6-1). The tools which are labeled as APR Purple are variable in their appearance, with translucency being a consistent characteristic. Some are very lightly patinated, while others are almost entirely patinated. The thickness varies drastically between specimens, due in part to stage of reduction. The vast majority of artifacts made from APR Purple are considered to be Paleoindian in age; APR Purple is not associated with one particular tool typology, but rather is documented in specimens bearing Clovis, Fishtail, and Waisted-Fluted technological characteristics. This indicates that this raw material was not preferentially selected for a specific technology, or by a people who operated within a singular technological framework but instead was widely used for chipped stone tool production starting in the Terminal Pleistocene.

APR Purple has been documented on three Early Archaic artifacts in our collection; all three specimens are associated with the Lowe style. Specimen IT-40, a Lowe preform, is of particular interest (see Figure 6-2), as it is nearly a centimeter thick and is still translucent when targeted with direct light. Moreover, the excavated unit AI had terminal notching flakes, which can be identifiable to the Lowe style. Specimen ER-12 is considered Lowe-like, as it does not conform perfectly with the type descriptions for that style (Figure 6-7). On this basis, we extend the period of utilization of this material source into the Early Holocene as well. One specimen is a heavily reworked Pine Ridge biface (Figure 6-8), providing chronological continuity from fluted to Lowe points. From our observations among excavated and borrowed assemblage materials, we conclude that APR Purple was a raw material used predominantly from the Early to Late Paleoindian and into the Early Archaic period in Belize, what we call the Early Preceramic (see Figure 3-1), and was chosen preferentially due to its high knappability and controlled flake removal for technically complex lithic production.

**Table 6-1. Documented Instances of APR Purple in PRPP Collected Specimens.**

| Specimen | Description | Proposed Period |
|---|---|---|
| **IT-40** | Biface Preform (Lowe) | Early Archaic |
| **JT-18** | Biface Preform (Lowe) | Early Archaic |
| **ER-12** | Projectile Point (Lowe-like) | Early Archaic |
| **JT-03** | Uniface Scraper | Paleoindian |
| **JT-01** | Uniface Flake Tool | Paleoindian |
| **IT-27** | Uniface Flake Tool | Paleoindian |
| **DC-13** | Biface Preform (Waisted-Fluted) | Paleoindian |
| **ER-10** | Projectile Point (Waisted-Fluted) | Paleoindian |
| **IT-07** | Projectile Point (Waisted Fluted) | Paleoindian |
| **IT-10** | Projectile Point (Waisted-Fluted) | Paleoindian |
| **DC-28** | Projectile Point (Fishtail) | Paleoindian |
| **LC-11** | Biface Preform (Fishtail) | Paleoindian |
| **IT-18** | Biface Point (Indeterminate) | Paleoindian |
| **JT-08** | Biface (Indeterminate) | Paleoindian |
| **IB-03** | Biface Point (Indeterminate) | Paleoindian |
| **JT-34** | Biface Preform (Waisted Fluted) | Paleoindian |
| **JT-40** | Biface Point (Waisted Fluted) | Paleoindian |
| **JT-63** | Biface Point (Lowe) | Early Archaic |
| **IT-15** | Biface Point (Indeterminate) | Paleoindian |
| **IT-37** | Biface Preform (Clovis-like) | Paleoindian |
| **JT-15** | Biface Preform (Clovis-like) | Paleoindian |
| **JT-11** | Biface Preform (Indeterminate) | Paleoindian |
| **JT-05** | Biface Preform (Indeterminate) | Paleoindian |
| **JT-50** | Biface preform (Waisted Fluted) | Paleoindian |
| **JT-09** | Biface Preform (Indeterminate) | Paleoindian |
| **JT-53** | Biface (Pine Ridge) | Paleoindian |
| **IB-15** | Biface Preform (Indeterminate) | Paleoindian |
| **DC-29 (Chan Point)** | Projectile Point (Waisted-Fluted) | Paleoindian |


**Figure 6-7. Specimen ER-12, Lowe-like biface from APR.**


**Figure 6-8. Specimen JT-53, a reworked Pine Ridge biface of APR Purple.**

## Sourcing

The geologic source of APR Purple is presently unknown. This material does not exhibit the same qualities in stone color and banding, and weathering/patination patterns as the majority of cherts from the NBCZ, in that the chert is highly translucent, and the patination is not an all-encompassing white variety. However, a longstanding issue with chert souring efforts is the variability in chert outcrops and similarities in chert qualities in distant outcroppings (Speer 2014). We argue that APR Purple is a raw material of a different origin, and that its origin is so far unknown. Knowing the source of APR Purple would help define the relationship between early inhabitants of this part of Central America and the settlement of the Pine Ridge, as mobile populations would have mapped onto different preferential resources like high quality siliceous stone as well as food resources including wild game, and how these resources were distributed on the larger landscape. We have yet to observe or document any knappable stone occurring on the sandy landform of APR, either in *in situ* deposits or alluvial gravels, so these early inhabitants would have had to extend their learned landscape across a larger catchment, within which the Pine Ridge played a role in terms of residential location. Determining the source of this unique chert will be instrumental in our understanding of Pine Ridge occupation and resource use in the Paleoindian and Early Archaic periods, as this chert type is, to our knowledge, not found at any other known regional sites. Geochemical sourcing techniques should be applied to this raw material to confirm its difference from the NBCZ, and to begin a better understanding of the origin of this unique material which is not native to the Pine Ridge. Considering that it seems to have disappeared from the regional record perhaps around 8000 years ago, it is possible that the geologic source was submerged by rising sea levels, and became lost or unavailable to early inhabitants of northern Belize and perhaps southern Yucatan.

## Conclusions and Chronological Capabilities

In the absence of datable archaeological evidence, chert material and source, as an element of technological decision-making that changes over time, may be used in conjunction with technical attributes and formal tool types to establish a chronology of Paleoindian and Archaic Central America. Prior to 2019, the assumed Archaic chronology for Lowe points in Belize was rooted in a few scattered radiocarbon dates (Pohl et al. 1996). However, following the publication of secure dates from rockshelter excavations in southern Belize (Prufer et al. 2019), archaeologists are now confident that Lowe specimens are Early Archaic in age from approximately 9200-8500 years ago. These specimens now help anchor a chronological sequence of complex biface forms that extends back into the Terminal Pleistocene (see Chapter 3). At APR, we have documented the use of APR Purple on Lowe points as well as many of the forms and associated tool types that predate when Lowe points were in use. Apart from two flake cores recovered in 2025 at the bottom of Unit CB, there is virtually no evidence that APR Purple was used in what we call the Late Preceramic (see Figure 3-1), defined in large part by exclusively unifacial technology and the absence of complex biface forms. We have recovered APR Purple in excavated contexts, where it is associated with in situ biface, probably Lowe or Sawmill point production. It is abundantly represented in older specimens in our borrowed inventory.

The classification of APR Purple as a unique material type raises some important questions: Where did this material come from, and why did it disappear from the record alongside the production of complex bifaces. Based on our assessment, the presence of APR Purple in an assemblage of debitage or in completed tool forms can be used to augment existing methods of argument for the chronology of lithic production, such as technological form or stratigraphic horizons, in Northern Belize. Documenting its presence beyond APR, determining its geologic source, and conducting elemental or compositional analyses to characterize its chemical signatures are all avenues for future research.

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# Appendix A. Excavation Inventory: 2023-2025

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **AA01** | 1 | APRC1 | AA | 01 | 0-25 | Debitage | Flake | Chert | AA01.01: assorted debitage | 1 | 11 |
| **AA02** | 1 | APRC1 | AA | 02 | 25-40 | Debitage | Flake | Chert | AA02.01: assorted debitage | 4 | 37.59 |
| **AA02** | 2 | APRC1 | AA | 02 | 25-40 | Uniface | Scraper | Chert | AA02.02: cream-orange scraper | 1 | 3.91 |
| **AA03** | 1 | APRC1 | AA | 03 | 40-60 | Debitage | Flake | Chert | AA03.01: assorted debitage | 4 | 3.56 |
| **AB01** | 1 | APRC1 | AB | 01 | 0-20 | Debitage | Flake | Chert | AB01.01: assorted debitage | 5 | 6.93 |
| **AB01** | 2 | APRC1 | AB | 01 | 0-20 | Hammerstone | Chunk | Chert | AB01.02: probable broken hammerstone | 1 | 53.88 |
| **AB02** | 1 | APRC1 | AB | 02 | 20-40 | Debitage | Flake | Chert | AB02.01: assorted debitage | 12 | 119.18 |
| **AB02** | 2 | APRC1 | AB | 02 | 20-40 | Burned Rock | Burned Rock | Limestone | AB02.02: burned rock fragments | 2 | 134.84 |
| **AB02** | 3 | APRC1 | AB | 02 | 20-40 | Manuport | Hammerstone | Quartzite | AB02.03: rounded small cobble, tan, possible hammerstone | 1 | 57.49 |
| **AB03** | 1 | APRC1 | AB | 03 | 40-60 | Debitage | Flake | Chert | AB03.01: assorted debitage | 3 | 1.2 |
| **AC01** | 1 | APRC1 | AC | 01 | 0-20 | Debitage | Flake | Chert | AC01.01: assorted debitage | 3 | 124.01 |
| **AC01** | 2 | APRC1 | AC | 01 | 0-20 | Adze | Adze | Chert | AC01.02: broken Maya-period adze | 1 | 165.53 |
| **AC02** | 1 | APRC1 | AC | 02 | 20-40 | Debitage | Flake | Chert | AC02.01: assorted debitage | 5 | 45.89 |
| **AC02** | 2 | APRC1 | AC | 02 | 20-40 | Burned Rock | Burned Rock | Limestone | AC02.02: burned rock fragments | 3 | 24.52 |
| **AC02** | 3 | APRC1 | AC | 02 | 20-40 | Debitage | Macroflake | Chert | AC02.03: 1 grey and 1 cream-orange macroflake | 2 | 242.14 |
| **AC02** | 4 | APRC1 | AC | 02 | 20-40 | Debitage | Core | Chert | AC02.04: yellow-brown possible core fragment/reduced core | 2 | 96.96 |
| **AC02** | 5 | APRC1 | AC | 02 | 20-40 | Manuport | Hammerstone | Chert | AC02.05: possible hammerstone or just a manuport | 1 | 122.53 |
| **AC03** | 1 | APRC1 | AC | 03 | 40-75 | Debitage | Flake | Chert | AC03.01: assorted debitage | 1 | 2.11 |
| **AD01** | 1 | APRC1 | AD | 01 | 0-20 | Debitage | Flake | Chert | AD01.01: assorted debitage | 57 | 447 |
| **AD01** | 2 | APRC1 | AD | 01 | 0-20 | Burned Rock | Burned Rock | Limestone | AD01.02: burned rock fragments | 8 | 114 |
| **AD02** | 1 | APRC1 | AD | 02 | 20-40 | Debitage | Flake | Chert | AD02.01: assorted debitage | 48 | 209.6 |
| **AD02** | 2 | APRC1 | AD | 02 | 20-40 | Uniface | Flake Tool | Chert | AD02.02: large chunky uniface (1); thin white (1) | 2 | 181.63 |
| **AD02** | 3 | APRC1 | AD | 02 | 20-40 | Manuport | Hammerstone | Quartzite | AD02.03: probable hammerstone fragment; black | 1 | 32.1 |
| **AD03** | 1 | APRC1 | AD | 03 | 40-75 | Debitage | Flake | Chert | AD03.01: assorted debitage | 5 | 42.72 |
| **AD03** | 2 | APRC1 | AD | 03 | 40-75 | Adze | Adze | Chert | AD03.02: Maya-period polished adze fragment | 1 | 24.35 |
| **AE01** | 1 | SandPits | AE | 01 | -- | Manuport | Hammerstone | Chert | AE01.01: chert hammerstone fragment | 1 | 117.81 |
| **AE02** | 1 | SandPits | AE | 01 | -- | Debitage | Flake | Chert | AE02.01: probable paleoindian material flakes | 2 | 54.3 |
| **AE03** | 1 | SandPits | AE | 01 | -- | Debitage | Flake | Chert | AE03.01: probable paleoindian material flake | 1 | 16.66 |
| **AF01** | 1 | APRC2 | AF | 01 | 0-20 | Debitage | Flake | Chert | AF01.01: assorted debitage | 23 | 82.24 |
| **AF01** | 2 | APRC2 | AF | 01 | 0-20 | Biface | Chunk | Chert | AF01.02: chunky orange mottled biface | 1 | 68.25 |
| **AF02** | 1 | APRC2 | AF | 02 | 20-45 | Debitage | Flake | Chert | AF02.01: assorted debitage | 117 | 245.03 |
| **AF02** | 2 | APRC2 | AF | 02 | 20-45 | Ceramic | Ceramic | Clay | AF02.02: maya-period ceramic sherds | 4 | 14.93 |
| **AF02** | 3 | APRC2 | AF | 02 | 20-45 | Manuport | Hammerstone | Chert | AF02.03: hammerstone/possible core fragment, tan chert | 1 | 166.3 |
| **AF02** | 4 | APRC2 | AF | 02 | 20-45 | Manuport | Hammerstone | Chert | AF02.04: flat sided, rounded hammerstone from north profile | 1 | 232.52 |
| **AF02** | 5 | APRC2 | AF | 02 | 20-45 | Burned Rock | Burned Rock | Sedimentary | AF02.05: burned rock fragments | -- | 515.8 |
| **AF03** | 1 | APRC2 | AF | 03 | 45-60 | Debitage | Flake | Chert | AF03.01: assorted debitage | 55 | 96.2 |
| **AF03** | 2 | APRC2 | AF | 03 | 45-60 | Biface | Chunk | Chert | AF03.02 broken bifacially worked chert chunk, tan-brown | 1 | 30.18 |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **AF03** | 3 | APRC2 | AF | 03 | 45-60 | Manuport | Core | Chert | AF03.03: patinated cream core fragment | 1 | 158.72 |
| **AF03** | 4 | APRC2 | AF | 03 | 45-60 | Matrix Sample | Matrix | Matrix | AF03.L04: ashy matrix from Feature 01; ~40-45cmbs | -- | -- |
| **AF04** | 1 | APRC2 | AF | 04 | 60-70 | Debitage | Flake | Chert | AF04.01:assorted debitage | 5 | 2.48 |
| **AG01** | 1 | APRC2 | AG | 01 | 0-20 | Debitage | Flake | Chert | AG01.01: assorted debitage | 2 | 2.78 |
| **AG02** | 1 | APRC2 | AG | 02 | 20-40 | Debitage | Flake | Chert | AG02.01: assorted debitage | 75 | 222.94 |
| **AG02** | 2 | APRC2 | AG | 02 | 20-40 | Ceramic | Ceramic | Clay | AG02.02: Maya-period sherd | 1 | 38.58 |
| **AG03** | 1 | APRC2 | AG | 03 | 40-60 | Debitage | Flake | Chert | AG03.01: assorted debitage | 40 | 87.35 |
| **AG04** | 1 | APRC2 | AG | 04 | 60-70 | Debitage | Flake | Chert | AG04.01: assorted debitage | 1 | 0.46 |
| **AH01** | 1 | APRC3 | AH | 01 | -- | Adze | Constricted Adze | Chert | AH01.01: surface collect from the APRC area; heavily patinated | 1 | 510 |
| **AI01** | 1 | APRC3 | AI | 01 | 0-15 | Debitage | Flake | Chert | AI01.01: water screen 1mm and 1/4"screen | 452 | 263.81 |
| **AJ01** | 1 | APRC3 | AJ | 01 | 0-20 | Debitage | Flake | Chert | AJ01.01: assorted debitage | 30 | 26.77 |
| **AJ01** | 2 | APRC3 | AJ | 01 | 0-20 | Biface | Preform | Chert | AJ01.02: patinated white biface fragment | 1 | 36.52 |
| **AJ02** | 1 | APRC3 | AJ | 02 | 20-40 | Debitage | Flake | Chert | AJ02.01: assorted debitage | 113 | 88.77 |
| **AJ03** | 1 | APRC3 | AJ | 03 | 40-60 | Debitage | Flake | Chert | AJ03.01: assorted debitage | 93 | 118.3 |
| **AJ03** | 2 | APRC3 | AJ | 03 | 40-60 | Debitage | Flake | Obsidian | AJ03.02: obsidian flake | 1 | 0.26 |
| **AJ04** | 1 | APRC3 | AJ | 04 | 60-70 | Debitage | Flake | Chert | AJ04.01: assorted debitage | 21 | 23.75 |
| **AJ04** | 2 | APRC3 | AJ | 04 | 60-70 | Uniface | Scraper | Chert | AJ04.02: patinated scraper | 1 | 25.53 |
| **AJ05** | 1 | APRC3 | AJ | 05 | 70-80 | Debitage | Flake | Chert | AJ05.01: assorted debitage | 8 | 14.7 |
| **AK01** | 1 | APRC3 | AK | 01 | 0-20 | Debitage | Flake | Chert | AK01.01: assorted debitage | 21 | 62.73 |
| **AK02** | 1 | APRC3 | AK | 02 | 20-40 | Debitage | Flake | Chert | AK02.01: assorted debitage | 60 | 30.68 |
| **AK03** | 1 | APRC3 | AK | 03 | 40-60 | Debitage | Flake | Chert | AK03.01: assorted debitage | 279 | 106.22 |
| **AK03** | 2 | APRC3 | AK | 03 | 40-60 | Manuport | Hammerstone | Quartzite | AK03.02: grey banded quartzite, no clear use | 1 | 112.37 |
| **AK03** | 3 | APRC3 | AK | 03 | 40-60 | Manuport | Core | Chert | AK03.03: assorted debitage | 1 | 48.8 |
| **AK04** | 1 | APRC3 | AK | 04 | 60-80 | Debitage | Flake | Chert | AK04.01: assorted debitage | 89 | 49.06 |
| **AL01** | -- | APRC2 | AL | 01 | 0-5 | Matrix Sample | Matrix | Matrix | AL01: column sample - no artifacts recovered | -- | 2L |
| **AL02** | -- | APRC2 | AL | 02 | 5-10 | Matrix Sample | Matrix | Matrix | AL02: column sample - no artifacts recovered | -- | 2L |
| **AL03** | -- | APRC2 | AL | 03 | 10-15 | Matrix Sample | Matrix | Matrix | AL03: column sample - no artifacts recovered | -- | 2L |
| **AL04** | 1 | APRC2 | AL | 04 | 15-20 | Debitage | Flake | Chert | AL04.01: assorted debitage/microdebitage | 1 | <0.01g |
| **AL05** | 1 | APRC2 | AL | 05 | 20-25 | Debitage | Flake | Chert | AL05.01: assorted debitage/microdebitage | 3 | 0.24 |
| **AL06** | 1 | APRC2 | AL | 06 | 25-30 | Debitage | Flake | Chert | AL06.01: assorted debitage/microdebitage | 3 | <0.01g |
| **AL07** | 1 | APRC2 | AL | 07 | 30-35 | Debitage | Flake | Chert | AL07.01: assorted debitage/microdebitage | 4 | 1.32 |
| **AL08** | 1 | APRC2 | AL | 08 | 35-40 | Uniface | Flake Tool | Chert | AL08.01: probable uniface | 1 | 11.21 |
| **AL09** | 1 | APRC2 | AL | 09 | 40-45 | Debitage | Flake | Chert | AL09.01: assorted debitage/microdebitage | 2 | 0.21 |
| **AL10** | 1 | APRC2 | AL | 10 | 45-50 | Debitage | Flake | Chert | AL10.01: assorted debitage/microdebitage | 4 | 1.51 |
| **AL11** | 1 | APRC2 | AL | 11 | 50-55 | Debitage | Flake | Chert | AL11.01: assorted debitage/microdebitage | 6 | 0.06 |
| **AL12** | 1 | APRC2 | AL | 12 | 55-60 | Matrix Sample | Matrix | Matrix | AL012: column sample - no artifacts recovered | -- | 2L |
| **AL13** | 1 | APRC2 | AL | 13 | 60-65 | Debitage | Flake | Chert | AL13.01: assorted debitage/microdebitage | 4 | 0.03 |
| **AL14** | 1 | APRC2 | AL | 14 | 65-70 | Matrix Sample | Matrix | Matrix | AL14: column sample - no artifacts recovered | -- | 2L |
| **AL15** | 1 | APRC2 | AL | 15 | 75-80 | Matrix Sample | Matrix | Matrix | AL15: column sample - no artifacts recovered | -- | 2L |
| **AL16** | 1 | APRC2 | AL | 16 | 80-85 | Matrix Sample | Matrix | Matrix | AL16: column sample - no artifacts recovered | -- | 2L |
| **AM01** | -- | APRC3 | AM | 01 | 0-5 | Matrix Sample | Matrix | Matrix | AM01: column sample - no artifacts recovered | -- | 2L |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM02** | -- | APRC3 | AM | 02 | 5-10 | Matrix Sample | Matrix | Matrix | AM02: column sample - no artifacts recovered | -- | 2L |
| **AM03** | 1 | APRC3 | AM | 03 | 10-15 | Debitage | Flake | Chert | AM03.01: assorted debitage/microdebitage | 1 | 2L |
| **AM04** | 1 | APRC3 | AM | 04 | 15-20 | Debitage | Flake | Chert | AM04.01: assorted debitage/microdebitage | 1 | 2L |
| **AM05** | 1 | APRC3 | AM | 05 | 20-25 | Debitage | Flake | Chert | AM05.01: assorted debitage/microdebitage | 1 | 2L |
| **AM06** | 1 | APRC3 | AM | 06 | 25-30 | Debitage | Flake | Chert | AM06.01: assorted debitage/microdebitage | 2 | 2L |
| **AM07** | 1 | APRC3 | AM | 07 | 30-35 | Debitage | Flake | Chert | AM07.01: assorted debitage/microdebitage | 1 | 2L |
| **AM08** | 1 | APRC3 | AM | 08 | 35-40 | Debitage | Flake | Chert | AM08.01: assorted debitage/microdebitage | 6 | 2L |
| **AM09** | 1 | APRC3 | AM | 09 | 40-45 | Debitage | Flake | Chert | AM09.01: assorted debitage/microdebitage | 5 | 2L |
| **AM10** | 1 | APRC3 | AM | 10 | 45-50 | Debitage | Flake | Chert | AM10.01: assorted debitage/microdebitage | 3 | 2L |
| **AM11** | -- | APRC3 | AM | 11 | 50-55 | Matrix Sample | Matrix | Matrix | AM11: column sample - no artifacts recovered | -- | 2L |
| **AM12** | -- | APRC3 | AM | 12 | 55-60 | Matrix Sample | Matrix | Matrix | AM12: column sample - no artifacts recovered | -- | 2L |
| **AM13** | -- | APRC3 | AM | 13 | 60-65 | Matrix Sample | Matrix | Matrix | AM13: column sample - no artifacts recovered | -- | 2L |
| **AM14** | -- | APRC3 | AM | 14 | 65-70 | Matrix Sample | Matrix | Matrix | AM14: column sample - no artifacts recovered | -- | 2L |
| **AM15** | -- | APRC3 | AM | 15 | 75-80 | Matrix Sample | Matrix | Matrix | AM15: column sample - no artifacts recovered | -- | 2L |
| **AN01** | 1 | BF1 | AN | 01 | 0-20 | Ceramic | Ceramic | Clay | AN01.01: maya-period ceramic sherd | 1 | 0.96 |
| **AN02** | 1 | BF2 | AN | 02 | 20-40 | Debitage | Flake | Chert | AN02.01: assorted debitage | 1 | 0.56 |
| **AO02** | 1 | APRC3 | AO | -- | -- | Biface | Flake Tool | Chert | AO02.01: patinated biface fragment from profile | 1 | 11.63 |
| **AO02** | 2 | APRC3 | AO | -- | -- | Biface | Flake Tool | Chert | AO01.02: probable Maya-period hafted, stemmed biface fragment from profile | 1 | 35.29 |
| **AO03** | 1 | APRC3 | AO | -- | -- | Debitage | Flake | Chert | AO03.01: assorted debitage from profile at ~60cmbs | 2 | 4.31 |
| **AO05** | 1 | APRC3 | AO | -- | -- | Uniface | Flake Tool | Chert | AO05.01: chunky uniface on probable reduced macroflake | 1 | 68.43 |
| **AO05** | 2 | APRC3 | AO | -- | -- | Debitage | Flake | Chert | AO05.02: grey banded chert debitage from profile | 1 | 14.29 |
| **AO06** | 1 | APRC3 | AO | -- | -- | Debitage | Flake | Chert | AO06.01: debitage collected from window-screen | 130 | 11.75 |
| **BA01** | 1 | BP | BA | 01 | 0-20 | Debitage | Flake(s) | Chert | Unit BA01.01: from 1/4" screen | 2 | 0.9 |
| **BA02** | 1 | BP | BA | 02 | 20-40 | Debitage | Flake(s) | Chert | Unit BA02.02: from 1/4" screen; heat damaged | 7 | 8.1 |
| **BA02** | 2 | BP | BA | 02 | 20-40 | Debitage | Flake Tool | Chert | Unit BA02.02: heat damaged; possible flake tool; reddish | 1 | 23.5 |
| **BA02** | 3 | BP | BA | 02 | 20-40 | Core | Core | Chert | Unit BA02.02: heat damaged; two potential cores; reduced; heavily patinated | 2 | 113.35 |
| **BA02** | 4 | BP | BA | 02 | 20-40 | Biface | Biface | Chert | Unit BA02.02: proximal chunky biface fragment | 1 | 27.65 |
| **BA03** | 2 | BP | BA | 03 | 52 | Uniface | Scraper | Chert | Unit BA03.02: heavily patinated, white uniface scraper | 1 | 15.3 |
| **BA03** | 1 | BP | BA | 03 | 40-60 | Debitage | Flake(s) | Chert | Unit BA03.01: from 1/4" screen | 4 | 16.69 |
| **BB01** | 1 | APRC4 | BB | 01 | 0-20 | Debitage | Flake(s) | Chert | Unit BB01.01: from 1/4" screen | 13 | 41.1 |
| **BB01** | 2 | APRC4 | BB | 01 | 0-20 | Ground-Pecked Stone | Ball | Metamorphic | Unit BB01.02: from 1/4" screen; max dimension 53.7mm | 1 | 206.55 |
| **BB02** | 1 | BP | BB | 02 | 20-40 | Debitage | Flake(s) | Chert | Unit BB02.01: from 1/4" screen | 18 | 30.6 |
| **BC01** | 1 | General APRC | BC | -- | Surface | Core | Blade | Chert | BC01.01: potential paleoindian blade core | 1 | 468.5 |
| **BC02** | 1 | FPR | BC | -- | Surface | Biface | Preform | Chert | BC02.01: broken, manufacturing failure; mx lgth - 74.9, wid - 47.2, thic - 13.1; mid-stage reduction | 1 | 50.36 |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BD01** | 1 | APRC4 | BD | 01 | 0-20 | Debitage | Flake(s) | Chert | Unit BD01.01: from 1/4" screen | 8 | 4.12 |
| **BD02** | 1 | APRC4 | BD | 02 | 20-40 | Debitage | Flake(s) | Chert | Unit BD02.01: from 1/4" screen | 52 | 137.29 |
| **BD02** | 1 | APRC4 | BD | 02 | 20-40 | Burned Rock | Burned Rock | Limestone | Unit BD02.02: from 1/4" screen | 1 | 75.21 |
| **BD03** | 1 | APRC4 | BD | 03 | 40-60 | Debitage | Flake(s) | Chert | Unit BD03.01: from 1/4" screen | 24 | 124.53 |
| **BD03** | 2 | APRC4 | BD | 03 | 40-60 | Biface | Point | Chert | Unit BD03.02: broken; medial paleoindian(?) fragment; serrated? | 1 | 3.98 |
| **BD03** | 3 | APRC4 | BD | 03 | 40-60 | Uniface | Flake Tool | Chert | Unit BD03.03:damaged with lateral edge retouch | 1 | 7.38 |
| **BD03** | 4 | APRC4 | BD | 03 | 40-60 | Burned Rock | Burned Rock | Chert | UnitBD03.04; from 1/4" screen | 1 | 10.76 |
| **BD04** | 1 | APRC4 | BD | 04 | 60-80 | Debitage | Flake(s) | Chert | UnitBD03.01: from 1/4" screen; +2 pc from cleaning | 21 | 70.64 |
| **BH** | 1 | SPMQ | BH | -- | -- | Ground-Pecked Stone | Hammerstone | Chert | BH: large hammerstone/ ground and pecked stone | 1 | 1058.63 |
| **BH** | 2 | SPMQ | BH | -- | -- | Debitage | Flake(s) | Chert | BH: from brown layer | 1 | 11.03 |
| **BH** | 3 | SPMQ | BH | -- | -- | Debitage | Flake(s) | Chert | BH: on top of hard clay | 8 | 3.58 |
| **BH** | 4 | SPMQ | BH | -- | -- | Debitage | Flake(s) | Chert | BH: profile cleaning | 1 | 0.99 |
| **BH** | 5 | SPMQ | BH | -- | -- | Debitage | Flake(s) | Chert | BH: around rock 6 | 2 | 0.94 |
| **BH** | 6 | SPMQ | BH | -- | -- | -- | Chunk | Quartzite | BH: chunk off of larger stone 8 | 1 | 250.97 |
| **BH** | 7 | SPMQ | BH | -- | -- | Manuport | | Quartzite | BH: possible wedge tool with small sample piece | 1 | 3560.54 |
| **BH** | 8 | SPMQ | BH | -- | -- | Biface | Adze | Chert | BH: banded adze tool in association with large stones | 1 | 208.96 |
| **BH** | 9 | SPMQ | BH | -- | -- | Debitage | Flake(s) | Chert | BH: large flake in association with large stones | 1 | 80.61 |
| **BH** | 10 | SPMQ | BH | -- | -- | Hammerstone | Hammerstone | Chert | BH: battered hammerstone in association with large stones | 1 | 330.06 |
| **BH** | 11 | SPMQ | BH | -- | -- | Stone | Stone | | BH11: geologic sample from stones | 2 | 24.44 |
| **BI01** | 1 | FPR | BI | 01 | 0-20 | Debitage | Flake(s) | Chert | UnitBI01.01: from 1/4" screen | 6 | 15.09 |
| **BI01** | 2 | FPR | BI | 01 | 0-20 | Core | Core | Chert | UnitBI01.02: from 1/4" screen; core fragment | 1 | 92.38 |
| **BI02** | 1 | FPR | BI | 02 | 20-40 | Debitage | Flake(s) | Chert | UnitBI02.01: from 1/4" screen | 50 | 105.6 |
| **BI02** | 2 | FPR | BI | 02 | 20-40 | Core | Core | Chert | UnitBI02.02: from 1/4" screen; core fragment | 1 | 60.42 |
| **BI03** | 1 | FPR | BI | 03 | 40-60 | Debitage | Flake(s) | Chert | UnitBI03.01: from 1/4" screen | 108 | 244.89 |
| **BI04** | 1 | FPR | BI | 04 | 60-80 | Debitage | Flake(s) | Chert | UnitBI04.01: from 1/4" screen | 22 | 39.95 |
| **BJ01** | 1 | FPR | BJ | 01 | 0-20 | Debitage | Flake(s) | Chert | UnitBJ01.01: from 1/4" screen | 14 | 21.02 |
| **BJ02** | 1 | FPR | BJ | 02 | 20-40 | Debitage | Flake(s) | Chert | UnitBJ02.01: from 1/4" screen | 86 | 115.86 |
| **BJ02** | 2 | FPR | BJ | 02 | 20-40 | Debitage | Flake Tool | Chert | UnitBJ02.02: from 1/4" screen; flake tool distal end; awl/graver style | 1 | 0.6 |
| **BJ03** | 1 | FPR | BJ | 03 | 40-60 | Debitage | Flake(s) | Chert | UnitBJ03.01: from 1/4" screen | 104 | 300.64 |
| **BJ03** | 2 | FPR | BJ | 03 | 40-60 | Debitage | Flake(s) | Chert | UnitBJ03.02: from 1/4" screen; possible burinated spalls/flakes | 3 | 15.49 |
| **BJ03** | 3 | FPR | BJ | 03 | 40-60 | Core | Core | Chert | UnitBJ03.03: broken core and/or hammerstone | 1 | 182.76 |
| **BJ04** | 1 | FPR | BJ | 04 | 60-80 | Debitage | Flake(s) | Chert | UnitBJ04.01: from 1/4" screen | 15 | 16.26 |
| **BK01** | 1 | FPR | BK | 01 | 0-20 | Debitage | Flake(s) | Chert | UnitBK01.01: from 1/4" screen | 19 | 49.17 |
| **BK02** | 1 | FPR | BK | 02 | 20-40 | Debitage | Flake(s) | Chert | UnitBK02.01: from 1/4" screen | 44 | 78.81 |
| **BK03** | 1 | FPR | BK | 03 | 40-60 | Debitage | Flake(s) | Chert | UnitBK03.01: from 1/4" screen | 51 | 91.01 |
| **BK04** | 1 | FPR | BK | 04 | 60-80 | Debitage | Flake(s) | Chert | UnitBK04.01: from 1/4" screen | 2 | 1.03 |
| **BL01** | 1 | FPR | BL | 01 | 0-20 | Debitage | Flake(s) | Chert | UnitBL01.01: from 1/4" screen | 7 | 7.28 |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BL02** | 1 | FPR | BL | 02 | 20-40 | Debitage | Flake(s) | Chert | UnitBL02.01: from 1/4" screen | 47 | 70.36 |
| **BL04** | 1 | FPR | BL | 04 | 60-80 | Debitage | Flake(s) | Chert | UnitBL04.01: from 1/4" screen | 12 | 23.35 |
| **BM06** | 1 | FPR | BM | 06 | 25-30 | Debitage | Flake(s) | Chert | UnitBM06.01: from fine screen column | 1 | 0.04 |
| **BM07** | 1 | FPR | BM | 07 | 30-35 | Debitage | Flake(s) | Chert | UnitBM07.01: from fine screen column | 2 | 0.04 |
| **BM08** | 1 | FPR | BM | 08 | 35-40 | Debitage | Flake(s) | Chert | UnitBM08.01: from fine screen column | 5 | 0.17 |
| **BM09** | 1 | FPR | BM | 09 | 40-45 | Debitage | Flake(s) | Chert | UnitBM09.01: from fine screen column | 5 | 0.19 |
| **BM10** | 1 | FPR | BM | 10 | 45-50 | Debitage | Flake(s) | Chert | UnitBM10.01: from fine screen column | 8 | 1.45 |
| **BM11** | 1 | FPR | BM | 11 | 50-55 | Debitage | Flake(s) | Chert | UnitBM11.01: from fine screen column | 2 | 0.13 |
| **BN01** | 1 | FPR | BN | 01 | 0-5 | Debitage | Flake(s) | Chert | UnitBN01.01: from fine screen column | 1 | 0.25 |
| **BN03** | 1 | FPR | BN | 03 | 10-15 | Debitage | Flake(s) | Chert | UnitBN03.01: from fine screen column | 1 | 0.01 |
| **BN04** | 1 | FPR | BN | 04 | 15-20 | Debitage | Flake(s) | Chert | UnitBN04.01: from fine screen column | 2 | 0.84 |
| **BN06** | 1 | FPR | BN | 06 | 25-30 | Debitage | Flake(s) | Chert | UnitBN06.01: from fine screen column | 3 | 0.08 |
| **BN07** | 1 | FPR | BN | 07 | 30-35 | Debitage | Flake(s) | Chert | UnitBN07.01: from fine screen column | 2 | 0.11 |
| **BN08** | 1 | FPR | BN | 08 | 35-40 | Debitage | Flake(s) | Chert | UnitBN08.01: from fine screen column | 3 | 0.88 |
| **BN09** | 1 | FPR | BN | 09 | 40-45 | Debitage | Flake(s) | Chert | UnitBN09.01: from fine screen column | 3 | 0.08 |
| **BN10** | 1 | FPR | BN | 10 | 45-50 | Debitage | Flake(s) | Chert | UnitBN10.01: from fine screen column | 2 | 0.65 |
| **BN11** | 1 | FPR | BN | 11 | 50-55 | Debitage | Flake(s) | Chert | UnitBN11.01: from fine screen column | 1 | 0.01 |
| **BO02** | 1 | FPR | BO | 02 | 5-10 | Debitage | Flake(s) | Chert | UnitBO02.01: from fine screen column | 1 | 0.01 |
| **BO04** | 1 | FPR | BO | 04 | 15-20 | Debitage | Flake(s) | Chert | UnitBO04.01: from fine screen column | 1 | 0.01 |
| **BO05** | 1 | FPR | BO | 05 | 20-25 | Debitage | Flake(s) | Chert | UnitBO05.01: from fine screen column | 2 | 0.01 |
| **BO06** | 1 | FPR | BO | 06 | 25-30 | Debitage | Flake(s) | Chert | UnitBO06.01: from fine screen column | 3 | 0.15 |
| **BO07** | 1 | FPR | BO | 07 | 30-35 | Debitage | Flake(s) | Chert | UnitBO07.01: from fine screen column | 3 | 0.12 |
| **BO08** | 1 | FPR | BO | 08 | 35-40 | Debitage | Flake(s) | Chert | UnitBO08.01: from fine screen column | 1 | 0.02 |
| **BO09** | 1 | FPR | BO | 09 | 40-45 | Debitage | Flake(s) | Chert | UnitBO09.01: from fine screen column | 5 | 3.91 |
| **BO10** | 1 | FPR | BO | 10 | 45-50 | Debitage | Flake(s) | Chert | UnitBO10.01: from fine screen column | 1 | 0.02 |
| **BO11** | 1 | FPR | BO | 11 | 50-55 | Debitage | Flake(s) | Chert | UnitBO11.01: from fine screen column | 3 | 0.33 |
| **CA01** | 1 | FPR | CA | 01 | -- | Debitage | Flake(s) | Chert | CA01. 01: from shovel test | 1 | 15.82 |
| **CA05** | 1 | FPR | CA | 05 | -- | Debitage | Flake(s) | Chert | CA05. 01: from shovel test | 1 | 0.2 |
| **CA07** | 1 | FPR | CA | 07 | -- | Debitage | Flake(s) | Chert | CA07. 01: from shovel test | 2 | 1.2 |
| **CA08** | 1 | FPR | CA | 08 | -- | Debitage | Flake(s) | Chert | CA08. 01: from shovel test | 1 | 0.2 |
| **CA10** | 1 | FPR | CA | 10 | -- | Debitage | Flake(s) | Chert | CA10. 01: from shovel test | 1 | 0.2 |
| **CA11** | 1 | FPR | CA | 11 | -- | Uniface | Scraper | Chert | CA11. 01: from shovel test; end scraper; apr material variant - speckled | 1 | 25.2 |
| **CA15** | 1 | FPR | CA | 15 | -- | Uniface | Flake Tool | Chert | CA15. 01: from shovel test | 1 | 24.4 |
| **CA19** | 1 | FPR | CA | 19 | -- | Debitage | Flake(s) | Chert | CA19. 01: from shovel test | 1 | 13.9 |
| **CB01** | 1 | TC/3C | CB | 01 | 0-20 | Debitage | Flake(s) | Chert | CB01.01: from 1/4"screen | 1 | 5.8 |
| **CB02** | 1 | TC/3C | CB | 02 | 20-40 | Debitage | Flake(s) | Chert | CB02.01: from 1/4"screen | 150 | 500.26 |
| **CB02** | 2 | TC/3C | CB | 02 | 20-40 | Core | Core | Chert | CB02.02: from 1/4"screen | 1 | 160.42 |
| **CB03** | 1 | TC/3C | CB | 03 | 40-60 | Debitage | Flake(s) | Chert | CB03.01: from 1/4"screen | 81 | 142.79 |
| **CB03** | 2 | TC/3C | CB | 03 | 40-60 | Core | Core | Chert | CB03.02: from 1/4"screen | 1 | 102.52 |
| **CB03** | 3 | TC/3C | CB | 03 | 40-60 | Debitage | Flake Tool | Chert | CB03.03: from 1/4"screen | 1 | 38 |
| **CB03** | 4 | TC/3C | CB | 03 | 40-60 | Debitage | Flake(s) | Chert | CB03.04: from 1/4"screen; APR purple present | 1 | 33.79 |
| **CB03** | 5 | TC/3C | CB | 03 | 40-60 | Core | Core | Chert | CB03.05: from 1/4"screen; APR purple | 1 | 88.51 |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CB04** | 1 | TC/3C | CB | 04 | 60-80 | Debitage | Flake(s) | Chert | CB04. 01: from 1/4"screen | 41 | 150.66 |
| **CB04** | 2 | TC/3C | CB | 04 | 60-80 | Burned Rock | Burned Rock | Limestone | CB04. 02: from 1/4"screen | 1 | 22.39 |
| **CB04** | 3 | TC/3C | CB | 04 | 60-80 | Core | Core | Chert | CB04. 03: from 1/4"screen; discoidal flake core | 1 | 113.72 |
| **CB05** | 1 | TC/3C | CB | 05 | 80-100 | Core | Core | Chert | CB05. 01: from 1/4"screen; pedalstaled at bottom of unit; ; APR purple present | 1 | 435.44 |
| **CB05** | 2 | TC/3C | CB | 05 | 80-100 | Core | Core | Chert | CB05. 02: from 1/4"screen; pedalstaled at bottom of unit; APR Purple | 1 | 639.46 |
| **CB05** | 3 | TC/3C | CB | 05 | 80-100 | Debitage | Flake(s) | Chert | CB05. 03: from 1/4"screen; APR purple present | 11 | 33.75 |
| **CB06** | 1 | TC/3C | CB | 06 | 100-120 | Debitage | Flake(s) | Chert | CB06. 01: from 1/4"screen; APR purple present | 13 | 3.2 |
| **CB07** | 1 | TC/3C | CB | -- | -- | Matrix Sample | Matrix Sample | Matrix | CB07.01: texture sample - Unit 5 | 1 | 229.61 |
| **CB07** | 2 | TC/3C | CB | -- | -- | Matrix Sample | Matrix Sample | Matrix | CB07.02: texture sample - Unit 4 | 1 | 258.95 |
| **CB07** | 3 | TC/3C | CB | -- | -- | Matrix Sample | Matrix Sample | Matrix | CB07.03: texture sample - Unit 4b | 1 | 192.63 |
| **CB07** | 4 | TC/3C | CB | -- | -- | Matrix Sample | Matrix Sample | Matrix | CB07.04: texture sample - Unit 3 | 1 | 247.87 |
| **CB07** | 5 | TC/3C | CB | -- | -- | Matrix Sample | Matrix Sample | Matrix | CB07.05: texture sample - Unit 2 | 1 | 156.68 |
| **CB07** | 6 | TC/3C | CB | -- | -- | Matrix Sample | Matrix Sample | Matrix | CB07.06: texture sample - Unit 1 | 1 | 200.73 |
| **CB08** | 1 | TC/3C | CB | -- | -- | OSL | Matrix Sample | Matrix | CB08.01: OSL samples 1.1 & 1.2 with paired sediment sample | 2 | 987.6 |
| **CB08** | 2 | TC/3C | CB | -- | -- | OSL | Matrix Sample | Matrix | CB08.02: OSL samples 2.1 & 2.2 with paired sediment sample | 2 | 1018.83 |
| **CB08** | 3 | TC/3C | CB | -- | -- | OSL | Matrix Sample | Matrix | CB08.03: OSL samples 3.1 & 3.2 with paired sediment sample | 2 | 1111.53 |
| **CB08** | 4 | TC/3C | CB | -- | -- | OSL | Matrix Sample | Matrix | CB08.04: OSL samples 4.1 & 4.2 with paired sediment sample | 2 | 1233.18 |
| **CB09** | 1 | TC/3C | CB | -- | -- | Micromorph | Matrix Sample | Matrix | CB09.01: Micromorph CB.MM-1 | 1 | 618.95 |
| **CB09** | 2 | TC/3C | CB | -- | -- | Micromorph | Matrix Sample | Matrix | CB09.02: Micromorph CB.MM-2 | 1 | 616.16 |
| **CB09** | 3 | TC/3C | CB | -- | -- | Micromorph | Matrix Sample | Matrix | CB09.03: Micromorph CB.MM-3 | 1 | 597.82 |
| **CB09** | 4 | TC/3C | CB | -- | -- | Micromorph | Matrix Sample | Matrix | CB09.04: Micromorph CB.MM-4 | 1 | 580.25 |
| **CB09** | 5 | TC/3C | CB | -- | -- | Micromorph | Matrix Sample | Matrix | CB09.05: Micromorph CB.MM-5 | 1 | 587.5 |
| **CB09** | 6 | TC/3C | CB | -- | -- | Micromorph | Matrix Sample | Matrix | CB09.06: Micromorph CB.MM-6 | 1 | 584.82 |
| **CC01** | 1 | TC/3C | CC | 01 | 0-20 | Debitage | Flake Tool | Chert | CC01.01: from 1/4"screen | 1 | 13.42 |
| **CC01** | 2 | TC/3C | CC | 01 | 0-20 | Debitage | Flake(s) | Chert | CC01.02: from 1/4"screen | 75 | 174.61 |
| **CC01** | 3 | TC/3C | CC | 01 | 0-20 | Core | Core | Chert | CC01.03: from 1/4"screen | 1 | 34.31 |
| **CC02** | 1 | TC/3C | CC | 02 | 20-40 | Debitage | Flake(s) | Chert | CC02.01: from 1/4"screen; 3 bags; APR purple present | 308 | 553.75 |
| **CC02** | 2 | TC/3C | CC | 02 | 20-40 | Debitage | Flake Tool | Chert | CC02.02: from 1/4"screen | 1 | 40.73 |
| **CC03** | 1 | TC/3C | CC | 03 | 40-60 | Debitage | Flake(s) | Chert | CC03.01: from 1/4"screen; 4 bags | 272 | 660.76 |
| **CC03** | 2 | TC/3C | CC | 03 | 40-60 | Core | Core | Chert | CC03.02: from 1/4"screen | 1 | 110.62 |
| **CC03** | 3 | TC/3C | CC | 03 | 40-60 | Core | Core | Chert | CC03.03: from 1/4"screen | 1 | 39.89 |
| **CC03** | 4 | TC/3C | CC | 03 | 40-60 | Debitage | Flake Tool | Chert | CC03.04: from 1/4"screen | 1 | 83.01 |
| **CC03** | 5 | TC/3C | CC | 03 | 40-60 | Core | Core | Chert | CC03.05: from 1/4"screen | 1 | 102.16 |
| **CD01** | 1 | TC/3C | CD | 01 | 0-20 | Debitage | Flake(s) | Chert | CD01.01: from 1/4"screen | 15 | 26.6 |
| **CD02** | 1 | TC/3C | CD | 02 | 20-40 | Debitage | Flake(s) | Chert | CD02.01: from 1/4"screen | 570 | 886.5 |
| **CD02** | 2 | TC/3C | CD | 02 | 20-40 | Uniface | Flake Tool | Chert | CD02.02: from 1/4"screen | 1 | 26.4 |
| **CD02** | 3 | TC/3C | CD | 02 | 20-40 | Uniface | Flake Tool | Chert | CD02.03: from 1/4"screen | 1 | 18.8 |
| **CD02** | 4 | TC/3C | CD | 02 | 20-40 | Biface | Biface | Chert | CD02.04: from 1/4"screen | 1 | 17.3 |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CD02** | 5 | TC/3C | CD | 02 | 20-40 | Core | Core | Chert | CD02.05: from 1/4"screen | 1 | 53.3 |
| **CD03** | 1 | TC/3C | CD | 03 | 40-60 | Debitage | Flake(s) | Chert | CD03.01: from 1/4"screen | 368 | 718.3 |
| **CD03** | 2 | TC/3C | CD | 03 | 40-60 | Uniface | Flake Tool | Chert | CD03.02: from 1/4"screen | 1 | 29.7 |
| **CD03** | 3 | TC/3C | CD | 03 | 40-60 | Uniface | Flake Tool | Chert | CD03.03: from 1/4"screen | 1 | 17.4 |
| **CD03** | 4 | TC/3C | CD | 03 | 40-60 | Uniface | Flake Tool | Chert | CD03.04: from 1/4"screen | 1 | 13.9 |
| **CD03** | 5 | TC/3C | CD | 03 | 40-60 | Core | Core | Chert | CD03.05: from 1/4"screen | 1 | 27.4 |
| **CD03** | 6 | TC/3C | CD | 03 | 40-60 | Debitage | Chunk | Chert | CD03.06: from 1/4"screen | 1 | 18.3 |
| **CD03** | 7 | TC/3C | CD | 03 | 40-60 | Debitage | Chunk | Chert | CD03.07: from 1/4"screen | 1 | 11.1 |
| **CD04** | 1 | TC/3C | CD | 04 | 60-80 | Debitage | Flake(s) | Chert | CD04.01: from 1/4"screen | 12 | 7.6 |
| **CD05** | 1 | TC/3C | CD | 05 | 80-100 | Debitage | Flake(s) | Chert | CD05.01: from 1/4"screen | 2 | 1.9 |
| **CD06** | 1 | TC/3C | CD | 06 | 100-120 | Debitage | Flake(s) | Chert | CD06.01: from 1/4"screen | 1 | 1.2 |
| **CE03** | 1 | FPR | CE | 03 | 66 | Debitage | Flake(s) | Chert | CE03.01: from 1/4"screen | 1 | 5.4 |
| **CE10** | 1 | FPR | CE | 03 | 50 | Debitage | Flake(s) | Chert | CE10.01: from 1/4"screen | 1 | 1.4 |
| **CE15** | 1 | FPR | CE | 03 | 69 | Debitage | Flake(s) | Chert | CE15.01: from 1/4"screen | 1 | 0.4 |
| **CE16** | 1 | FPR | CE | 03 | 76 | Debitage | Flake(s) | Chert | CE16.01: from 1/4"screen | 1 | 0.1 |
| **CE18** | 1 | FPR | CE | 03 | 64 | Debitage | Flake(s) | Chert | CE18.01: from 1/4"screen | 1 | 5.7 |
| **CE25** | 1 | FPR | CE | 03 | 61 | Debitage | Flake(s) | Chert | CE25.01: from 1/4"screen | 1 | 4.8 |
| **CE27** | 1 | FPR | CE | 03 | 58 | Debitage | Flake(s) | Chert | CE27.01: from 1/4"screen | 1 | 4.5 |
| **CE28** | 1 | FPR | CE | 03 | 58 | Debitage | Flake(s) | Chert | CE28.01: from 1/4"screen | 1 | 18.1 |
| **CE29** | 1 | FPR | CE | 03 | 59 | Debitage | Flake(s) | Chert | CE29.01: from 1/4"screen | 2 | 6.1 |
| **CE37** | 1 | FPR | CE | 03 | 70 | Debitage | Flake(s) | Chert | CE37.01: from 1/4"screen | 6 | 16.6 |
| **CE37** | 2 | FPR | CE | 03 | 70 | Core | Core | Chert | CE37.02: from 1/4"screen | 1 | 77.1 |
| **CE44** | 1 | FPR | CE | 03 | 40-60 | Debitage | Flake(s) | Chert | CE44.01: from 1/4"screen | 1 | 4.4 |
| **CF01** | 1 | APRC5 | CF | 01 | 0-20 | Debitage | Flake(s) | Chert | CF01.01: from 1/4"screen | 11 | 25.3 |
| **CF01** | 2 | APRC5 | CF | 01 | 0-20 | Uniface | Flake Tool | Chert | CF01.02: from 1/4"screen | 1 | 46.8 |
| **CF02** | 1 | APRC5 | CF | 02 | 20-40 | Debitage | Flake(s) | Chert | CF02.01: from 1/4"screen | 7 | 2.7 |
| **CF02** | 2 | APRC5 | CF | 02 | 20-40 | Faunal | Shell | Shell | CF02.02: from 1/4"screen | 2 | 0.2 |
| **CF03** | 1 | APRC5 | CF | 03 | 40-60 | Debitage | Flake(s) | Chert | CF03.01: from 1/4"screen | 14 | 25.4 |
| **CF04** | 1 | APRC5 | CF | 04 | 60-80 | Debitage | Flake(s) | Chert | CF04. 01: from 1/4"screen; APR purple present | 11 | 29.9 |
| **CF04** | 2 | APRC5 | CF | 05 | 60-80 | Faunal | Shell | Shell | CF04. 02: from 1/4"screen | 5 | 0.1 |
| **CG01** | 1 | APRC | CG | 01 | 58-80 | Debitage | Flake(s) | Chert | CG01.01: from 1/4"screen | 12 | 20.8 |
| **CG02** | 1 | APRC | CG | 02 | 80-100 | Debitage | Flake(s) | Chert | CG02.01: from 1/4"screen | 1 | 0.8 |
| **CH01** | 1 | APRC | CH | 01 | 0-20 | Debitage | Flake(s) | Chert | CH01. 01: from 1/4"screen | 11 | 13 |
| **CH01** | 2 | APRC | CH | 01 | 0-20 | Groundstone | Groundstone | Quartzite | CH01. 02: from 1/4"screen | 1 | 66 |
| **CH02** | 1 | APRC | CH | 02 | 20-50/55 | Debitage | Flake(s) | Chert | CH02. 01: from 1/4"screen | 1 | 7.2 |
| **CH03** | 1 | APRC | CH | 03 | 50/55-60 | Debitage | Flake(s) | Chert | CH03. 01: from 1/4"screen | 1 | 32.7 |
| **CI02** | 1 | APRC | CI | 02 | 20-40 | Debitage | Flake(s) | Chert | CI02. 01: from 1/4"screen | 1 | 3.2 |
| **CI04** | 1 | APRC | CI | 04 | 60-80 | Uniface | Scraper | Chert | CI04. 01: from 1/4"screen | 1 | 43.8 |
| **CJ01** | 1 | APRC3 | CJ | 01 | 0-40 | Biface | Adze | Chert | CJ01.01: from 1/4"screen; mayan | 1 | 103.6 |
| **CJ02** | 1 | APRC3 | CJ | 02 | 40-60 | Debitage | Flake(s) | Chert | CJ02.01: from 1/4"screen | 32 | 74.57 |
| **CJ03** | 1 | APRC3 | CJ | 03 | 60-80 | Debitage | Flake(s) | Chert | CJ03.01: from 1/4"screen | 53 | 44.6 |
| **CJ04** | 1 | APRC3 | CJ | 04 | 80-100 | Debitage | Flake(s) | Chert | CJ04.01: from 1/4"screen | 7 | 2.19 |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CJ04** | 2 | APRC3 | CJ | 04 | 80-100 | Uniface | Flake Tool | Chert | CJ04.02: from 1/4"screen | 1 | 20.35 |
| **CK01** | 1 | APRC | CK | 01 | 0-40 | Debitage | Flake(s) | Chert | CK01.01: from 1/4"screen | 43 | 151.5 |
| **CK01** | 2 | APRC | CK | 01 | 0-40 | Uniface | Blade | Chert | CK01.02: from 1/4"screen; pointed retouched blade | 1 | 70.2 |
| **CK02** | 1 | APRC | CK | 02 | 40-60 | Debitage | Flake(s) | Chert | CK02.01: from 1/4"screen | 22 | 15.19 |
| **CK02** | 2 | APRC | CK | 02 | 40-60 | Debitage | Flake Tool | Chert | CK02.02: from 1/4"screen | 1 | 12.49 |
| **CK02** | 3 | APRC | CK | 02 | 40-60 | Uniface | Constricted Adze | Chert | CK02.03: from 1/4"screen; broken | 1 | 30.31 |
| **CK03** | 1 | APRC | CK | 03 | 40-60 | Biface | Biface | Chert | CK03.01: from 1/4"screen; broken; distal | 1 | 15.95 |
| **CL** | 1 | APRC | CL | -- | Surface | Groundstone | Stone | Metamorphic | CL.01: surface collection; stone bowl fragment; colllected near CM | 1 | 268.36 |
| **CL** | 2 | APRC | CL | -- | Surface | Core | Hammerstone | Chert | CL.02: surface colllected between APRC and TC/3C in road; several flake removals; APR purple | 1 | 159.07 |
| **CL** | 3 | APRC | CL | -- | Surface | Uniface | Scraper | Chert | CL.03: from 1/4"screen; broken | 1 | 19.19 |
| **CL** | 4 | APRC | CL | -- | Surface | Debitage | Macroflake | Chert | CL.04: cortical removal; found near CM | 1 | 122.1 |
| **CL** | 5 | APRC | CL | -- | Surface | Biface | Preform | Chert | CL.05: from 1/4"screen; broken; APR purple; found near CN | 1 | 25.7 |
| **CM01** | 1 | APRC | CM | 01 | 0-20 | Debitage | Flake(s) | Chert | CM01.01: from 1/4"screen | 11 | 7.4 |
| **CM01** | 2 | APRC | CM | 01 | 0-20 | Debitage | Flake Tool | Chert | CM01.02: from 1/4"screen | 1 | 56.2 |
| **CM02** | 1 | APRC | CM | 02 | 20-40 | Debitage | Flake(s) | Chert | CM02.01: from 1/4"screen | 12 | 35.3 |
| **CM02** | 2 | APRC | CM | 02 | 20-40 | Core | Core | Chert | CM02.02: from 1/4"screen | 1 | 12.1 |
| **CM04** | 1 | APRC | CM | 04 | 60-90 | Debitage | Flake(s) | Chert | CM04.01: from 1/4"screen; APR purple present | 24 | 42.96 |
| **CN01** | 2 | APRC | CM | 01 | 30-40 | Ceramic | Ceramic | Clay | CN01.02: from 1/4"screen | 3 | 6 |
| **CN01** | 1 | APRC | CM | 01 | 30-40 | Debitage | Flake(s) | Chert | CN01.01: from 1/4"screen | 40 | 95.7 |
| **CN02** | 1 | APRC | CM | 02 | 40-60 | Debitage | Flake(s) | Chert | CN02.01: from 1/4"screen; APR purple present | 15 | 48.54 |
| **CN03** | 1 | APRC | CM | 03 | 60-80 | Debitage | Flake(s) | Chert | CN03.01: from 1/4"screen; APR purple present | 10 | 13.17 |
| **CN04** | 1 | APRC | CM | 04 | 80-end | Debitage | Flake(s) | Chert | CN04.01: from 1/4"screen; APR purple present | 5 | 2.72 |
| **CO01** | 1 | APRC | CO | 01 | 0-40 | Debitage | Flake(s) | Chert | CO01.01: from 1/4"screen | 76 | 59.45 |
| **CO01** | 2 | APRC | CO | 01 | 0-40 | Ceramic | Ceramic | Clay | CO01.02: from 1/4"screen; mayan | 2 | 4.29 |
| **CO03** | 1 | APRC | CO | 03 | 60-80 | Debitage | Flake(s) | Chert | CO03.01: from 1/4"screen; APR purple present | 40 | 48.86 |
| **CO03** | 2 | APRC | CO | 03 | 60-80 | Debitage | Flake Tool | Chert | CO03.02: from 1/4"screen; APR purple present | 1 | 8.73 |
| **CO03** | 3 | APRC | CO | 03 | 60-80 | Core | Core | Chert | CO03.03: from 1/4"screen | 1 | 162.08 |
| **CO04** | 1 | APRC | CO | 04 | 80-100 | Debitage | Flake Tool | Chert | CO04.01: from 1/4"screen; APR purple present | 7 | 39.14 |
| **CP01** | 2 | APRC | CP | 01 | 0-40 | Ceramic | Ceramic | Clay | CP01.02: from 1/4"screen; mayan | 10 | 62.74 |
| **CP01** | 1 | APRC | CP | 01 | 0-40 | Debitage | Flake(s) | Chert | CP01.01: from 1/4"screen; APR purple present | 16 | 90.03 |
| **CP02** | 1 | APRC | CP | 02 | 40-60 | Debitage | Flake(s) | Chert | CP02.01: from 1/4"screen; APR purple present | 66 | 67.47 |
| **CP02** | 2 | APRC | CP | 02 | 40-60 | Ceramic | Ceramic | Clay | CP02. 02: from 1/4"screen | 4 | 35.77 |
| **CP02** | 3 | APRC | CP | 02 | 40-60 | Uniface | Flake Tool | Chert | CP02. 03: from 1/4"screen | 1 | 9.3 |
| **CP02** | 4 | APRC | CP | 02 | 40-60 | Stone | Stone | Petrified Wood | CP02. 04: from 1/4"screen | 1 | 327.54 |
| **CP03** | 1 | APRC | CP | 03 | 60-80 | Debitage | Flake(s) | Chert | CP03.01: from 1/4"screen; APR purple present | 61 | 60.03 |
| **CP03** | 2 | APRC | CP | 03 | 60-80 | Uniface | Flake Tool | Chert | CP03.02: from 1/4"screen | 1 | 1.45 |
| **CP04** | 1 | APRC | CP | 04 | 80-100 | Debitage | Flake(s) | Chert | CP04.01: from 1/4"screen; APR purple present | 20 | 10.53 |

| Lot # | Specimen Number (SN) | Excavation Area | Excavation Unit | Layer | Depth (cmbs) | Class | Category | Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CP05** | 1 | APRC | CP | -- | Wall cleanup | Debitage | Flake(s) | Chert | CP05.01: from 1/4"screen; APR purple present | 1 | 0.85 |
| **CP06** | 1 | APRC | CP | -- | -- | Matrix Sample | Matrix | Matrix | CP06.01: texture sample - Unit 4 | 1 | 185.11 |
| **CP06** | 2 | APRC | CP | -- | -- | Matrix Sample | Matrix | Matrix | CP06.02: texture sample - Unit 3 | 1 | 212.67 |
| **CP06** | 3 | APRC | CP | -- | -- | Matrix Sample | Matrix | Matrix | CP06.03: texture sample - Unit 2 | 1 | 236.86 |
| **CP06** | 4 | APRC | CP | -- | -- | Matrix Sample | Matrix | Matrix | CP06.04: texture sample - Unit 1 | 1 | 171.45 |
| **CP06** | 5 | APRC | CP | -- | -- | Stone | Stone | Sedimentary | CP06.05: from 1/4"screen; gravel sample | -- | 88.44 |
| **CP07** | 1 | APRC | CP | -- | -- | OSL | Matrix | Matrix | CP07.01: OSL sample with paired sediment sample | 1 | 827.42 |
| **CQ01** | 1 | APRC | CQ | 01 | 0-40 | Debitage | Flake(s) | Chert | CQ01.01: from 1/4"screen; APR purple present | 6 | 101.5 |
| **CQ02** | 1 | APRC | CQ | 02 | 40-60 | Debitage | Flake(s) | Chert | CQ02.01: from 1/4"screen; APR purple present | 25 | 154.1 |
| **CQ02** | 2 | APRC | CQ | 02 | 40-60 | Burned Rock | Burned Rock | Limestone | CQ02.02: from 1/4"screen | 1 | 18.4 |
| **CQ03** | 1 | APRC | CQ | 03 | 60-80 | Debitage | Flake(s) | Chert | CQ03.01: from 1/4"screen; APR purple present | 101 | 115.4 |
| **CQ03** | 2 | APRC | CQ | 03 | 60-80 | Uniface | Graver | Chert | CQ03.02: from 1/4"screen | 1 | 5.7 |
| **CQ04** | 1 | APRC | CQ | 04 | 80-90 | Debitage | Flake(s) | Chert | CQ04.01: from 1/4"screen; APR purple present | 3 | 1.62 |
| **CR01** | 1 | APRC | CR | 01 | 0-40 | Debitage | Flake(s) | Chert | CR01.01: from 1/4"screen | 18 | 16.7 |
| **CR01** | 2 | APRC | CR | 01 | 0-40 | Uniface | Macroblade | Chert | CR01.02: from 1/4"screen | 1 | 154.3 |
| **CR01** | 3 | APRC | CR | 01 | 0-40 | Core | Core | Chert | CR01.03: from 1/4"screen | 1 | 127.2 |
| **CR02** | 1 | APRC | CR | 02 | 40-60 | Debitage | Flake(s) | Chert | CR02.01: from 1/4"screen; APR purple; finishing flakes? | 39 | 186.3 |
| **CR03** | 1 | APRC | CR | 03 | 60-80 | Debitage | Flake(s) | Chert | CR03.01: from 1/4"screen; APR purple; finishing flakes? | 20 | 24.56 |
| **CR03** | 2 | APRC | CR | 03 | 60-80 | Uniface | Scraper | Chert | CR03.02: from 1/4"screen; APR purple; end scraper, broken | 1 | 12.7 |

# Appendix B. Borrowed Inventory: 2023-2025

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **BF001** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Proximal-Medial Fluted | Chert | medial-proximal; manufacturing failure; clovis-y | 1 | 23.75 |
| **CC001** | 0001 | Archaic | Sawmill | Biface, Point, Complete | Stemmed | Chert | complete point; slight resharpened | 1 | 12.02 |
| **CC002** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | complete | 1 | 33.85 |
| **CC003** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Complete | Stemmed Retouched | Chert | broken tip but complete; resharpened | 1 | 10.82 |
| **CC004** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | complete | 1 | 54.11 |
| **CC005** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Complete | Stemmed | Chert | patinated orange; medial notching; distal bevel | 1 | 30.92 |
| **CC006** | 0001 | | -- | Macroflake, Flake Tool, Complete | -- | Chert | broken, missing platform | 1 | 49.6 |
| **CC007** | 0001 | | -- | Biface, Tool, Broken | -- | Chert | broken, medial fragment | 1 | 33.04 |
| **CC008** | 0001 | Archaic | -- | Ground-Pecked, Ball, Complete | -- | Metamorphic | 5.5cm x 6cm; sort of beat up on one side | 1 | 245.1 |
| **DC001** | 0001 | Paleoindian | -- | Biface, Broken, Broken | Distal | Chert | Tip fragment; showed back up in may as a JT collection; | 1 | -- |
| **DC003** | 0001 | Paleoindian | -- | Biface, Broken, Broken | Medial-Distal | Chert | Medial-distal fragment; showed back up in may as a JT collection | 1 | -- |
| **DC004** | 0001 | Paleoindian | -- | Biface, Broken, Broken | Proximal | Chert | Preform; showed back up in may as a JT collection | 1 | -- |
| **DC005** | 0001 | Paleoindian | -- | Point, Broken, Broken | -- | Chert | Completed point, shovel fracture in tip quadrant. *Recatalogued as 0067 on 3-24-2023 | 1 | -- |
| **DC006** | 0001 | Paleoindian | -- | Point, Broken, Broken | -- | Chert | Fishtail, fractured at mid-blade and mid-stem; showed back up in may as a JT collection | 1 | -- |
| **DC007** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Waisted | Chert | waisted fluted; complete; heavily resharpened | 1 | 8.39 |
| **DC008** | 0001 | Paleoindian | Clovis-y | Biface, Point, Broken | Medial | Chert | broken; ground; base is broken and missing distal | 1 | 27.08 |
| **DC009** | 0001 | Archaic | Lowe | Biface, Point, Broken | -- | Chert | Repaired modern mid-blade fractures | 1 | 40.56 |
| **DC010** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed | Chert | stem snap and distal tip impact fracture; modern shovel nicks on blade. | 1 | 27.18 |
| **DC011** | 0001 | Archaic | Lowe | Biface, Point, Broken | Medial-Distal Stemmed | Chert | Mid-blade perverse fracture. | 1 | 27.01 |
| **DC012** | 0001 | Archaic | Lowe | Biface, Point, Broken | Medial Stemmed | Chert | stem snap and distal tip impact fracture. | 1 | 270 |
| **DC013** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Complete | -- | Chert | unfluted; made on a flake | 1 | 14.54 |
| **DC014** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | Proximal Fluted Waisted | Chert | basal fragment; waisted fluted; finished; made on a flake | 1 | 5.68 |
| **DC015** | 0001 | Paleoindian? | -- | Uniface, Scraper, Complete | -- | Chert | possible scraper; possibly made on a blade | 1 | 6.55 |
| **DC016** | 0001 | Paleoindian | Unfluted Lanceolate | Biface, Point, Complete | Unfluted | Chert | complete | 1 | 8.62 |
| **DC017** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed | Chert | burned; missing shoulder | 1 | 34.45 |
| **DC018** | 0001 | Archaic? | -- | Ground-Pecked, --, -- | -- | Metamorphic | pointed stone | 1 | 43.93 |
| **DC019** | 0001 | Maya | -- | Biface, Point, -- | Stemmed | Chert | missing distal tip and broken stem | 1 | -- |
| **DC020** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | complete | 1 | 62.94 |
| **DC021** | 0001 | Archaic? | -- | Debitage, Chunk, -- | -- | Obsidian | chunky debitage | 2 | 15.79 |
| **DC022** | 0001 | Maya | -- | Biface, Point, -- | -- | Chert | side notched | 1 | -- |
| **DC023** | 0001 | Maya | -- | Biface, Point, -- | -- | Chert | side notched | 1 | -- |
| **DC024** | 0001 | Archaic? | -- | Ground-Pecked, Ball, -- | -- | Metamorphic | round marble shaped stone; pinkish; max diameter 29.0mm | 1 | 34.87 |
| **DC025** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Waisted | Chert | Complete; waisted fluted | 1 | 20.13 |
| **DC026** | 0001 | Archaic | Lowe | Biface, Point, Complete | 90% Stemmed Retouched | Chert | distal tip missing; resharpened | 1 | 51.71 |
| **DC027** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted | Chert | light distal resharpening | 1 | 21.28 |
| **DC028** | 0001 | Paleoindian | Fishtail | Biface, Point, Complete | Proximal-Medial Fluted Waisted | Chert | manufacturing failure; not ground | 1 | 10.23 |
| **DC029** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Waisted | Chert | APR purple variant? | 1 | 23.18 |

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **ER001** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal-Medial Fluted | Chert | broken, missing base; on flake; fluting failure | 1 | 38.64 |
| **ER002** | 0001 | Paleoindian | -- | Uniface, Scraper, Broken | Proximal-Medial | Chert | translucent, lateral edge work; broken | 1 | 11.53 |
| **ER003** | 0001 | Archaic | Lowe | Biface, Point, Broken | 0.9 Stemmed | Chert | distal end damaged; one ear is broken | 1 | 57.89 |
| **ER004** | 0001 | Archaic? | -- | Ground-Pecked, Stone Bowl, -- | -- | Metamorphic | gray, deep stone bowl | 1 | -- |
| **ER005** | 0001 | Archaic | Lowe | Biface, Preform, Complete | -- | Chert | cortex present 100% on dorsal; partial cortex on ventral | 1 | 427.3 |
| **ER006** | 0001 | Archaic? | -- | Ground-Pecked, Ball, -- | -- | Metamorphic | light gray ball | 1 | 100.72 |
| **ER007** | 0001 | Archaic | -- | Blade, Macroblade, Complete | -- | Chert | unifacially trimmed | 1 | 213.92 |
| **ER008** | 0001 | Archaic? | -- | Ground-Pecked, Large Cobble, -- | -- | Metamorphic | black and tan banded metamorphic; polished | 1 | 270.43 |
| **ER009** | 0001 | Paleoindian | -- | Macroflake, Flake Tool, Complete | Thinning | Chert | Unifacially modified biface thinning flake | 1 | 122.4 |
| **ER010** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Retouched | Chert | heavily sharpened | 1 | 8.75 |
| **ER011** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | 90% Fluted | Chert | missing one basal ear; missing distal tip | 1 | 10.13 |
| **ER012** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed Retouched | Chert | missing distal tip; heavily resharpened | 1 | 35.77 |
| **ER013** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | cortex on ventral | 1 | 60.1 |
| **ER014** | 0001 | Archaic | Lowe | Biface, Preform, Complete | -- | Chert | reduction phase bevel | 1 | 131.39 |
| **ER015** | 0001 | Paleoindian | -- | Uniface, Scraper, -- | -- | Chert | end scraper; complete | 1 | 30.48 |
| **ES001** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | Proximal-Medial Fluted Waisted | Chert | broken; wide | 1 | 20.21 |
| **ES002** | 0001 | Paleoindian | Clovis-y | Biface, Point, Complete | Fluted | Chert | Possible reworked medial-distal fragment; made off a flake | 1 | 11.32 |
| **ES003** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Waisted | Chert | made on a flake; mid-blade nick | 1 | 14.2 |
| **ES004** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal-Medial Fluted | Chert | Mid-blade perverse fracture; fluted on both sides | 1 | 24.56 |
| **ES005** | 0001 | Archaic | Lowe | Biface, Point, -- | Stemmed | Chert | Both barbs missing. Nicks on stem. | 1 | 55.29 |
| **ES006** | 0001 | Maya | -- | Biface, Point, Complete | Stemmed | Chalcedony | Laurel-leaf shaped biface; tip and end of stem missing. Clear chalcedony? | 1 | 36.46 |
| **ES007** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | Retouched | Chert | unifacial scraper | 1 | 10.9 |
| **ET001** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | Pristine. Small nick on one barb. Eder Torres | 1 | 41.21 |
| **FT001** | 0001 | Archaic | -- | Biface, Point, Broken | 90% Stemmed | Chert | broken stem; indeteminant | 1 | 44.97 |
| **HR001** | 0001 | Maya | -- | Blade, Macroblade, -- | -- | Chert | unifacially retouched | 1 | -- |
| **HR002** | 0001 | Maya? | -- | Blade, Macroblade, -- | Stemmed | Chert | stemmed | 1 | -- |
| **HR003** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Proximal-Medial Fluted | Chert | broken preform; missing distal; manufacturing failure; fluting platform setup | 1 | 56.97 |
| **HR004** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Complete | Stemmed | Chert | stemmed; very last bit of the tip is broken | 1 | 20.96 |
| **HR005** | 0001 | Paleoindian | Lancelolate Fluted | Biface, Point, Broken | Proximal-Medial Fluted | Chert | broken; black spots | 1 | 30.18 |
| **HR006** | 0001 | Archaic | Lowe-like | Biface, Point, Complete | Stemmed | Chert | allspice characteristics | 1 | 16.97 |
| **IB001** | 0001 | Paleoindian | Unfluted Lanceolate | Biface, Point, Broken | Proximal-Medial Unfluted | Chert | Medial-proximal fragment, thick unfluted lanceolate | 1 | 15.11 |
| **IB002** | 0001 | Paleoindian | Unfluted Lanceolate | Biface, --, Broken | Proximal-Medial Unfluted | Chert | Medial-proximal fragment, thick unfluted lanceolate | 1 | 52.84 |
| **IB003** | 0001 | Paleoindian | -- | Biface, Point, Broken | Distal | Chert | indeterminant distal tip; incomp measurements | 1 | 8.28 |
| **IB004** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Complete | -- | Chert | Preform; tabular edge | 1 | 34.09 |
| **IB005** | 0001 | Paleoindian | Fishtail | Biface, Point, Broken | Proximal Fluted | Chert | Broken fluted base; ground; use failure | 1 | 10.04 |

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **IB006** | 0001 | Archaic | -- | Uniface, Macroblade, Complete | -- | Chert | intensive flaking; probable use wear | 1 | 125.21 |
| **IB007** | 0001 | Archaic | Lowe | Biface, Preform, Complete | -- | Chert | patinated; early stage | 1 | 167.05 |
| **IB008** | 0001 | Archaic | -- | Macroflake, Macroflake, Complete | -- | Chert | probable archaic; macroflake | 1 | 61.74 |
| **IB009** | 0001 | Archaic | -- | Uniface, Adze, Complete | -- | Chert | cortex; unifacially modified | 1 | 88.42 |
| **IB010** | 0001 | Archaic | Lowe | Biface, Point, Broken | Stemmed | Chert | missing stem and tip; broken from impact? | 1 | 44.28 |
| **IB011** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | thinly banded; missing notch in one lateral edge | 1 | 44.17 |
| **IB012** | 0001 | Archaic | Lowe | Biface, Point, Broken | Proximal-Medial Stemmed Retouched | Chert | impaact damage | 1 | 26.84 |
| **IB013** | 0001 | Archaic | Lowe | Biface, Point, Broken | Stemmed | Chert | finished; distal tip and one barb and stem corner missing | 1 | 33.35 |
| **IB015** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Complete | -- | Chert | potential paloeindian preform | 1 | 40.48 |
| **IB016** | 0001 | Archaic | Ya'axche' | Biface, Preform, Complete | Stemmed | Chert | complete biface preform; proportionally shorter stem as it is being finished | 1 | 73.68 |
| **IB017** | 0001 | Paleoindian | Unfluted Lanceolate | Biface, Preform, Complete | Unfluted Retouched | Chert | unfluted lanceolate; retouched along distal | 1 | 102.06 |
| **IB020** | 0001 | Archaic? | -- | Ground-Pecked, Ball, -- | -- | Metamorphic | ground and pecked around the circumference | 1 | 42.72 |
| **IB021** | 0001 | Archaic? | -- | Ground-Pecked, Pestle, -- | Conical Flat bottom | Metamorphic | pestle; light gray | 1 | 614.98 |
| **IB022** | 0001 | Archaic? | -- | Ground-Pecked, Pestle, -- | Conical Flat bottom | Metamorphic | pestle; gray brown | 1 | 874.26 |
| **IB023** | 0001 | Archaic? | -- | Ground-Pecked, Pestle, -- | Conical Flat bottom | Metamorphic | pestle; light gray brown | 1 | 1118.16 |
| **IB024** | 0001 | Archaic? | -- | Ground-Pecked, Large Cobble, -- | -- | Metamorphic | reddish; smooth, large cobble | 1 | 963.37 |
| **IB025** | 0001 | Archaic? | -- | Ground-Pecked, Slab, -- | -- | Metamorphic | long gray, flat ground slab | 1 | 649.1 |
| **IB026** | 0001 | Archaic? | -- | Ground-Pecked, Pestle, Broken | Conical | Metamorphic | broken pestle fragment; gray | 1 | 268.7 |
| **IB027** | 0001 | Archaic? | -- | Ground-Pecked, Handstone, -- | -- | Metamorphic | very polished, large brown red cobble | 1 | 785.33 |
| **IB028** | 0001 | Archaic? | -- | Ground-Pecked, Handstone, -- | -- | Metamorphic | fairly rough textured, pinkish stone | 1 | 445.01 |
| **IB014** | 0001 | Maya | -- | Biface, Point, -- | Stemmed | Chert | complete | 1 | -- |
| **IB018** | 0001 | Paleoindian | -- | Blade, Flake Tool, Complete | -- | Chert | use wear | 1 | 37.36 |
| **IB019** | 0001 | Archaic | Sawmill | Biface, Point, Complete | Stemmed Retouched | Chert | resharpened; patinated | 1 | 17.66 |
| **IK001** | 0001 | Archaic | Lowe | Biface, Point, Broken | -- | Chert | missing one barb | 1 | 181.50 |
| **IK002** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Complete | -- | Chert | heavily resharpened | 1 | 10.51 |
| **IK003** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Retouched | Chert | banded material | 1 | 19.97 |
| **IT001** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Medial-Distal Fluted | Chert | Preform, missing base, fluting failure; on a flake | 1 | 20.51 |
| **IT002** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | Proximal-Medial Fluted Waisted | Chert | Medial-proximal fragment, distal tip missing | 1 | 9.93 |
| **IT003** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Medial-Distal | Chert | Preform, missing base, fluting failure | 1 | 19.08 |
| **IT004** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Medial-Distal | Chert | Preform, missing base; overshot flaking present | 1 | 35.87 |
| **IT005** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal-Medial Fluted Waisted | Chert | Preform, final stage, fluting failure, 50% of piece present; wide | 1 | 28.28 |
| **IT006** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Medial-Distal | Chert | Broken along base; fluted on face | 1 | 16.14 |

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **IT007** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | Proximal Fluted Waisted | Chert | basal fragment; waisted fluted; finished | 1 | 3.26 |
| **IT008** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal-Medial Fluted | Chert | possible overshot failure; fluted on one face | 1 | 24.93 |
| **IT009** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Waisted | Chert | waisted fluted | 1 | 17.54 |
| **IT010** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | Proximal Fluted Waisted | Chert | basal fragment; waisted fluted; finished; incomp measurements | 1 | 4.43 |
| **IT011** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed | Chert | Heavily resharpened. Nick on one barb. | 1 | 37.92 |
| **IT012** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed Retouched | Chert | Heavily resharpened. Nick on tip, blade, & stem. | 1 | 36.86 |
| **IT013** | 0001 | Archaic | Lowe | Biface, Point, Broken | Stemmed | Chert | missing stem and tip; broken from impact? | 1 | 34.68 |
| **IT014** | 0001 | Archaic | Lowe | Biface, Point, Broken | Stemmed | Chert | "Narrow-barbed" type. Missing one barb; notch punch failure. Shovel nicks on tip and stem; manufacturing failure | 1 | 67.69 |
| **IT015** | 0001 | Paleoindian | Fishtail | Biface, Point, Broken | Distal | Chert | Distal tip; possible fishtail; incomplete measurements | 1 | 4.28 |
| **IT016** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | Complete, heavily patinated; missing one barb | 1 | 33.35 |
| **IT017** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | Proximal Fluted Waisted | Chert | basal fragment; waisted fluted; finished | 1 | 2.95 |
| **IT018** | 0001 | Paleoindian | -- | Biface, Point, Broken | Distal | Chert | indeterminant distal tip; heat damaged; incomp measurements | 1 | 6.46 |
| **IT019** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Distal | Chert | manufacturing failure; on a flake | 1 | 13.3 |
| **IT020** | 0001 | Archaic | -- | Uniface, Macroflake, Complete | -- | Chert | heavily patinated; with cortex | 1 | 212.18 |
| **IT021** | 0001 | Archaic | -- | Macroflake, Macroflake, Complete | -- | Chert | probable archaic; macroflake | 1 | 136.89 |
| **IT022** | 0001 | Archaic | -- | Uniface, Macroblade, Complete | -- | Chert | probable archaic; macroblade | 1 | 121.8 |
| **IT023** | 0001 | Paleoindian | -- | Debitage, Macroflake, Broken | Proximal-Medial | Chert | patinated macroflake; broken | 1 | 144.9 |
| **IT024** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | probable paleoindian scraper?; banded | 1 | 62.85 |
| **IT025** | 0001 | Paleoindian | -- | Uniface, Scraper, Broken | Proximal-Medial | Chert | probable scraper; missing distal | 1 | 20.42 |
| **IT026** | 0001 | Paleoindian | -- | Uniface, Scraper, Broken | Proximal | Chert | unifacially modified flake | 1 | 21.35 |
| **IT027** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | unifcially modified flake | 1 | 23.46 |
| **IT028** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | end scraper | 1 | 30.18 |
| **IT029** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | uniface scraper on flake | 1 | 12.65 |
| **IT030** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | end scraper | 1 | 45.67 |
| **IT031** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | end scraper | 1 | 45.97 |
| **IT032** | 0001 | Archaic | Sawmill | Biface, Point, Broken | Stemmed | Chert | stem broken | 1 | 22.99 |
| **IT033** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | broken tip, possible impact fracture on tip and ear of stem; complete | 1 | 29.86 |
| **IT034** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | unifcially retouched scraper on a flake | 1 | 56.54 |
| **IT035** | 0001 | Paleoindian | Fishtail | Biface, Preform, Broken | Proximal-Medial Stemmed Fluted | Chert | unground stem; broken, missing distal tip and shoulder; manufacturing failure; reconstr width | 1 | 6.85 |
| **IT036** | 0001 | Paleoindian? | -- | Debitage, Flake, -- | -- | Chert | with cortex; paleoindian? | 1 | 73.41 |
| **IT037** | 0001 | Paleoindian? | Clovis-y | Biface, Preform, Broken | Proximal-Medial | Chert | broken preform; incomplete length | 1 | 62.21 |

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **IT038** | 0001 | Paleoindian? | -- | Macroflake, Macroflake, Complete | -- | Chert | with cortex | 1 | 50.14 |
| **IT039** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Proximal-Medial | Chert | broken preform | 1 | 19.33 |
| **IT040** | 0001 | Archaic | Lowe | Biface, Preform, Broken | Stemmed | Chert | mid stage; manufacture failure | 1 | 63.83 |
| **IT041** | 0001 | Archaic | -- | Ground-Pecked, Ball, Complete | -- | Metamorphic | 5.5cm x 6cm; flatter on one side | 1 | 259.85 |
| **JC001** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | complete; misssing one ear | 1 | 32.75 |
| **JC002** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Broken | Proximal-Medial Stemmed | Chert | missing distal end; narrow stemmed point | 1 | 15.79 |
| **JC003** | 0001 | Archaic | Lowe | Biface, Point, Broken | Medial Stemmed | Chert | broken shoulder; resharpened stem | 1 | 30.22 |
| **JC004** | 0001 | Archaic | Lowe | Biface, Preform, Broken | Proximal-Medial Stemmed | Chert | unfinished; broken | 1 | 50.43 |
| **JC005** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed | Chert | missing distal tip | 1 | 28.66 |
| **JC006** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | complete; light gray | 1 | 43.05 |
| **JC007** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed Retouched | Chert | heavily resharpened; left lateral bevel | 1 | 23.23 |
| **JT001** | 0001 | Paleoindian | -- | Uniface, Flake Tool, Broken | Proximal-Medial | Chert | Heavily ground platform; unifacially modfied | 1 | 16.87 |
| **JT002** | 0001 | Paleoindian | -- | Uniface, Graver, Broken | 0.9 | Chert | Graver tip, scraper edge; DID NOT EXPORT, was missed in final inventory | 1 | 8.28 |
| **JT003** | 0001 | Paleoindian | -- | Uniface, Scraper, Broken | Proximal | Chert | unifacially modified thinning flake | 1 | 13.1 |
| **JT004** | 0001 | Paleoindian | Fishtail | Biface, Preform, Broken | Distal | Chert | Distal fragment; possible fishtail | 1 | 37.3 |
| **JT005** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Medial-Distal | Chert | Distal fragment | 1 | 10.33 |
| **JT006** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Medial-Distal | Chert | Distal fragment, started as flake | 1 | 15.2 |
| **JT007** | 0001 | Paleoindian | Fishtail | Biface, Preform, Broken | Medial-Distal | Chert | possible fishtail; broken | 1 | 16.48 |
| **JT008** | 0001 | Paleoindian | -- | Biface, --, Broken | Distal | Chert | Distal fragment | 1 | 20.81 |
| **JT009** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Medial | Chert | Medial fragment | 1 | 30.88 |
| **JT010** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Medial | Chert | Medial fragment | 1 | 36.96 |
| **JT011** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Proximal | Chert | proximal fragment | 1 | 24.84 |
| **JT012** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Proximal | Chert | proximal fragment | 1 | 23.92 |
| **JT014** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Proximal-Medial Fluted | Chert | medial-proximal; distal end missing; clovis-y | 1 | 17.77 |
| **JT015** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Proximal Fluted | Chert | proximal; manufacturing failure; clovis-y; DID NOT EXPORT, was missed in final inventory | 1 | 21.18 |
| **JT016** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | Medial-Distal Fluted Waisted | Chert | 85% complete point; missing base | 1 | 31.49 |
| **JT017** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Medial-Distal Fluted | Chert | Fluting failure, diving channel flake; distal portion with flute attached; cortex on one laterl margin | 1 | 23.08 |
| **JT018** | 0001 | Archaic | Lowe | Biface, Preform, -- | Distal | Chert | Large distal preform fragment | 1 | 98.48 |
| **JT019** | 0001 | Archaic | Lowe | Biface, Point, Broken | Proximal-Medial | Chert | heat altered; broken distal | 1 | 23.94 |
| **JT020** | 0001 | Archaic | Lowe | Biface, Preform, Broken | Proximal Stemmed | Chert | Midstage peform, proximal frament | 1 | 23.43 |
| **JT021** | 0001 | Archaic | Lowe | Biface, Point, Broken | Proximal Stemmed | Chert | Proximal fagment, complete stem | 1 | 9.75 |
| **JT022** | 0001 | Archaic | Lowe | Biface, Preform, Broken | Proximal Stemmed | Chert | Proximal 1/2, 98% finished preform | 1 | 31.29 |
| **JT023** | 0001 | Archaic | Lowe | Biface, Point, Broken | Medial-Distal Stemmed | Chert | Proximal 1/2, finished point | 1 | 27.77 |
| **JT024** | 0001 | Archaic | Lowe | Biface, Point, Broken | Distal | Chert | distal fragment; | 1 | 16.24 |

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **JT025** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Broken | Proximal Stemmed | Chert | Proximal fragment, narrow stemmed point; very end of the stem is broken | 1 | |
| **JT026** | 0001 | Archaic? | -- | Debitage, Flake, -- | -- | Obsidian | Obsidian flake | 1 | 9.14 |
| **JT027** | 0001 | Archaic? | -- | Debitage, Chunk, -- | -- | Obsidian | Obsidian chunk | 1 | 8.95 |
| **JT028** | 0001 | Archaic | -- | Uniface, Constricted Adze, Complete | -- | Chert | Constricted adze; tan chert | 1 | 61.32 |
| **JT029** | 0001 | Archaic | -- | Uniface, Constricted Adze, Complete | -- | Chert | Constricted adze; light gray-tan | 1 | 134.59 |
| **JT030** | 0001 | Archaic | -- | Uniface, Constricted Adze, Complete | -- | Chert | Constricted adze;tan-brown | 1 | 159.92 |
| **JT031** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Broken | Proximal-Medial Stemmed | Chert | Proximal fragment, narrow stemmed point | 1 | 22.63 |
| **JT032** | 0001 | Paleoindian | Unfluted Lanceolate | Biface, Preform, Broken | Proximal-Medial Unfluted Retouched | Chert | Medial-proximal fragment, thick unfluted lanceolate | 1 | 33.02 |
| **JT033** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal-Medial | Chert | Preform, final stage failure | 1 | 16.44 |
| **JT034** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal | Chert | Preform, final stage stem failure | 1 | 14.4 |
| **JT035** | 0001 | Paleoindian | Clovis-y | Biface, Point, Complete | Fluted | Chert | Possible reworked medial-distal fragment; made off a flake | 1 | 11.75 |
| **JT036** | 0001 | Archaic | Sawmill | Biface, Point, Broken | 90% Stemmed | Chert | "Mini" Sawmill type pt. Ssmissing. | 1 | 7.98 |
| **JT037** | 0001 | Paleoindian | Unfluted Lanceolate | Biface, Preform, Broken | Proximal-Medial Unfluted | Chert | Medial-proximal fragment, thick unfluted lanceolate | 1 | 54.19 |
| **JT038** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Broken | Medial-Distal Stemmed | Chert | broken stem | 1 | 21.99 |
| **JT039** | 0001 | Archaic | Lowe | Biface, Point, Broken | 90% Stemmed | Chert | Tip, barbs, and most of base missing. | 1 | 45.13 |
| **JT040** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Waisted | Chert | Nearly pristine; unifacial; made on a flake | 1 | 14.84 |
| **JT041** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Medial-Distal | Chert | Mid-blade snap; manufacturing/fluting failure; unifcially modified on a flake | 1 | 10.37 |
| **JT042** | 0001 | Archaic | Sawmill | Biface, Preform, Broken | Medial-Distal | Chert | perverse fracture; distal-medial | 1 | 37.06 |
| **JT043** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Broken | 0.9 Stemmed | Chert | stem and distal tip broken; possible impact damage | 1 | 16.83 |
| **JT044** | 0001 | Paleoindian | -- | Biface, Point, Broken | Distal | Chert | indeterminant distal tip; incomp measurements | 1 | 3.86 |
| **JT045** | 0001 | Paleoindian | -- | Debitage, Flake, Complete | Thinning | Chert | banded, thinning flake | 1 | 17.86 |
| **JT046** | 0001 | Paleoindian | -- | Debitage, Flake, Complete | Thinning | Chert | patinated, biface thinning flake; probable indirect percussion | 1 | 52.4 |
| **JT047** | 0001 | Paleoindian | -- | Macroflake, Flake Tool, Broken | 0.9 | Chert | unifacially modified flake | 1 | 58.53 |
| **JT048** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | End scraper; DID NOT EXPORT, was missed in final inventory | 1 | 27.79 |
| **JT049** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Broken | Medial-Distal | Chert | setup for overshot flaking | 1 | 19.89 |
| **JT050** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal | Chert | manufacturing failure; fluted one face | 1 | 13.47 |
| **JT051** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal-Medial | Chert | manufacturing failure; fluted one face | 1 | 23.47 |
| **JT052** | 0001 | Paleoindian | Fishtail | Biface, Point, Broken | Medial Stemmed Fluted | Chert | missing distal tip and stem; fishtail | 1 | 20.19 |
| **JT053** | 0001 | Paleoindian | Pine Ridge | Biface, Point, Broken | 0.9 Stemmed | Chert | broken stem; sharp shoulder; resharpened | 1 | 18.78 |
| **JT054** | 0001 | Paleoindian | -- | Debitage, Flake, Complete | 0.9 Thinning | Chert | paloindian materia; biface thinning | 1 | 20.41 |
| **JT055** | 0001 | Archaic | Lowe | Biface, Point, Complete | Stemmed | Chert | complete; interesting patinated material | 1 | 37.14 |
| **JT056** | 0001 | Archaic | Lowe | Biface , Point, Broken | 90% Stemmed | Chert | broken and missing stem | 1 | 39.9 |
| **JT057** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Complete | Fluted | Chert | failed flute | 1 | 24.84 |
| **JT058** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | Fluted Waisted | Chert | waisted fluted; complete; made on a flake | 1 | 24.74 |
| **JT059** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Broken | 90% Fluted Waisted | Chert | waisted fluted; complete; one ear broken | 1 | 30.88 |

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **JT060** | 0001 | Paleoindian | Pine Ridge | Biface , Point, Broken | Stemmed | Chert | broken stem and distal tip | 1 | 20.99 |
| **JT061** | 0001 | Archaic | -- | Uniface, Constricted Adze, Complete | -- | Chert | lightly banded | 1 | 287.5 |
| **JT062** | 0001 | Archaic | Lowe | Biface, Point, Broken | Stemmed | Chert | broken; missing one lateral edge | 1 | 34.21 |
| **JT063** | 0001 | Archaic | Lowe | Biface, Point, Broken | -- | Chert | one barb and distal tip present | 1 | 6.8 |
| **JT064** | 0001 | Archaic | -- | Ground-Pecked, Ball, Complete | -- | Metamorphic | non-chert; flat; polished | 1 | 274.86 |
| **JT065** | 0001 | Archaic | -- | Ground-Pecked, Ball, Complete | -- | Metamorphic | non-chert; flat; polished | 1 | 157.2 |
| **JT066** | 0001 | Archaic | -- | Ground-Pecked, Ball, Complete | -- | Metamorphic | non-chert; very round | 1 | 228.04 |
| **JT067** | 0001 | Archaic | -- | Ground-Pecked, Ball, Complete | -- | Metamorphic | non-chert; ball | 1 | 248.29 |
| **JT068** | 0001 | Archaic | -- | Ground-Pecked, Ball, Complete | -- | Metamorphic | non-chert; ball | 1 | 269.06 |
| **JT069** | 0001 | Paleoindian | Waisted Fluted | Biface, Point, Complete | -- | Chert | orange-brown | 1 | 24.3 |
| **JT070** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | end scraper; very thin | 1 | 34.8 |
| **JT071** | 0001 | Archaic | Sawmill | Biface, Point, Complete | Stemmed | Chert | complete; patinated differently on each side | 1 | need weights |
| **JT072** | 0001 | Archaic | Sawmill | Biface, Preform, Broken | Distal | Chert | only distal present; preform | 1 | need weights |
| **JT073** | 0001 | Archaic | Sawmill | Biface, Preform, Broken | Distal | Chert | only distal present; preform | 1 | need weights |
| **JT074** | 0001 | Paleoindian | Indeterminant | Biface, Preform, Broken | Distal | Chert | indeterminant fluted preform | 1 | need weights |
| **JT075** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Medial-Distal | Chert | distal medial preform; overshot flake | 1 | need weights |
| **JT076** | 0001 | Paleoindian | Clovis-y | Biface, Preform, Broken | Medial | Chert | Medial fragment | 1 | need weights |
| **JT077** | 0001 | Paleoindian | Indeterminant | Biface, Preform, Broken | Proximal | Chert | basal preform fragment | 1 | need weights |
| **JT078** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | blade-like, not true blade; edge use/edge scraper | 1 | need weights |
| **JT079** | 0001 | Paleoindian | -- | Debitage, Macroflake, Complete | Thinning | Chert | biface thinning flake with edge use | 1 | need weights |
| **JT080** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | end scraper | 1 | need weights |
| **JT081** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | end scraper | 1 | need weights |
| **JT082** | 0001 | Archaic | -- | Groundstone, Stone Bowl, Complete | -- | Metamorphic | small stone; refit | 1 | 289.21 |
| **JT083** | 0001 | Archaic | -- | Groundstone, Stone Bowl, Broken | -- | Metamorphic | broken, long flat stone bowl | 1 | 1110.05 |
| **JT084** | 0001 | Archaic | -- | Macroblade, Macroblade, Complete | -- | Chert | pointed | 1 | 209.08 |
| **LC001** | 0001 | Archaic | Lowe | Biface, Point, Broken | Proximal-Medial Stemmed | Chert | medial-proximal; one shoulder missing and distal end | 1 | 20.2 |
| **LC002** | 0001 | Paleoindian | -- | Blade, --, Broken | Proximal | Chert | proxmial end | 1 | 6.24 |
| **LC003** | 0001 | Archaic? | -- | Ground-Pecked, Pebble, -- | -- | Metamorphic | brown red ground-pecked stone | 1 | 22.15 |
| **LC004** | 0001 | Archaic? | -- | Blade, Blade, -- | -- | Chert | unifcially flaked | 1 | 32.77 |
| **LC005** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | -- | Chert | uniface scraper | 1 | 15.21 |

| Lot # | Specimen Number (SN) | Period | Type | Class, Category, Condition | Characteristics | Artifact Material | Description | Artifact Count | Artifact Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| **LC006** | 0001 | Paleoindian | -- | Uniface, Scraper, Complete | Retouched | Chert | consistently flaked around lateral edges | 1 | 28.7 |
| **LC007** | 0001 | Paleoindian | Waisted Fluted | Biface, Preform, Broken | Proximal-Medial Fluted | Chert | broken, missing distal end | 1 | 15.16 |
| **LC008** | 0001 | Archaic | Lowe | Biface, Point, Complete | -- | Chert | left edge bevel | 1 | 38.3 |
| **LC009** | 0001 | Archaic | Lowe | Biface, Point, Complete | -- | Chert | left edge bevel | 1 | 48.74 |
| **LC010** | 0001 | Paleoindian | -- | Macroflake, Flake Tool, Complete | -- | Chert | lateral edge wear on one side | 1 | 44.3 |
| **LC011** | 0001 | Paleoindian | Fishtail | Biface, Preform, Broken | Medial-Distal | Chert | likely fishtail preform; incomplete measurements | 1 | 20.23 |
| **TR001** | 0001 | Paleoindian | Indeterminant W/C | Biface, Preform, Complete | -- | Chert | setup for overshot flaking | 1 | 22.78 |
| **TZ001** | 0001 | Archaic | Lowe | Biface, Point, Complete | -- | Chert | missing distal tip | 1 | 43.03 |
| **TZ002** | 0001 | Archaic | -- | Macroblade, Macroblade, Complete | -- | Chert | with ridge; unifacially modified | 1 | 103.05 |
| **TZ003** | 0001 | Archaic | -- | Uniface, Macroblade, Complete | -- | Chert | heavily patinated; glued back together | 1 | 165.48 |
| **TZ004** | 0001 | Archaic | -- | Macroblade, Macroblade, Complete | -- | Chert | light tan; with ridge; unifacially modified | 1 | 398.28 |