ARCHAEOLOGICAL INVESTIGATIONS OF THE LOWER DOVER PERIPHERY, CAYO DISTRICT, BELIZE, CENTRAL AMERICA

by

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LIST OF ABBREVIATIONS

Abbreviation **Description**

BVAR – Belize Valley Archaeology Reconnaissance

BVAP – Belize Valley Archaeology Project

CDC – Colonial Development Corporation

CRM – Cultural Resource Management

E.U. – Excavation Unit

GIS – Geographic Information Systems

IOA- Institute of Archaeology

LiDAR- Light Detection and Ranging

LWD – Lower Dover

NICH – National Institute of Culture and History

STR - Structure

ABSTRACT

Gordon Willey pioneered settlement archaeology in the Virú Valley of Peru. While working with the Peabody in the 1950's he most notably applied this methodology at the Maya site of Barton Ramie. Barton Ramie was uncharacteristically devoid of an administrative center, making the site appear to be an autonomous residential community and thus a suitable subject for his research. For many years, Willey and subsequent researchers excluded another site that lay directly south of the Belize River, Lower Dover. Research of the Lower Dover settlement took place in the 2013 and 2014 archaeology field seasons. The investigations into the settlement focused on a 2 kilometer radius around the Lower Dover administrative center. This study seeks to elucidate weather Lower Dover served as the administrative center of Barton Ramie. However at the present the chronology of Lower Dover is unknown. There is currently no evidence of early construction in the site core.

I. INTRODUCTION

In 1953 Dr. Gordon Willey assembled a team of archaeologists from Harvard's Peabody Museum to begin investigations in the Belize River Valley (Willey *et al*. 1965). Challenging the predominant archaeological methodology of the era, Willey focused his efforts on the settlement areas rather than urban centers, a technique he developed in the Virú Valley of Peru (Willey *et al.* 1953).

When he and his team arrived in British Honduras (present day Belize), they recorded multiple archaeological sites along the Belize River valley. However the site that would be the focus of most of their attention was Barton Ramie. Located to the north of the Belize River Barton Ramie at the time was an Estate Plantation operated by the Colonial Development Corporation (CDC).

The area gets its name from Barton Creek, a permanent stream that cascades via the Mountain Pine Ridge and finally empties into the Belize River. In Willey's words "…the Barton Ramie Estate was admirably suited for our archaeological work, since along with the adjacent Spanish Lookout fields across the river to the west, it comprised the largest completely cleared stretch of bottom land along the entire upper course of the Belize River valley"(Willey *et. al,* 1965:30). He also noted that, "the greater part of the clearing was liberally sprinkled with ruin mounds" (Willey *et. al,* 1965:30). Moreover, due to the site's lack of a typical administrative center it was seemingly a largely autonomous residential area, which is why Willey chose the site. Lower Dover may have been the administrative center of Barton Ramie in the Late Classic Period. However the relationship between Lower Dover and Barton Ramie remains unknown.

It was around this time that a Belizean named Donald Hill came into Willey's employ. I had the opportunity to meet Mr. Hill in the Cayo District of Belize in the summer of 2014. I took the opportunity to ask Mr. Hill what it was like working at Barton Ramie with Willey. He explained that at that time he had just left the CDC and met John Glass, an archaeologist on the Peabody team, who informed him of the work that was to be done on the Barton Ramie Estate. Mr. Hill became the foreman for the excavators working at the Barton Ramie site. Additionally, he performed the maintenance on Willey's Jeep and drove the Harvard archaeologists to and from the workplace (D. Hill, personal communication, August 4, 2014).

Mr. Hill explained that he accompanied Glass on the initial survey of the area. It was then that I asked Mr. Hill if he knew of the work being done across the Belize River from Barton Ramie at a site called Lower Dover. He explained that he had in fact heard of recent work being done in the area. I asked Mr. Hill if Willey knew of the existence of Lower Dover. Mr. Hill was adamant that Willey was aware of the site.

Abundant archaeological research has been undertaken in and around Barton Ramie since Willey first investigated the site in the 1950's. As the public understands and appreciates cultural heritage more, previously undocumented archaeological sites are reported. Two of these sites were recorded since Willey's Barton Ramie investigations. Understandably, this has led to changing hypotheses and interpretations. In this thesis I seek to discover if Lower Dover and Barton Ramie are actually the same settlement, and determine the likelihood that Lower Dover served as the administrative center of Barton Ramie. Moreover, I seek to establish a chronology of occupation in the settlement area. What follows are the results of the 2013-2014 research in the Lower Dover Periphery.

It should be noted that the excavations for this thesis were conducted in only one area. While this area has evidence of Preclassic occupation, it should not be taken to implicitly suggest that the entirety of the settlement area dates to this time period.

Historical Background

It is imperative that I introduce some details of the neighboring sites surrounding Lower Dover. Surrounding sites include Floral Park, Baking Pot, Blackman Eddy, and Barton Ramie (Figure 1). Of these sites the latter two are those which hold particular relevance to this research. Because of their proximity to Lower Dover and their research history, these two sites warrant further elaboration, Blackman Eddy to the east, and of course Barton Ramie to the north. All of these sites have been excavated and researched extensively, in fact, Baking Pot research was spurred in the 1920's after some of the site's materials were used to aid in building the Belize Western Highway (Ricketson 1931), and the site has experienced much research since then (see Ricketson 1931; Willey *et al.* 1965; Bullard and Bullard 1965; Awe and Helmke 2005; Hoggarth 2012).

Comparatively, at the time of this writing the work being conducted at Lower Dover is still in its infancy. Research officially began at Lower Dover in 1996 when the University of Nebraska at Omaha conducted a geology study when the site went under the name 'Tres Rios' (Castelhano *et al*. 1996). Then in 2010 the B.V.A.R. Project, a field school then operating under the auspices of the Institute of Archaeology (I.O.A.) and National Institute of Culture and Heritage (N.I.C.H.) in Belmopan Belize, broke ground that summer.

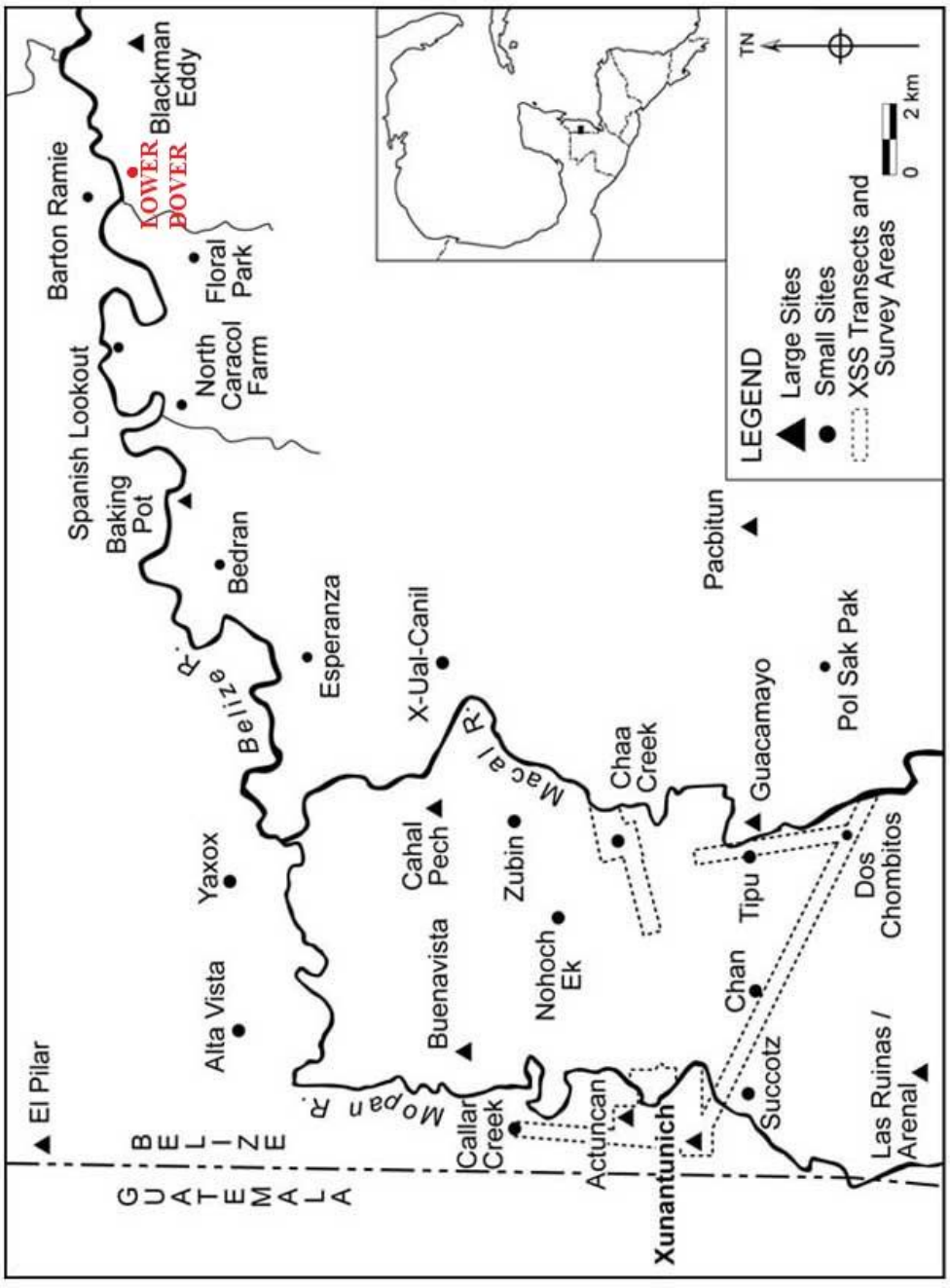

Figure 1. Map of the Upper Belize River Valley (after Yaeger 2005: Fig. 2).

The current owners, the Reynolds', 100 acre property encompasses the Lower Dover site. They purchased the property in the late 1980's from an American Hotelier and businessman who explained to them that the entire eastern half of the archaeological site was bulldozed and one crop of corn was planted in the late 1960's, before it was allowed to be reclaimed by the jungle. Some of this bulldozed expanse was utilized to build the current day resort that occupies the site currently (W. Reynolds, personal communication, November 6, 2014). In 1995 the owners, by this point seasoned expatriates and veterans of archaeological sites in Belize, reached out to the University of Nebraska at Omaha.

The University soon responded that the department of Geography and Geology would be interested in testing the soil phosphate levels of the site and perhaps a student could use the research in fulfillment of a Master's thesis. The project was multidisciplinary as it included an archaeological element. The archaeological element included the mapping of the site which was supervised by James F. Garber an archaeologist who was at that time working at the nearby Blackman Eddy site (Castelhano *et al.* 1996).

The geologists dubbed the site *'Tres Rios'* or "Three Rivers", acknowledging the confluence of the Belize River, Upper, and Lower Barton Creeks. Philip Reeder the project supervisor, informed me that fifty-five soil samples were indeed collected however they were never analyzed (P. Reeder, personal communication, November 5, 2014). Castelhano turned in a field report, unfortunately no subsequent archaeological reports regarding the site were produced until fourteen years later.

Several years later it was decided by the Institute of Archaeology that the name '*Tres Rios*' would be confused with the '*Tres Rios*' region to the north. The name Lower Dover was decided upon after a land-use study was conducted in Unitedville by the University of Wisconsin at Milwaukee (W. Reynolds, personal communication, November 6, 2014). The historical records indicated that the village of Unitedville was named 'Dover' home to a logging camp in the countries colonial past.

Probably named after the town of Dover in the county of Kent in South East England. Dover, England is home to a well-known and historically important port, as well as the famous limestone 'Dover Cliffs' which are only slightly reminiscent of the limestone outcroppings surrounding Unitedville. As the property is located low in the River Valley, the name '*Lower* Dover' stuck (W. Reynolds, personal communication November 6, 2014). While Gordon Willey certainly initiated the study of many of the Belize River Valley archaeological sites, another site that would go undiscovered by he and his team was the nearby site of Blackman Eddy.

Blackman Eddy

Blackman Eddy (Figure 2) was first researched in 1990 by the Belize Valley Archaeology Project (B.V.A.P) of Southwest Texas State University (now Texas State University). B.V.A.P. was originally initiated to investigate the sociopolitical role of Blackman Eddy in relation to the political centers in the west (Garber et al 2004: 26). However, the task of the project was unexpectedly changed in 1994.

Illegal bulldozing in the 1980's demolished half of one of the major structures (Plaza B) in the site thus exposing a profile spanning nearly 2,000 years of history. The severity of the damage left nothing to repair. Fearful of the consequences the harsh environment would have on the exposed archaeological data the Belize Department of Archaeology decided it would be best to focus the projects efforts on complete and extensive research on Structure B1, the severely damaged pyramidal construction (Garber *et al.* 2004: 26, 48).

The site spans an area of 1.9 hectares and is smaller than its western neighbors identified by Willey as being major centers. However, Garber noted that 'the sites architectural features allow the site to meet the criteria for a major center' (Garber *et al.* 2004: 49).

The criterion for this classification are delineated as containing nine characteristics. Helmke and Awe explain that;

"…despite the great variability in quantity and quality, all these 'major centers' of the greater Belize Valley area exhibit to varying degrees;

1) Nucleated monumental epicenters, 2) pyramidal temple structures, 3) eastern triadic temples (such as E-Group-like configurations), 4) royal palatial groups,

5) ball courts, 6) monuments such as stelae and altars (some of which were carved), 7) intrasite processional sacbeob (causeways), 8) sacbe termini groups, and 9) in some cases royal tombs" (Helmke and Awe, 2012).

The archaeological investigations of multiple structures within the Blackman Eddy site core show a consistent timeline of occupation that spans from the Terminal Early Formative (ca. 1100 B.C.) with an abundance of construction in the Late Classic (600-850 A.D.) contained to Plaza A until 'it is apparent that Blackman Eddy was eclipsed by larger centers to the west' (Garber *et al.* 2004:68) and archaeological evidence of occupation at the site suggest that the site was abandoned at the close of the Late Classic.

The chronology of occupation at Blackman Eddy begins in the early Middle Formative (1100 B.C) as evidenced by the presence of Kanocha phase pottery (same as the Cunil Phase at Cahal Pech). Continuous occupation at the site is apparent up through the Late Classic Period (600-900 A.D) (Garber *et a*l. 2004).

The data recovered from Blackman Eddy has provided the archaeological record with tantalizing insights to Maya political structure, in that, after years of research (1990-2001) the B.V.A.P investigations evidence suggested Blackman Eddy likely served as the missing administrative center for Barton Ramie (Garber *et al*. 2004: 67), as the two sites have the same construction history.

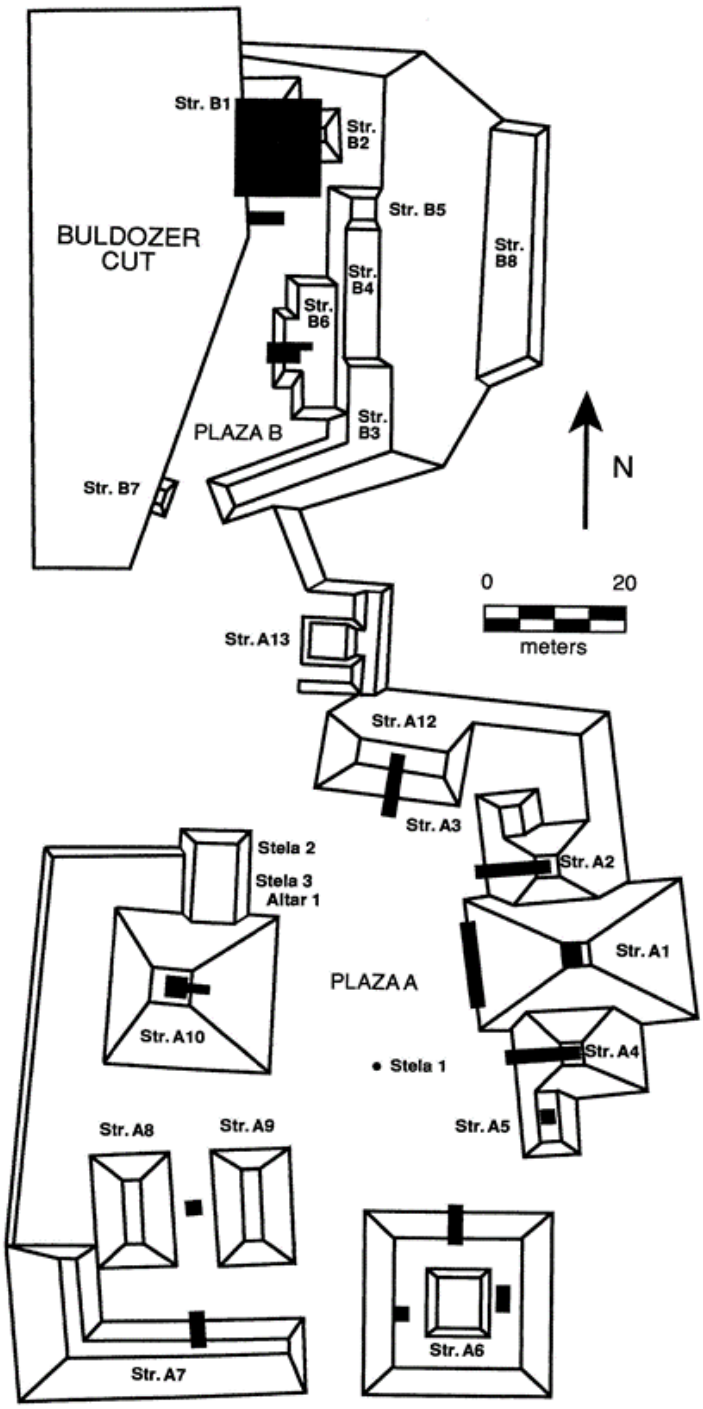

Figure 2: Map of Blackman Eddy Site Core (tested areas in black, from Garber *et al*. 2004:Fig. 4.1).

Barton Ramie

Barton Ramie (Figure 3) is situated on the northern banks of the Belize River, approximately 25km to the east of San Ignacio town and directly across the river from Lower Dover. The sites chronology is based on a detailed ceramic analysis (Gifford 1976). Barton Ramie begins with the Jenny Creek phase dating to the Middle Formative (1000BC-400BC) Period and continues through to the New Town phase in the Late Classic Period (AD 300-800) (Gifford *et al.* 1976). The survey boundaries of the Peabody investigations in 1950's were delineated arbitrarily based on 2sq. km of land that had been cleared by the CDC (Willey *et al*. 1965: 30). Willey notes that the terrain of Barton Ramie consists of a "deep alluvial clay" (Willey *et al*. 1965:30).

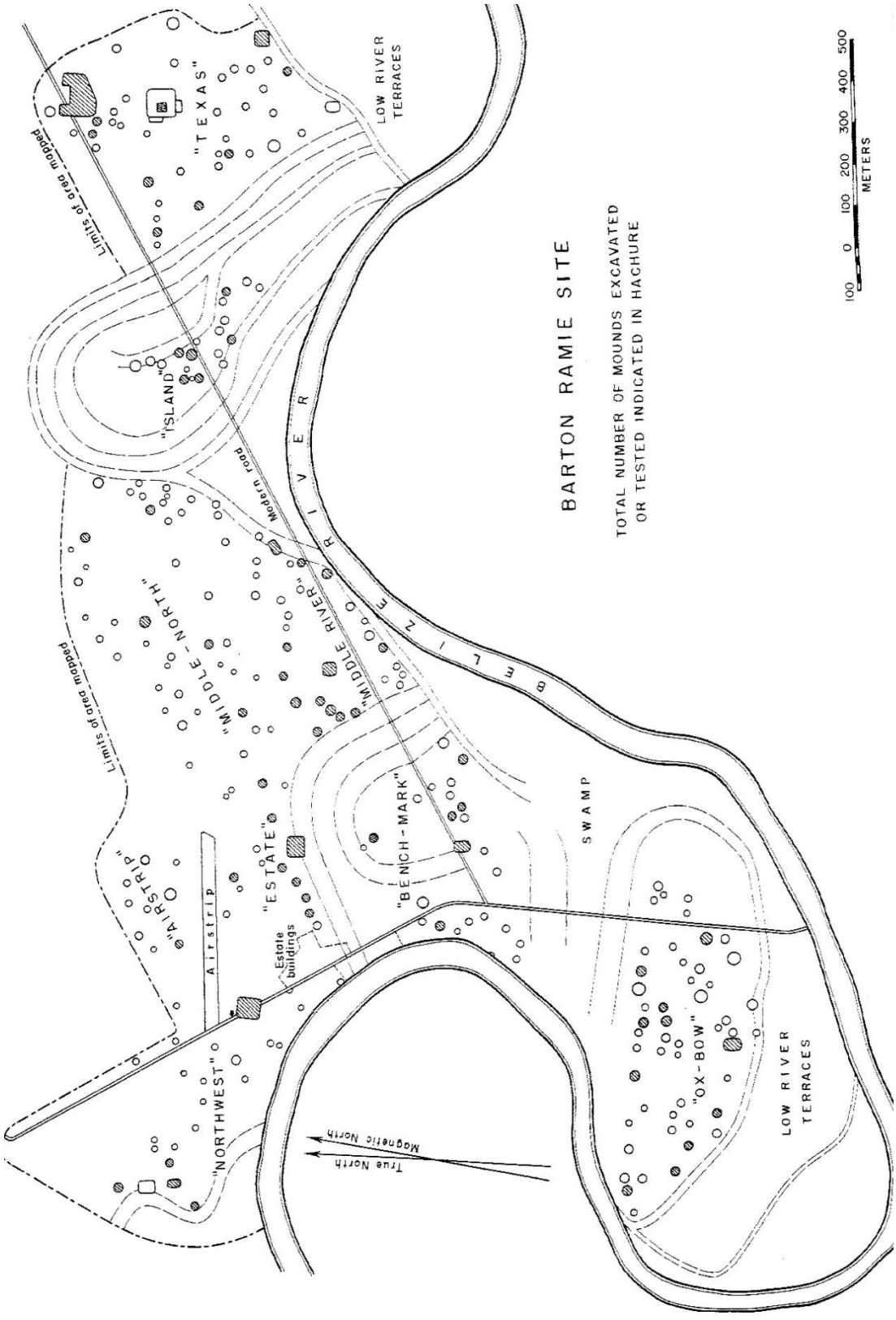

Figure 3. Map of the Barton Ramie Site Core (from Willey et al. 1965:Fig. 164).

The Peabody survey of Barton Ramie recorded 262 house mounds consisting of no "formal arrangement" (Willey *et al*. 1965:31). There are several river terraces on which the house mounds are situated atop the highest two. Willey noted that larger mounds were typically clustered more densely in areas near terrace edges and imparts that this was likely due to better ground drainage conditions when the river floods (Willey *et al* 1965:31).

Willey classified these mounds on the basis of their surface appearance into three general categories: "1) ordinary house mounds 2) 'plazuela' mounds; and 3) temple mounds" (Willey *et al*. 1965:34). Willey offers a brief description of these categories in stating that "the first category includes the majority of the house mounds. They are dome-shaped tumuli with oval or circular ground plans, measuring between 15 and 35 meters in diameter and .30 to 3.50 meters in height" (Willey *et al*. 1965:34).

The 'plazuela' mounds consist of three to four structures of varying sizes surrounding a rectangular court (Willey *et al*. 1965:34). For his third category Willey asserts that "only one mound, BR-180, can be considered a temple mound" according to the study's criterion. BR-180 is described as a "steep sided, rock filled, pyramid 12 meters high" which Willey postulates "presumably supported a small temple" (Willey *et al*.1965:31). BR-180 had several surrounding structures, the largest of these is BR-168. However, they were deemed unclassifiable according to their three category classificatory system. Willey and his team ascertained that because of their size BR-168 in conjunction with BR-180 may have served as a minor ceremonial center. (Willey *et al* 1965:34).

Willey mentions that the survey could not identify any breaks in settlement density allowing them to verify with any degree of accuracy specific community or sub-community groupings within Barton Ramie (Willey *et al*. 1965:34). Although a subsequent dissertation titled "Changing Perspectives on Community Identity and Function: A Remote Sensing and Artifactual Re-Analysis of Barton Ramie, Belize" from the University of Colorado was completed in 2009 and was directed toward that end (Weller 2009).

The Peabody survey leaves an open interpretation that BR-180 and surrounding structures (Figure 4), including BR-168 may have functioned in concert as a small center. However, Willey noted that "other ceremonial centers of comparable size were located across the river at Floral Park and Spanish Lookout" and added that, "many Barton Ramie mounds are as close, or closer to those sites as they are to BR-180" (Willey *et al*. 1965:34).

By Willey's estimates the Barton Ramie settlement zone accommodated a population of 2000 people (Willey et al. 1965: 576). However, as Weller's subsequent analysis observes "Willey assumed a high number of occupants per mound, that each mound served a residential purpose, and that the mounds were contemporary" (Weller 2009:17).

Finally, Weller asserts that "excavations revealed that the number of mounds cannot be equated with number of structures. There are many double mounds present at Barton Ramie that likely conceal at least two structures across a low patio" (Weller 2009: 17). It should be noted that there are several ways to assess the population of ancient

Maya settlement and population estimates can vary dramatically. However, in these two studies Weller presumes Willey's estimate is high.

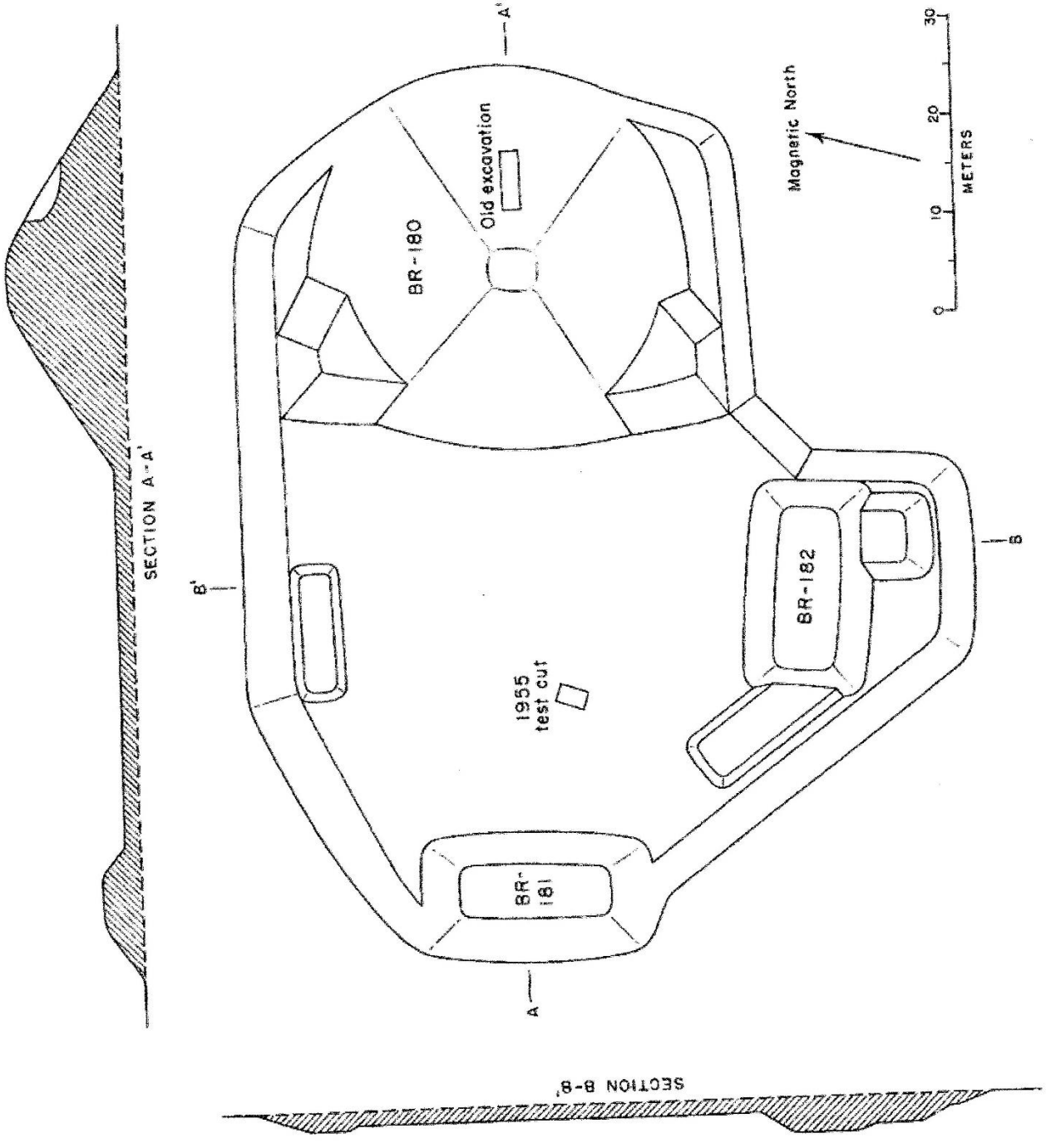

Figure 4: Map of BR-180-182 mound complex at Barton Ramie (from Willey *et al.* 1965:Fig.143).

Lower Dover

Approximately eleven kilometers east of San Ignacio, Lower Dover (Figure 5) is situated on the southern bank of the Belize River, which defined the northern boundary of this settlement survey. Directly across the Belize River lies Barton Ramie, it should be noted that the Belize River was also used by Willey- serving as Barton Ramie's southern boundary. Lower Dover is flanked by Blackman Eddy three kilometers to the east and Baking Pot approximately six kilometers to the west. Lower Dover is approximately 3 km north of Floral Park.

The ceremonial center covers an area of approximately 9.1 hectares, and contains thirteen plazas, an E-group like configuration, ball courts, nucleated monumental epicenter, and pyramidal temple structures. Aside from the collection of fifty soil samples taken in 1995 (Castelhano *et al.* 1996), the site remained neglected until archaeological investigations were initiated by the BVAR project and gained full momentum in 2010.

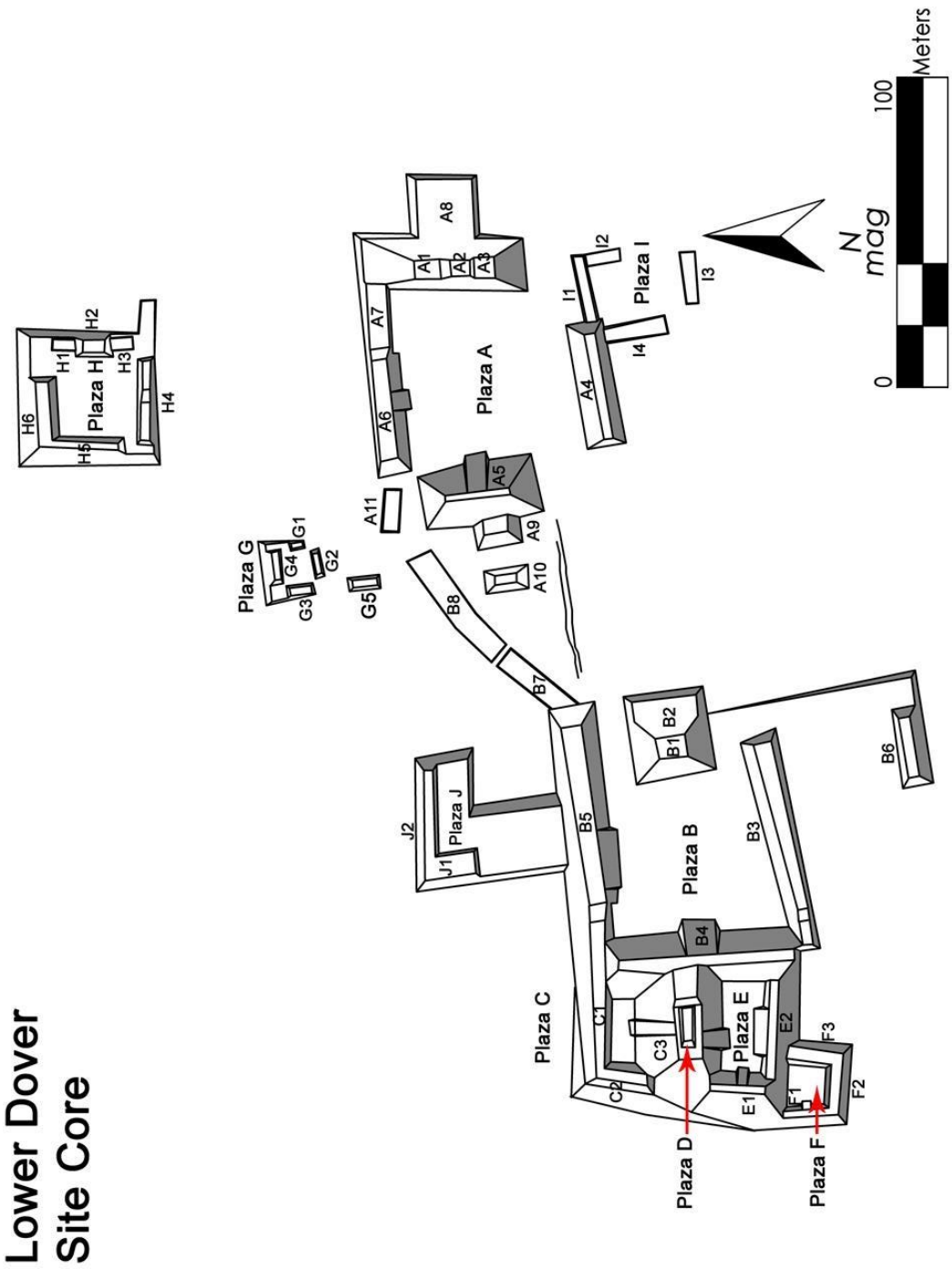

Figure 5. Map of the Lower Dover (Barton Ramie South) Site Core (from Guerra *et al.* 2011: Fig.1).

It should be noted that the 2010 site report mentions that preliminary reconnaissance in the settlement was initiated and mapping of the site core was conducted sometime in 2009 using a Topcon GTS 230W electronic total station (Guerra *et al*. 2011:5). However, the survey was not immediately followed up and no sampling or data collection was conducted at that time. In fact, the report states that only two days were allotted for the survey. The purpose of the work done in this early stage was largely undertaken to determine feasibility and improve the documentation and identification of structures within the site core, as well as, establishing two permanent datum in Plaza B (Guerra *et al* 2011:3).

The 2010 field season focused on the E-group configuration and the ball court (Wilkinson and Hude 2011). An excavation unit was established on the summit of structure A1-2 located in Plaza A. Structure A1-2 stands four meters tall and is the center structure in an E-group like configuration of structures. The purpose of this excavation was to elucidate a 'chronology of construction of the structure and identify the structure's function for this triadic complex (Wilkinson and Hude 2011:9). The researchers note that there was no evidence of prior excavation or looting in the group. The unit was closed after reaching a depth of approximately 1.5 meters.

After the conclusion of excavations in the triadic complex, an excavation unit was established in the center of the ball court. In sum, the excavations recorded multiple periods of construction for both features. The excavation unit in the ball court revealed polychrome ceramic sherds and a cobble, ring-shaped, hollow feature in the ground which contained "rubber encased in a clay-like matrix" (Wilkinson and Hude 2011:13). Researchers acknowledged that ceramic analysis had not yet been undertaken however,

maintain that the ball court experienced several distinct construction phases including a phase of marl construction (Wilkinson and Hude 2011:13).

Excavations initiated in the 2011 field seasons focused on plaza G in addition to a wall-like feature that was identified upon further survey and mapping of the site core. Located north of the ball court, Plaza G is a formal plaza flanked by a low-lying platform to its south. Excavation units were established along the eastern structure (G28) of the plaza to determine construction phases (Guerra *et al* 2012:111). It was in this structure that Burial 002 was recorded and retrieved.

Burial 002 was located beneath a cover of six fragmented limestone capstones and 15cm of sandy, reddish-brown matrix. It was noted to have been in an extremely poor state of preservation. The individual was oriented with head to the south and feet to the north. Jade inlaid incisors, a small olla, a cylindrical vessel and twenty five shell beads were among the grave goods recovered from the burial (Guerra *et al* 2012:113).

Further, excavations conducted in G-30-2 recorded a poorly preserved plaster floor. Beneath this floor was cobble with the absence of artifacts, below the cobble was a marl floor (Guerra *et al* 2012:114). The architecturally aligned, wall-like feature was excavated until time constraints ended excavation of the feature.

The focus of the 2012 field season was centered in Plaza F. Horizontal excavations focused on the eastern and southern structures, Str. F-25, and Str. F-26 respectively. A substantial effort was made in 2012 to expose the terminal architecture on the plazas southern structure. Ultimately, time constraints halted excavations until the following field season (Guerra *et al*. 2013).

Finally, 2013 revisited Plaza F and exposed a staircase in the center of the southern structure. Based on the ceramic analysis of the termination deposit this phase of construction dates to the Late Classic Period. It should be noted that the bulk of archaeological work conducted at the site thus far has focused on horizontal excavations, by this method only the terminal phase of occupation can be studied. Moreover, ceramic analysis has not yet been formally conducted and published however recent excavations in Plaza G reveal evidence of Early Classic Period occupation (Guerra *et al*. 2015). Settlement survey was again initiated in 2013. The survey consisted largely of reconnaissance. The pedestrian survey was mainly conducted in a pasture just to the south of the site core. Upper and Lower Barton Creeks served as the eastern and western boundaries while the Western highway served as the survey's southern boundary.

These boundaries were generally adhered to, and were set arbitrarily (Petrozza *et al*. 2014). More intense survey was conducted during the 2014 filed season. After the feasibility survey more clearly delineated survey boundaries were established (Petrozza *et al*. 2015).

From this point forward I refer to Lower Dover also as "Barton Ramie South", this is to assuage any confusion regarding the intention of this thesis. The reasoning behind this is discussed further in the section titled "Discussion". It is important to remember that there is a huge contrast between past realities and the way that modern society conceptualizes things. In modern society rivers are often perceived as boundaries dividing space whether it be between states, countries, and even counties or provinces. However, in ancient Mesoamerican society, rivers were a focal point providing the necessities of life. This is especially apparent in the settlement patterning of the Belize

Valley “ribbon strip”. In modern society we conceive of rivers and waterways as natural boundaries rather than necessities of life ways. Ancient society had to capitalize on waterways to sustain life, and expand trade.

II. METHODOLOGY

Survey

The scope of the survey was defined by following literature which has become standard in settlement survey in the area. This states that in the Belize River Valley "Ribbon Strip" of settlements one could observe that ceremonial centers are approximately 9.9 kilometers apart from one another (Garber *et al.* 2004).

The criterion to discern major and minor ceremonial centers is concisely delineated by Helmke and Awe in chapter one of this thesis. However, to elaborate more on this, a Classic Period Maya kingdom would typically consist of a major center (sometimes more), and minor centers that acted as satellites to the major center. Between these areas one would find agricultural fields and commoner residences. This pattern repeats continuously, albeit irregularly, across the Maya lowlands culminating in what Willey termed the "ribbon strip" of settlement following the Belize River (Demarest 2004; Willey *et al*. 1965).

A two kilometer radius was established around the ceremonial center of Lower Dover (Barton Ramie South), however this encompassed the entire Barton Ramie settlement. Therefore, the Belize River served as the northern boundary of the survey as Barton Ramie had been mapped and investigated thoroughly by Willey in the 1950's and again by Errin Weller in 2009 using remote sensing analysis of satellite imagery and GIS (Willey et al. 1965, Weller 2009), thus no further physical investigation of the site was conducted or deemed necessary.

Following this, the scope of the study area was established within a two kilometer radius of the ceremonial center. Two kilometers was chosen to encompass the settlement area and complete a regional survey for the BVAR Project. Once this arbitrary boundary was delineated in ArcGIS, the survey area was divided into quadrants: northeast, southeast, southwest, and northwest.

The center of the quadrants were based on the existing permanent datum (South Datum) established at the site core in Plaza B, recognized and permanently recorded by the Belize Valley Archaeological Reconnaissance Project . This datum served as the originality point for Global Positioning System (GPS) calibration at the start and end of each survey thus ensuring consistency. Within each of these four quadrants transects were established running north and south using a survey transit establishing a grid. Distance between transects varied generally between three and seven meters, increasing and decreasing based on visibility in the thick jungle vegetation. While walking these transects straight lines running north and south were maintained through the use of a survey transit. The survey transit maintained directionality and was pointed at a marker on the horizon one could identify while walking towards hence serving as a heading or azimuth. Archaeological features were recorded using a Garmin GPSMap 78 handheld GPS unit with an accuracy of $\pm$ 3m and input as waypoints.

The handheld GPS unit was set to record coordinates using a northing and easting in Universal Transverse Mercator (UTM) projection utilizing the North American Datum 1984 (NAD1984). Archaeological features were identified as anomalies in the corresponding terrain or features identified by the Laser Illuminated Detection and Ranging (LiDAR) survey and corresponding shovel tests. For example, areas containing

a high volume of surface artifact scatter, areas with different elevation reminiscent of a buried structure, or areas with clearly delineated or exposed architectural alignment.

The height, length, and width of archaeological features were recorded using a temporary datum and measuring tape so that the architectural volume of the periphery could be synthesized for various statistical analyses. As features were recorded a small sample of diagnostic surface artifacts were collected. These artifacts consisting of ceramics were collected for analyses that could assist in establishing the terminal chronology of occupation in the settlement zone and further aid in understanding inter-site movements and interaction.

In some circumstances, with the larger architectural features it was necessary to map the structures. An electronic theodolite, or "total station" was not readily available at the time of this research therefore mapping was done with the tape and compass method. The map was later georeferenced using the LiDAR data. The temporary datum served as the point of origin and an azimuth was taken with the compass in the direction intended to be mapped. Distance was measured using a 30 meter metric measuring tape. A 'peg' was used to mark the next point, for example the corner of a building. From this point the process was repeated until the feature was mapped in its entirety. Once the measurements were taken a map was produced on metric graph paper with an appropriate scale. Using a 360^{o} protractor the map was drawn according to the recorded azimuths.

Shovel Testing

Shovel testing is common practice in North American Archaeology. Mostly it is used to elicit reliable supporting data by adding a subsurface investigation when conducting survey. This is exceptionally beneficial when surveying in areas that have endured cultural or natural transformations. For example, a plowed field, or a natural flood plain. In both instances surface materials are moved from their point of origin, shovel testing and other methods of subsurface probing can aid in verifying the extent of archaeological features (Renfrew and Bahn 2012). In regard to this research, shovel testing served the same purpose and followed the Cultural Resource Management (CRM) protocol shared by many CRM firms in the United States. Shovel testing penetrated no deeper than 40cm and were initiated at the center, or as close to the center, of each suspected archaeological feature identified by the survey. The diagnostic ceramic samples that were collected during the survey were analyzed and classified according to Gifford's ceramic typology of Barton Ramie. It should be noted that the shovel tests were never intended to provide a complete chronology, rather they were meant to establish a preliminary chronology detailing the phases of terminal occupation while additionally contributing a subsurface component to the survey. As these shovel tests did not penetrate the surface deep enough to provide a complete chronology for each individual structure, vertical excavations focused on a large group in the settlement area.

Excavation

Due in part to the amount of time needed to excavate a valid sample of Lower Dover's (Barton Ramie South) settlement area, the excavations focused on Group 1. Excavations were carried out in order to establish a chronology that could serve as a starting point in which to gauge the terminal occupations of the house mounds sampled in the settlement area. Group 1 was specifically chosen because of its proximity to a cave, and because it rests on one of the highest points of elevation in the survey area.

Moreover, due to the seemingly restricted access of Group 1 and its proximity to a cave, it was hypothesized that the group served a ritual function and could possibly be used to elicit the earliest date possible. As such, temporary datum were placed to record horizontal and vertical measurements during excavation.

The baseline of excavations generally followed cardinal directions. However, in areas where this was not feasible, such as architecture not following an ideal cardinal directional path, the baseline followed the path of the architecture. The data collected was recorded according to cultural levels however, in the absence of cultural levels arbitrary levels were used. Both were recorded in addition to a chronologic lot system that aided in the organization of context for the data recovered.

The lot system implemented in this research was arbitrarily started at lot 100 with the prefix LWD for Lower Dover (Barton Ramie South). In this research it is chronological, and established so that future research can easily start where previous research ends. This allows future researchers to note the exact order and place that artifacts were recovered through the history of research at the site. Additionally, each lot

is accompanied by a form which offers a general description of the area, sediment, and condition of finds. Every group of artifacts collected whether it be from survey, shovel tests, or excavations has a lot number associated with it.

In some circumstances during this research looters trenches were used to save time eliciting artifacts that could be used to establish a chronology of occupation. In these cases the walls or 'baulks' of the looters trenches were photographed extensively. Afterwards, the baulks were cleared of weathered sediments making it easier to delineate cultural levels, such as plaster floors. Each level was assigned a numerical value, then recorded, and any artifacts recovered were included in the ongoing lot system.

LiDAR Analysis

LiDAR or "light detection and ranging" is a remote sensing technology that measures distance by emitting a laser thus, illuminating a surface and analyzing the reflected light. Developed in the 1960's its original application was in the field of Meteorology. At that time the technology was used in order to accurately measure distance by calculating the amount of time it took for the laser to reflect back to its point of origin this was specifically used by the National Center for Atmospheric Research to measure the size of clouds (Goyer *et al.* 1963:568).

LiDAR is quickly becoming an increasingly important tool to assist in the mapping and recording of archaeological sites around the world. This is due to the fact that an analyst can create an algorithm in which, obstructions such as in this case, jungle canopy, can be excluded from the reflected light, otherwise known as a return. More simply, an analyst can provide archaeologists with a clear picture of the ground surface

without the interference of the thick vegetation that is commonly associated with 'undiscovered' archaeological sites generally due to their lack of accessibility.

Moreover, the technology is commonly applied in the field of archaeology to create detailed maps. The data can be overlaid onto existing maps in programs like ArcGIS or online mapping services that utilize a sophisticated satellite technology allowing users to visualize the exact location or layout of a site in relation to its geographic topographic terrain.

This can be helpful in providing the archaeologist with the opportunity to plan how research will be conducted. What areas will require more man power, more intense survey, or identify areas which will be most beneficial to spend time and effort are questions and concerns that are omnipresent during any archaeological investigation. In the latter half of conducting this research LiDAR data became available through a grant award that encompassed significant portions of the Belize River Valley (Awe *et al*. 2015).

Ceramic Analysis

The diagnostic ceramic samples that were collected during the survey and shovel tests were analyzed and classified according to Gifford's ceramic typology of Barton Ramie (Gifford 1976), (Table 5). This consists of a basic type-variety method that is commonly used by Mayanists.

James Gifford established a ceramic typology based on the artifacts he helped gather as part of the Peabody research with Gordon Willey. It was Gifford who was charged with establishing the type-variety assemblage of Barton Ramie (Table 1). Gifford analyzed every ceramic vessel and sherd found during the excavations and placed them in a chronologic sequence.

The analysis performed for this research is based upon his work. After collecting and cleaning the ceramic artifacts they were laid out and diagnostic samples were sorted. Diagnostic samples were selected based on the most readily identifiable stylistic attributes. For example, a unique color that Gifford noted only occurs in a certain time period, a basal flange that is stylistically identifiable only once or twice, sherds from rims and bases of vessels, body sherds of vessels which displayed unique stylistic characteristics, handles, and spouts. Once these artifacts were identified they were compared to the artifact assemblage of Barton Ramie.

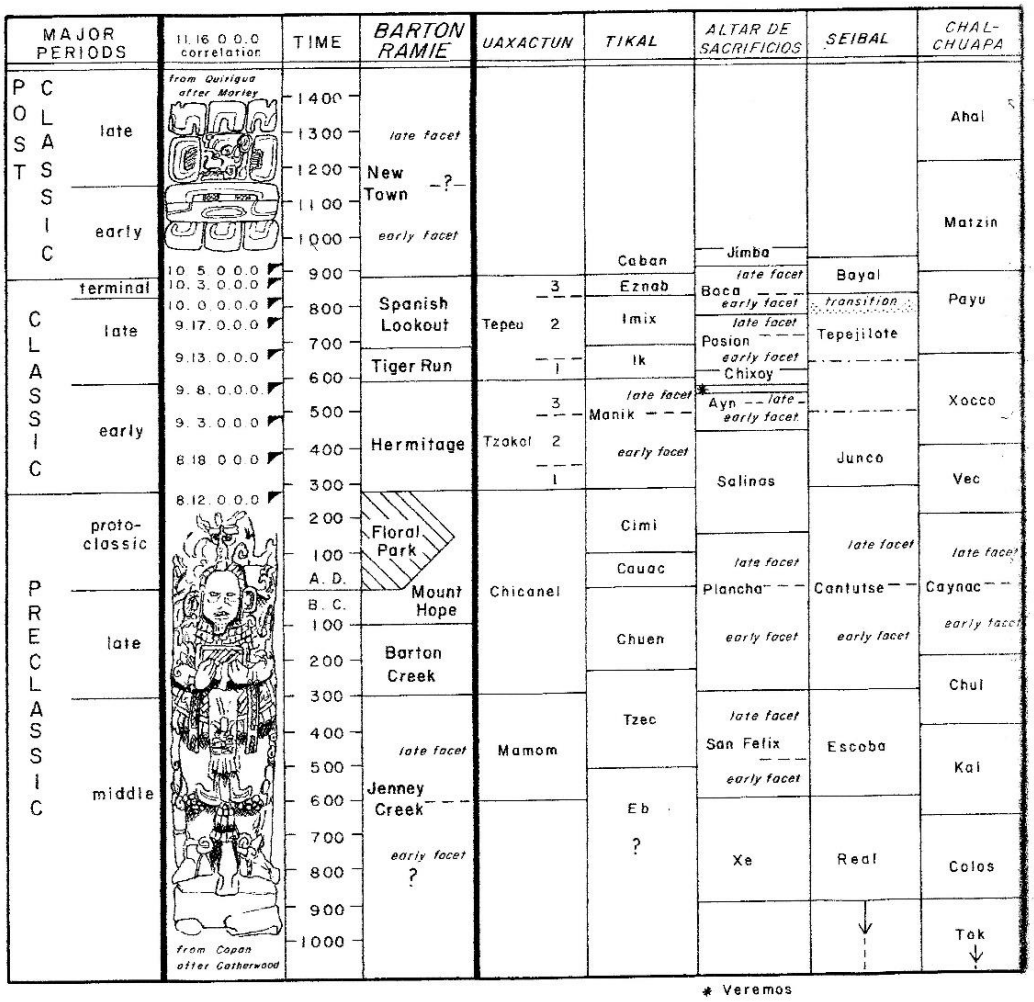

Table 1. Barton Ramie Ceramic Phases (from Gifford 1976: Fig. 8).

Statistical Analyses

The statistical analyses in this study are based on the statistical equations of Ricketson and Ricketson (1937) at the site of Uaxactún in the Petèn, Guatemala. Although there are several ways that an anthropologist might derive a statistical population estimate, I chose this one for consistency. It is the same population estimate that Willey (1965) used to determine the population for Barton Ramie.

Although in this particular equation, the investigator assumes that there are five occupants per household. The number of occupants can vary depending upon the insights and discretions of the investigating anthropologist. However, a variation of this analysis is generally used to determine populations in the Belize River Valley.

"Ricketson computed persons per square mile of habitable land by multiplying the 78 house mounds from the sample area by the standard 5 persons per house (78x5 equals 390) and then by projecting his sample area, which was considerably less than a square mile (only 1,140,000 sq. yd.), to a full square mile. The resultant figure he gives as 1083.35 persons per square kilometer" (Willey et al. 1965:9).

Moreover, "Ricketson applied a reduction to these gross figures by estimating that only 25 percent of the house mounds were occupied at any one time. Thus, he emerged with 270.83 persons per square mile or 104.55 persons per square kilometer" (Ricketson and Ricketson 1937:15-16; from Willey *et al*. 1965: 9-10). As Willey (1965) noted, the Ricketson's published equations in both metric and standard measurements. For Willey's research and this paper units will be measured in metric.

III. RESULTS

Survey

The survey of Lower Dover (Barton Ramie South) settlement yielded a plethora of archaeological data (Table 2, 3) contributing to the understanding and documenting of the site. In sum, the survey located and recorded two chultunob, two caves, agricultural terracing, and sixty mounds (Figure 6, 7). The two kilometer radius of the boundary was an admittedly formidable undertaking in the time allotted for this thesis.

With the two chultunob recorded, LWDCH2 (Lower Dover Chultunob 2), located closest to the southern boundary of the survey was subsequently excavated (Figure 8). With the limestone capstone intact, the artifacts retrieved were ceramics, chert, and faunal remains (Perkins *et al*. 2014).

Like Willey's Barton Ramie survey most of the mounds at Lower Dover (Barton Ramie South) are between .30cm to 3.50 meters in height, aside from mounds 132,136,138, and 140 which are below .30cm. Thus, all can be described as "ordinary house mounds" according to Willey's three category criterion (Willey *et al.* 1965:34). Most of the mounds are clustered around the southern portion of the Lower Dover (Barton Ramie South) site core. The mounds at Lower Dover (Barton Ramie South) are spaced between seven to ten meters apart.

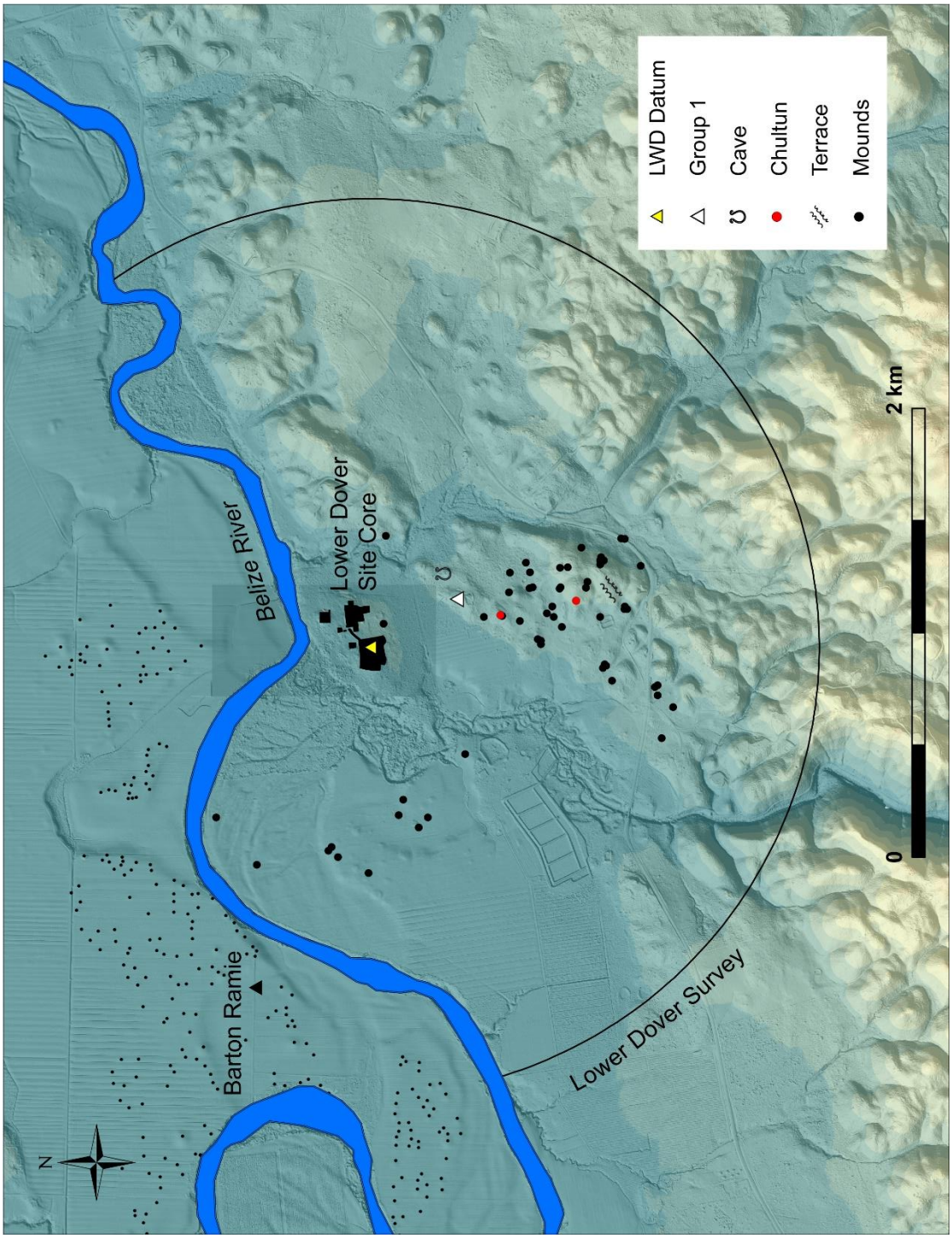

Figure 6: Lower Dover (Barton Ramie South) Settlement Survey.

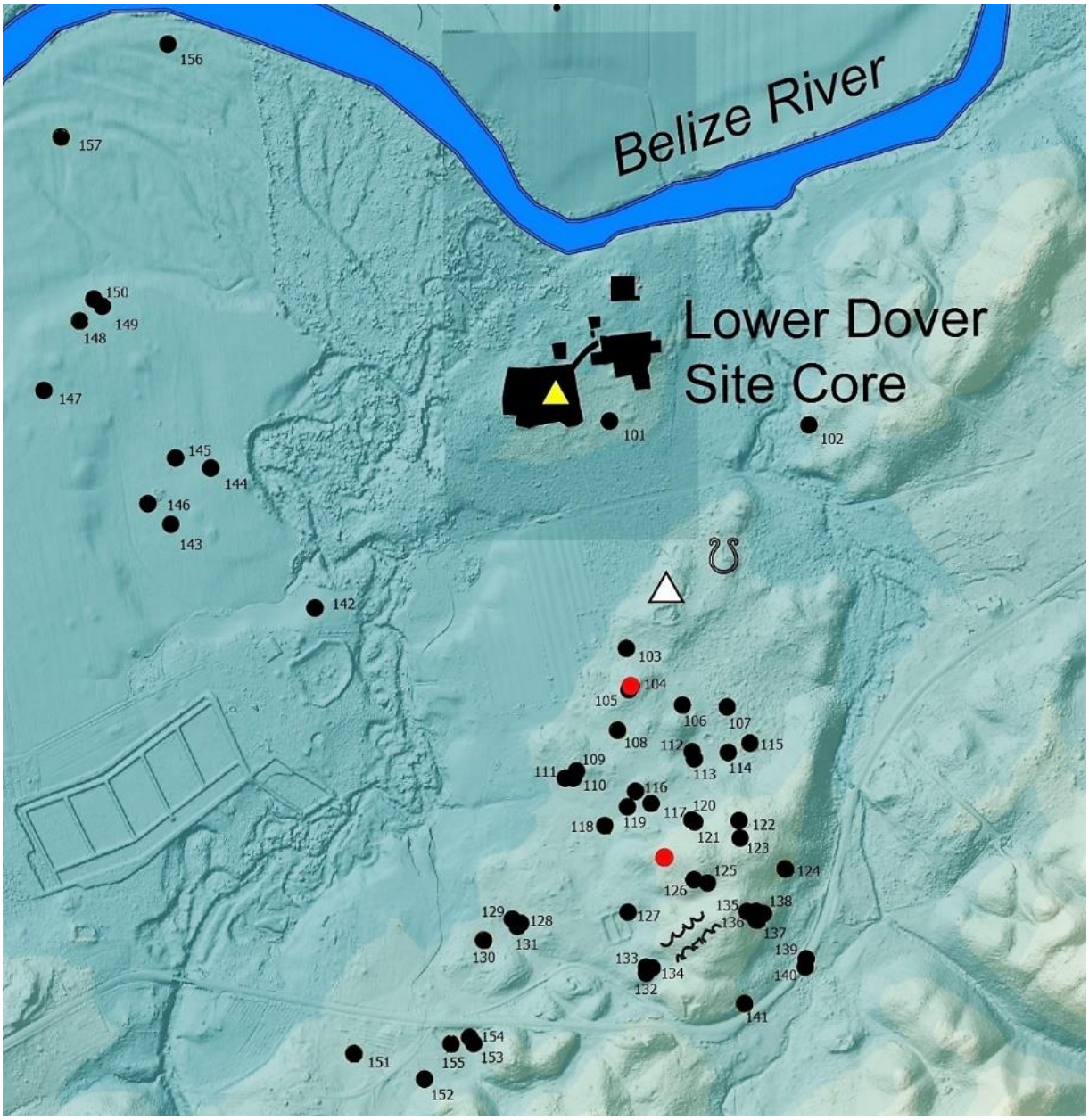

Figure 7: Lower Dover (Barton Ramie South) House Mounds.

Figure 8: Lower Dover Chultunob (LWDCH2).

Mound	Arc. Vol.	Mound	Arc. Vol.
101	41.23	130	70.0128
102	59.22	131	17.85
103	63	132	36.5
104	57.1242	133	33
105	117.0468	134	53.2
106	45.85	135	35.45
107	51.625	136	57.75
108	31.977	137	17.39
109	67.13	138	19.89
110	84.525	139	1375.14
111	105.742	140	42.96
112	95.55	141	861.06
113	25.41	142	710.437
114	41.201	143	3640.56
115	18.8235	144	213.624
116	15.741	145	240.8016
117	15.732	146	30.01
118	37.2172	147	103.53
119	115.6381	148	103.53
120	35	149	491.15
121	42.34	150	131.25
122	194.376	151	3675.25
123	47.515	152	51.3
124	126	153	64.24
125	83.64	154	24.75
126	92.86	155	28.8288
127	117.52		
128	29.9367		
129	205.3888		

Table 2. Architectural Volume of Lower Dover (Barton Ramie South) Settlement.

Mound	LxWxH	Mound	LxWxH
101	7mx9.5mx62cm	131	1.7mx7mx1.5m
102	9mx7mx94cm	132	7mx6.5mx10cm
103	7mx7.5mx120cm	133	7.3mx6mx30cm
104	8.7mx6.7mx98cm	134	8mx7.3mx1.10m
105	8.2mx7.8mx183cm	135	5mx5.5mx80cm
106	7mx5mx131cm	136	6.2mx5mx20cm
107	12.5mx7mx59cm	137	7.5mx6mx50cm
108	5.7mx5.5mx102cm	138	17mx11.7mx10cm
109	7mx7mx137cm	139	41mx19.5mx1.72m
110	7mx7.5mx161cm	140	24mx17.9mx10cm
111	7mx8.3mx182cm	141	22.6mx30mx1.27m
112	7.5mx7mx182cm	142	25.9mx21.1mx1.30m
113	11mx5.5mx42cm	143	42mx44mx1.97m
114	7.3mx6.8mx83cm	145	23mx17.2mx54cm
115	4.7mx4.5mx89cm	145	22.7mx15.6mx68cm
116	4.5mx5.3mx66cm	146	Surface Scatter
117	6mx4.6mx57cm	147	10mx7mx43cm
118	8.3mx5.9mx76cm	148	17mx8.7mx70cm
119	10.9mx10.3mx103cm	149	29mx22mx1m
120	7mx5mx1m	150	23.5mx22mx95cm
121	7.3mx5.8mx1m	151	17.5mx12.5mx60cm
122	12mx18.2mx89cm	152	16.5mx15mx90cm
123	8.6mx6.5mx85cm	153	12mx9.5mx45cm
124	10mx10mx126cm	154	8mx7.3mx1.10m
125	12mx8.2mx85cm	155	5mx5.5mx90cm
126	10mx8mx116cm	156	7.8mx5.6mx66cm
127	13mx8mx113cm	157	6.4mx5mx60cm
128	9.3mx8.7mx37cm	158	Surface Scatter
129	11.3mx12.8mx1.42m	159	Surface Scatter
130	8.8mx7.8mx102cm	160	Surface Scatter

Table 3. Lower Dover (Barton Ramie South) Mound Dimensions.

Shovel Testing

Shovel testing in the Lower Dover (Barton Ramie South) periphery was conducted to elucidate the terminal phase of occupation. A 20% sample (eleven mounds) of the settlement was shovel tested. This avenue of research was chosen because the time allotted, and other logistical constraints during research for this thesis did not make it feasible to excavate a valid sample of house mounds to bedrock or cultural sterile in order to establish a chronology of occupation within the settlement.

It is worth mentioning that this was the first research conducted in the Lower Dover (Barton Ramie South) periphery. As such, there was no way of accurately discerning how deep bedrock or cultural sterile would be. In the preliminary stages of my research proposal it was decided that if even one of the house mounds dated as far back as the Preclassic Period, I might not even be able to complete excavation on one house mound considering bedrock at surrounding sites was never reached even at depths of nine meters.

Instead shovel testing would allow me to retrieve a sample of artifacts from a 20% sample of house mounds in the settlement in a fraction of the time. They were conducted so that a preliminary chronology of terminal occupation could be gleaned and additional data from the settlement could be retrieved. Unfortunately, this was not a beneficial method. The shovel tests penetrated no deeper than 40cm and were initiated at the summit of the house mounds (Figure 9).

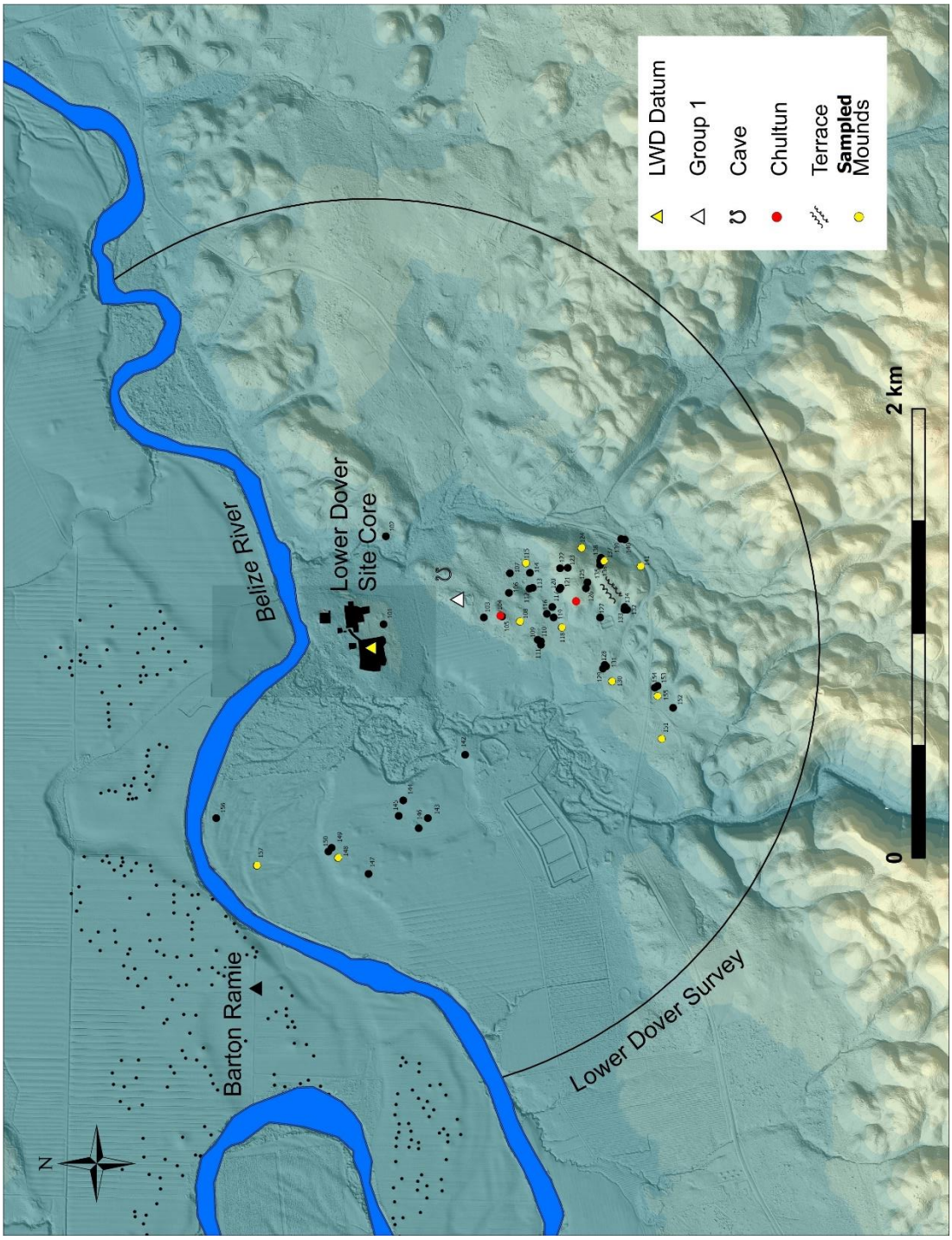

Figure 9: Map of Shovel Testing.

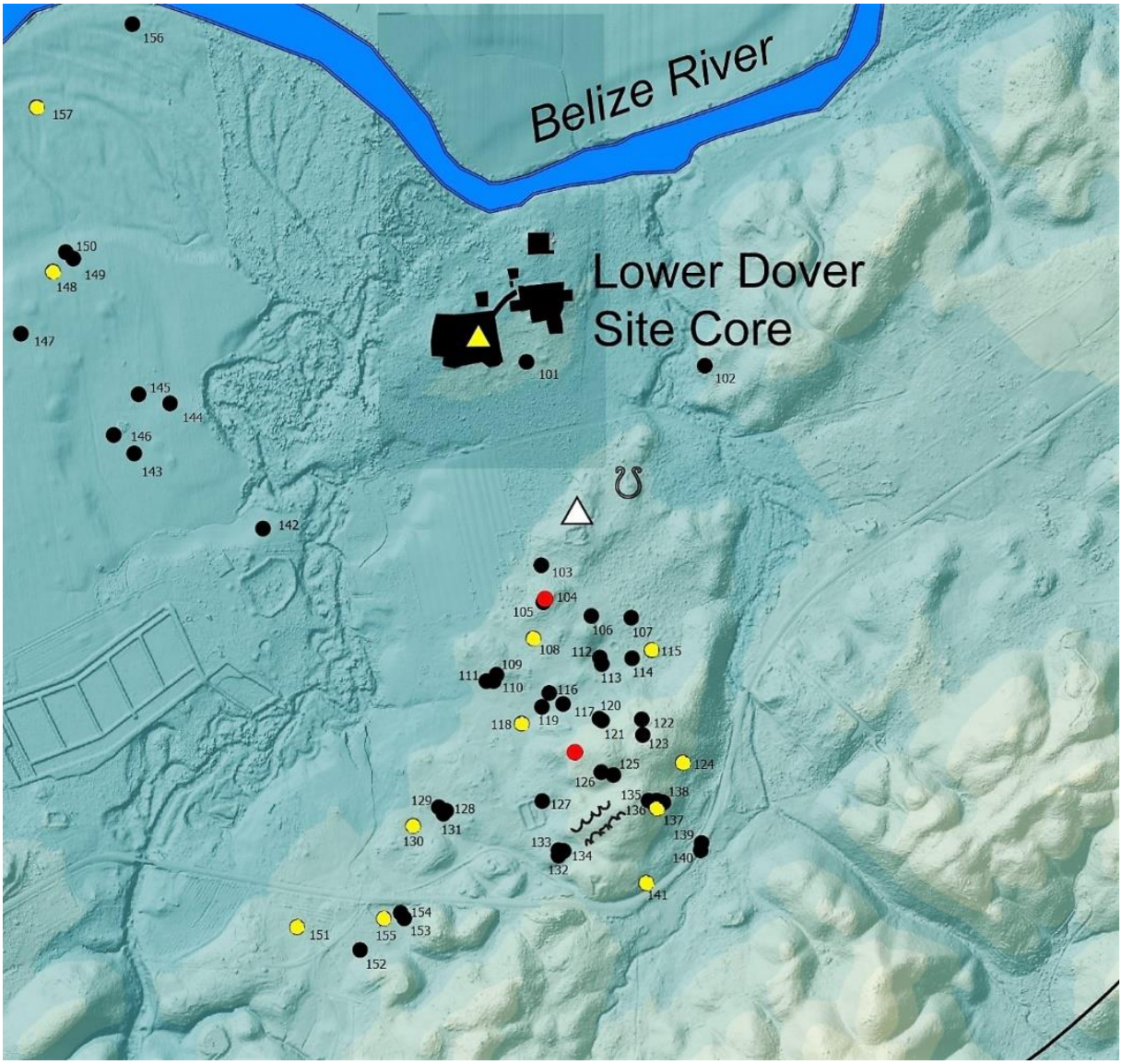

Figure 10: Sampled House Mounds.

In fact, in all cases the tests yielded little diagnostic material at all. Some ceramic Polychrome sherds (Figure 11) were retrieved from a house mound that may be from the Classic Period however nothing was definitively identified.

I had hoped that more could be discerned from the shovel tests, however the only definitive solution for accurately dating any phase of occupation at Lower Dover (Barton Ramie South), is systematic chronological excavation.

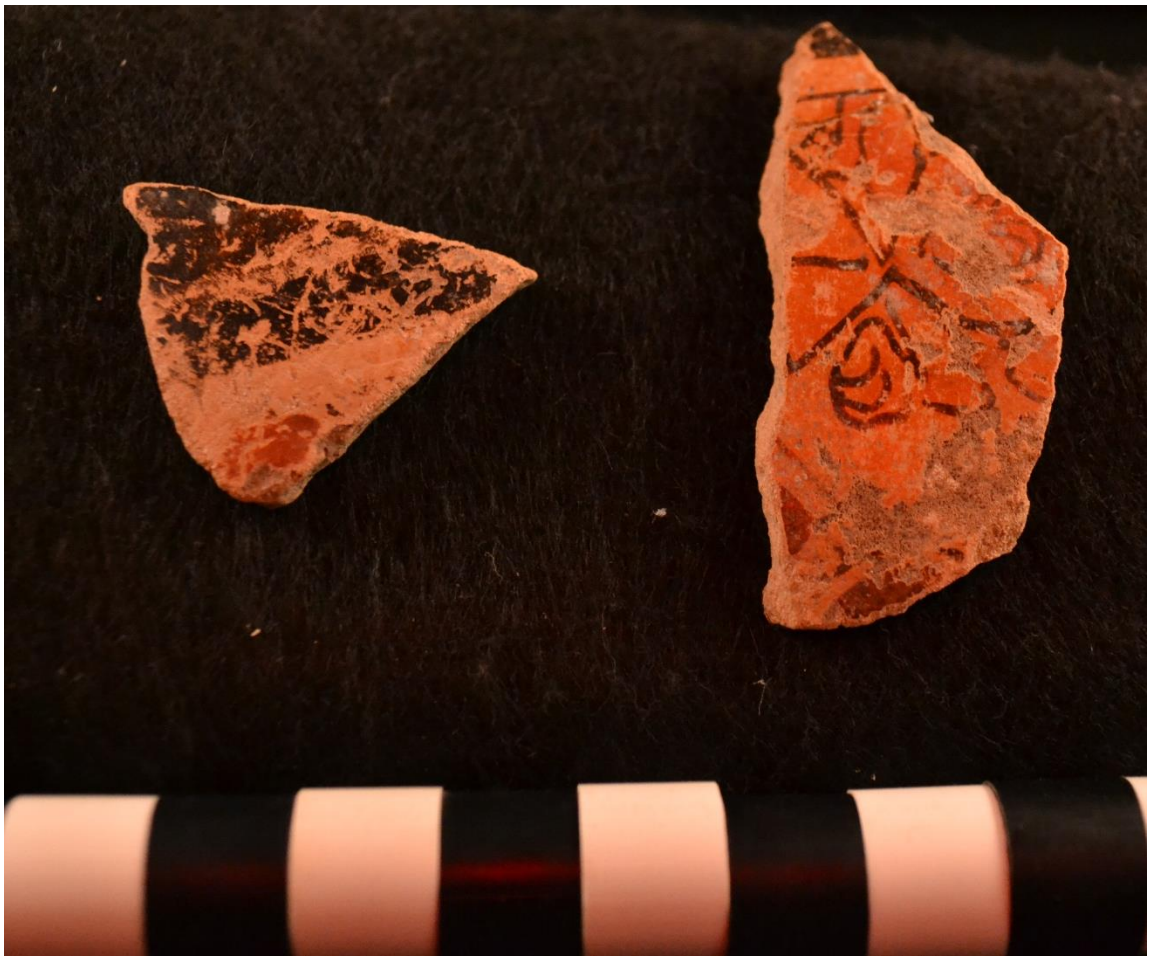

Figure 11: Ceramic Polychrome Sherds from the Lower Dover (Barton Ramie South) Settlement.

LiDAR Analysis

LiDAR data comprising of a two kilometer radius around the Lower Dover (Barton Ramie South) site core was analyzed in ArcGIS 10.2 software. As a high percentage of the survey area was in dense jungle terrain and in the foothills of the Maya Mountains. The availability of this tool was crucial to match the scope of this research.

LiDAR data was converted into an LAS data set in ArcGIS 10.2. This can be created using either the "'Create LAS Dataset' geoprocessing tool or the folder context menu" (resources.arcgis.com). The data was then able to be viewed in 3D using the ArcGIS 10.2 application ArcScene. When viewed in 3D the LAS data set makes it possible to see anomalies in the terrain more clearly and benefitted preparations for pedestrian survey enormously, as it provided insight into areas that were difficult to reach on foot. However, the program was largely used to analyze the LiDAR data from a 2D cross-sectional view. This made it possible to analyze areas within the survey boundaries where pedestrian survey would be most time consuming. Within the ArcGIS software a preset can be established to set transects at various intervals. Therefore, the user is essentially conducting survey remotely based on the return signals that the LiDAR analyst has provided in the dataset. As stated, while this technology is revolutionizing the way that archaeological sites are identified and mapped, it was not in any way a substitution for pedestrian survey in this research. Rather, it contributed yet another level of analysis albeit an extremely helpful and efficient one.

Due to the dense jungle growth and steep jungle covered slopes of the Maya Mountain foothills, located within the survey boundaries, a project of this scope could only have been met with the conjoining of pedestrian survey and a small section of the

LiDAR survey which was made available to me by Jaime Awe (see Awe et al. 2015). In addition to the pedestrian survey the use of LiDAR identified fifty additional anomalies. Of the fifty anomalies, twenty of them were able to be verified as archaeological features.

Excavation

Group 1 (Figure 12) is a heavily looted group of five structures however, it was chosen because of its location in the settlement area. Resting on a high plain of elevation the group overlooks the site core, from here one can observe Barton Ramie, Lower Dover (Barton Ramie South) and the meandering Belize River. Moreover, its close 30 meter proximity to a cave (Figure 13) was also taken into account.

Additionally, its seemingly restricted access suggested that this group likely served some specialized ritual function and therefore was probably conceived in the earlier phases of the sites construction and could be used to elicit the earliest date possible with which to approximate the settlement areas occupational origins. This resulted in excavations that were focused within this group. Implemented to retrieve ceramic samples to relatively date the group excavation unit PL1-1 was established. This excavation unit was 2x2 meters at its start. It was centered at the base of the northern structure of Group 1.

This unit consisted of three levels, the first of which ultimately reached 67cm. At a depth of 20cm into excavations of the first level a poorly preserved plaster floor emerged and was photographed. The floor, devoid of architecture or any other features, including artifacts aside from *pachychilus,* a type of fresh water shell, was broken through. At the start of Level 2 the excavation unit was scaled down to 1x2 meters.

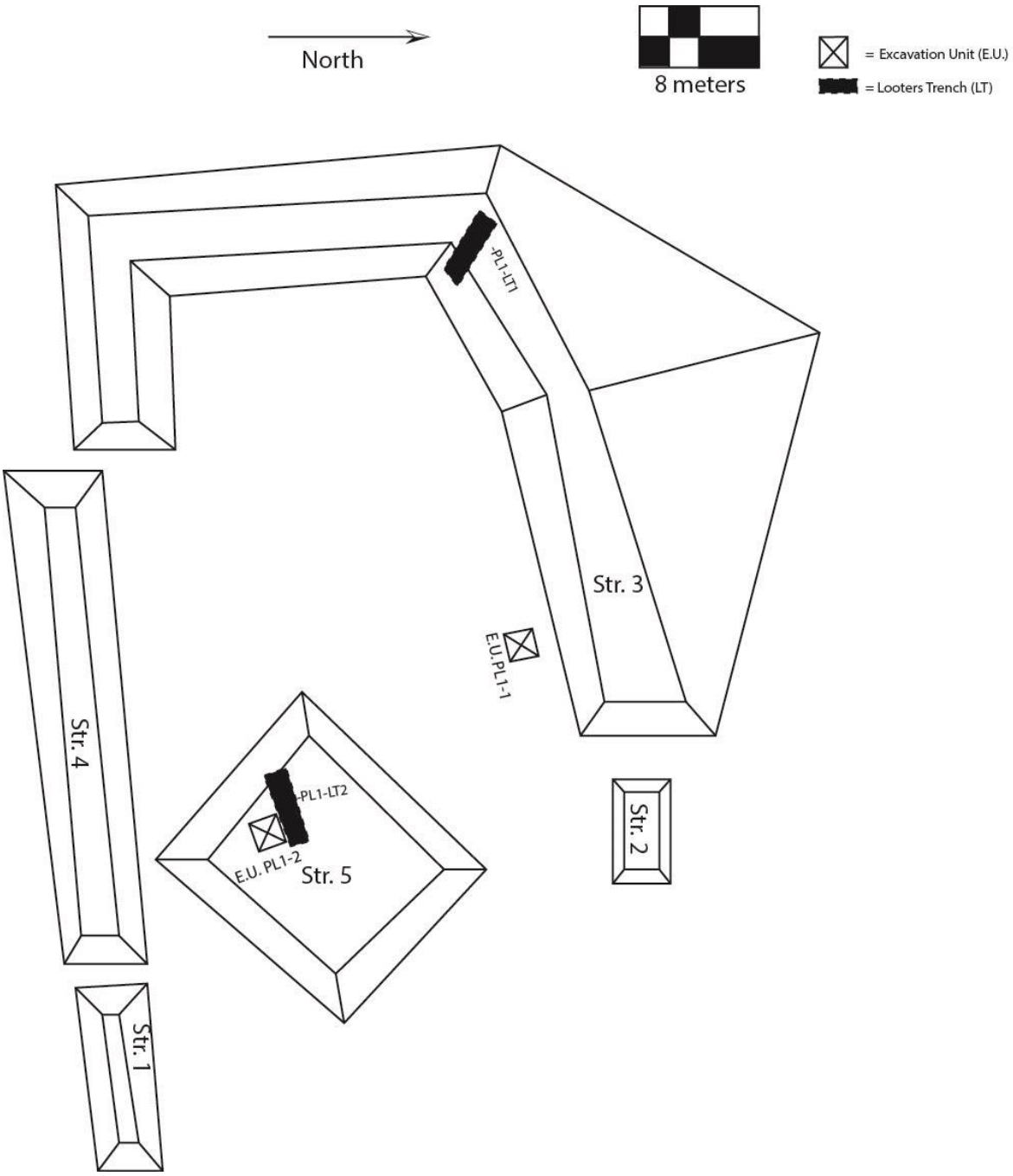

Figure 12: Map of Group 1

Figure 13: Entrance to Cave near Group 1.

Level 2 consisted of cobble fill devoid of any artifacts again, aside from *jute*. At this level it became apparent that the *jute* was actually being brought up to the surface from an animal borough therefore, any artifacts recovered from this cobble fill were likely the result of bioturbation.

The cobbles were generally around the size of a baseball and very loosely packed. Its consistency could be best described as 'excavating in backfill', that is an area that had already been excavated before. This fill was easily removed and continued to a depth of only 16cm. This level was relatively devoid of artifacts aside from the occasional *jute*, crumbled pieces of undiagnostic ceramics, and a single piece of broken jade bearing no visible representations.

Level 2a was a huge shell deposit. This level contained an abundance of *jute* and various other freshwater and marine shell. The deposit was 6cm thick and in the space of 1x2 meters contained 25,085 *jute* (Figure 14). Among the other artifacts retrieved were various shell pendants dating to the Middle Formative Period (Figure 15), beads, river clam, and conch shell. This deposit was on top of another plaster floor only slightly better preserved than the previous one.

After photographing and breaking through the plaster floor, Level 3 was initiated. This level was devoid of artifacts aside from a few remnants of the *jute* from bioturbation. This entire level consisted only of silt. Bedrock was struck at a depth of 101cm effectively ending the excavation (Figure 16).

Figure 14: *Jute* Deposit from Excavation Unit PL1-1, Lower Dover. For comparison, right side of excavation unit is undisturbed.

Figure 15: Middle Formative shell pendants from E.U. PL1-1, Lower Dover. Seen here arranged in the form of a necklace.

Figure 16: Excavation Unit PL1-1 in Group 1.

Due to an unfortunately lack of ceramic chronological assessment, a looters trench dubbed PL1-LT-1 in structure 3 was utilized. The baulks of the looters trench were cleared of foliage and debris in order to find clearly delineated plaster floors which displayed distinct construction phases (Figure 17). These clearly delineated floors were then treated as distinct levels.

It should be noted that no further vertical excavation was conducted and as Figure 15 illustrates the looters trench ended about .50 meters from the plaza floor. Later ceramic analysis would reveal that in the baulk of the earliest visible construction phase a Middle Preclassic cacao vessel spout and handle were identified (Figure 18). It should be pointed out that the cacao spout and were retrieved in *situ* from within the baulk.

A second excavation unit (E.U. PL1-2) was only initiated after investigating Looters Trench 2 (LWD-PL1-2-LT-2), (Figure 19) for additional ceramic material. This excavation was established on the heavily looted eastern structure (Str.5) of Group 1. Human remains were discovered while clearing the baulk for ceramic material. A 2x1.5 meter excavation unit was placed at the edge of the looters trench and excavated vertically to safely exhume the burial, dubbed Burial PL-1-001. Levels on this excavation were set arbitrarily. There were no architectural features in this excavation unit until 127cm.

Figure 17: Profile of Looters Trench 1 in Str. 3 of Group 1.

At 127cm nine roughly shaped limestone capstones appeared above the burial (Figure 20). It became apparent after further excavation that the capstones had shifted thus, severely damaging the preservation of the burial in the thoracic region. Resting atop these capstones was a bowl placed upside down. The bowl was shattered however, many of the pieces were present. The bowl was able to be partially reconstructed and was then photographed (Figure 21). The burial (Figure 22) was in a prone position face down with the head pointed south, left arm flexed towards the individual's cranium.

Artifacts associated with this burial were typical and included obsidian blades (Figure 23), an ash temper jar, three disc shaped ornamental marine shell beads found in association with a polished marine shell blade-like implement (Figure 24), drilled deer antlers and teeth, and finally, a river clam pendant. It should be noted that the majority of grave goods were clustered in the cranial region where evidence of 'bone stacking' was also present. Bone stacking occurs when the ancient Maya utilized a sacred burial area more than once, the older burial is kept in place but moved to the side in a 'bundle-like' configuration, leaving what appears to archaeologists as bones stacked atop one another.

Whether there were more artifacts near the individual's talocrural region to the north is unknown, as the looters trench destroyed that section of the burial along with the bottom half of the individual's legs from the *tali* down (Figure 25). However, there were some artifacts on the surface of the structure that one can only assume were discarded after they were deemed not profitable to the looters.

Figure 18: ‘Savannah Orange’ (Middle Preclassic) cacao spout (top) and strap handle (bottom).

Figure 19: Profile of Looters Trench 2 in Str. 5 of Group 1.

Figure 20: Capstones above Burial PL-1-001 (E.U. PL1-2) in Str. 5 of Group 1.

Figure 21: Reconstructed ‘Belize Red’ bowl recovered from Burial PL-1-001 (E.U.PL1-2).

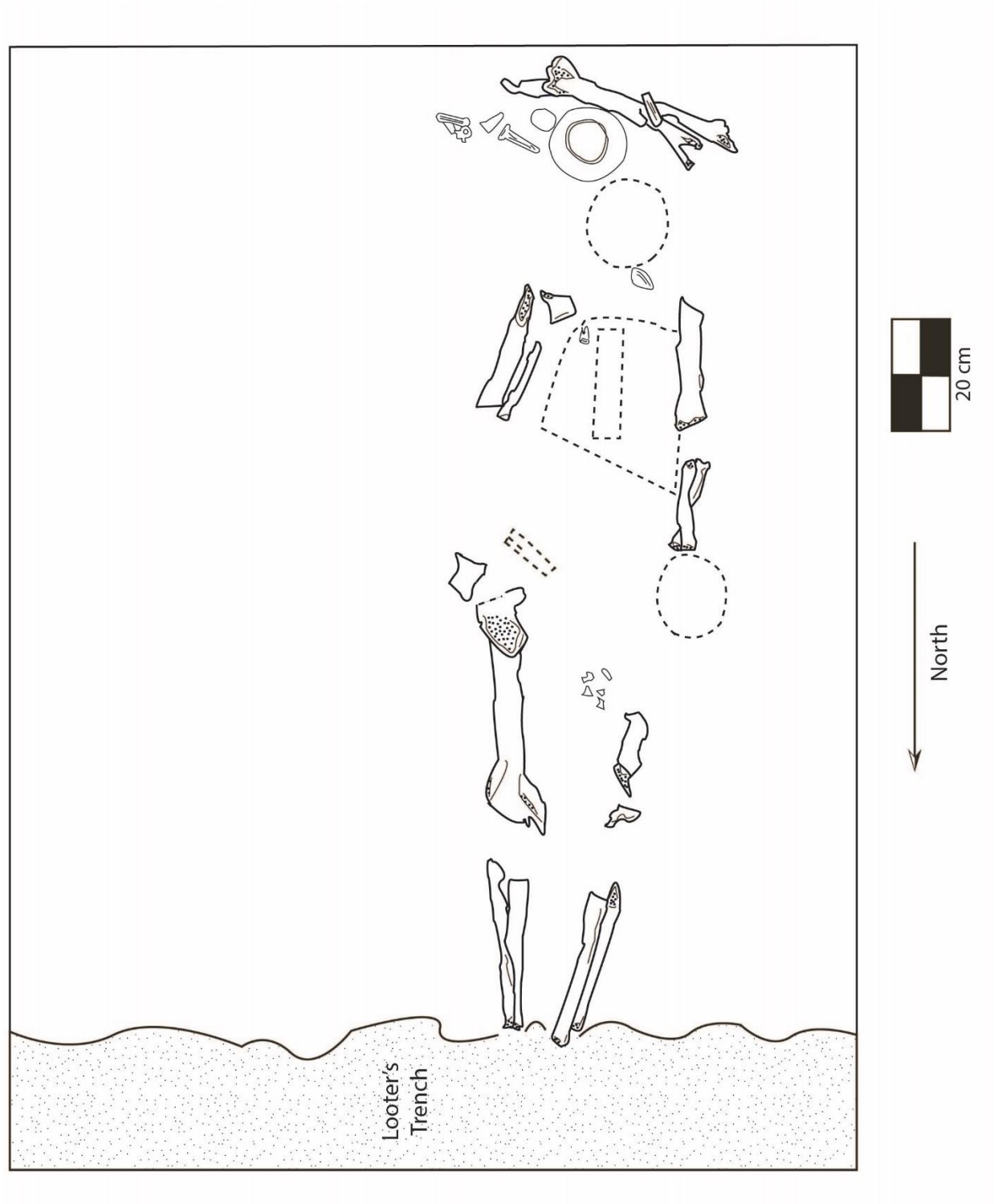

Figure 22: Map of Burial PL-1-001 (E.U. PL1-2) in Str. 5 of Group 1.

Figure 23: Obsidian Blades from Burial PL-1-001(E.U. PL1-2) in Str. 5 of Group 1.

The three obsidian blades were all found around the cranial region of the burial. All of the obsidian artifacts found in the settlement were sent to the archaeology laboratory at the Pennsylvania State University in State College PA to be sourced via pXRF. Most of the obsidian originates in El Chayal, Guatemala however, there is one blade originating from San Martin Jiltoepeque (Table 4), (Ebert *et al*. 2015).

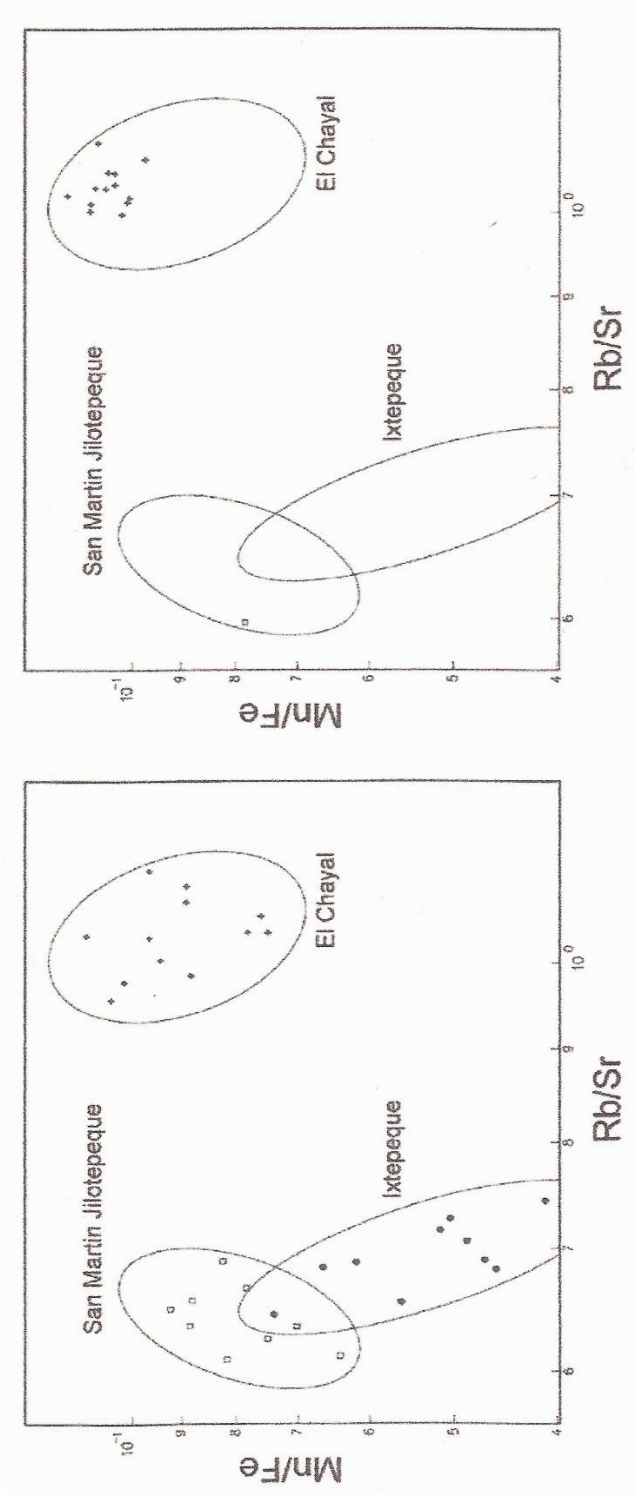

Table 4: Lower Dover (Barton Ramie South) Obsidian Sourcing. Bivariate plot showing geochemical source samples (bottom) and source assignments for the Lower Dover (Barton Ramie South) settlement (top). Ellipses represent 90% confidence intervals for group membership (from Ebert *et al*. 2015:Fig.1).

Figure 24: Ornamental Beads from Burial PL-1-001 (E.U. PL1-2) in Str. 5 of Group 1.

Figure 25: Burial PL-1-001 (E.U. PL1-2) in Str. 5 of Group 1.

The marine shell beads are carved and polished conch. Arguably, they could also be chank (Turbinella), however conch is more typical in the region (N. Stanchly, personal communication, October 31, 2014). The pendants are approximately the same measurements roughly the diameter and width of a U.S quarter with a slight bevel or curve.

Two of the three pendants feature a 'sprocket-like' design very articulately formed with holes in their center. Frontally viewed, these two pedants appear to be ear flares. This style is common in the Classic Period (Masson and Freidel 2002), and is frequently documented in the literature. The third of the series resembles a trefoil design and has a striking similarity to a royal knot discovered at the archaeological site of Cerros in northern Belize (Garber 1989). Finally, a series of Olivia 'tinklers' were also found in this cluster (Figure 26).

Most intriguing of the burial goods perhaps are the drilled deer antlers (Figure 27), after consulting with Norbert Stanchly (faunal analyst), his initial thoughts are that they are from a brocket deer (*Mazama sp*.) and not white-tailed. He informed that the only type of brocket deer in the region today are red brocket deer (*Mazama americana*) (N. Stanchly, personal communication, October 31, 2014).

I do not believe it is likely that these antlers were tools or used as hunting aides, as there are no other tools associated with this burial. Moreover, the area in which the individual was interred, coupled with the presence of a trefoil shaped pendant is typically denoting of a person associated with higher status and possible elite ties.

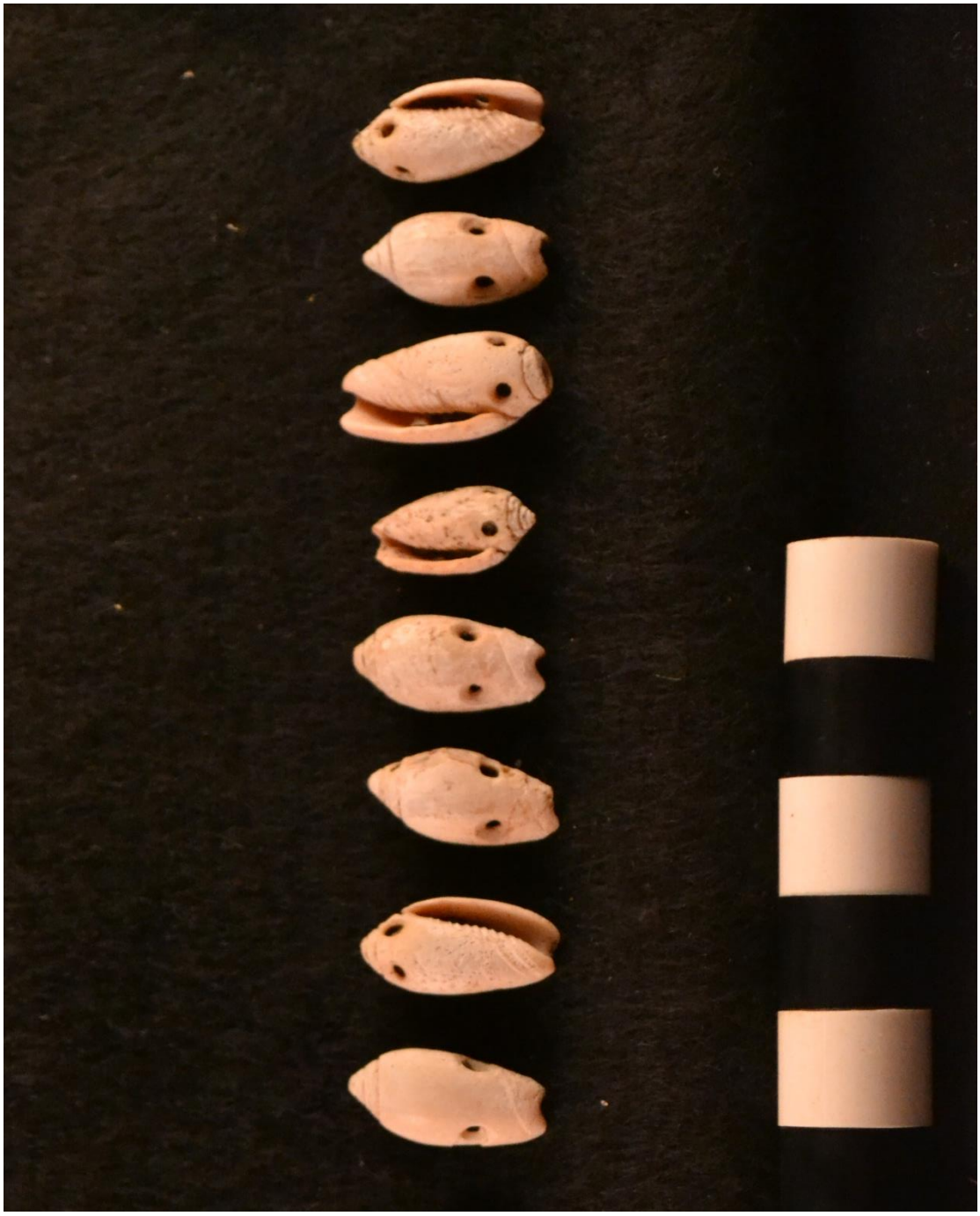

Figure 26: Oliva Shell ‘Tinkler’ beads from Burial PL-1-001 (E.U. PL1-2), in Str.5 of Group 1.

Figure 27: Drilled Deer Antlers from Burial PL-1-001(E.U.PL1-2) in Str. 5 of Group 1.

The deer antlers are drilled at their base and I believe that the accompanying shell pendants were likely affixed to something for example, a headdress. When depicted, the conservative iconography of Maya art commonly displays deer antlers, or in many cases complete heads, associated with some form of ritual activity (see Kerr 1989, 1990, 1992, 1997; Villacorta 1930). Cross cultural evidence is also overwhelmingly abundant in supporting the argument of headdresses and additional accoutrement symbolically representing transformative states during ritual practice among shaman (Eliade 1964).

The ash temper jar (Figure 28) measures twenty centimeters in height and thirty-eight centimeters in diameter. There is no slip or decoration on the jar. Therefore it probably functioned as a utilitarian vessel. Unique to this jar however is the lack of a base. The base of this jar is sunken rather than protruding which affords the jar little stability when placed on a flat surface. The jar was intact with nothing of note inside however, the jar was in a relatively poor state of preservation.

The river clam pendant (Figure 29) found in *situ*, was placed roughly five centimeters from the individual's neck. The shell was not manipulated in any way aside from the drilled hole to pass the lashing through enabling the wearer to tie it around the neck.

Figure 28: ‘Cayo Unslipped’ (Spanish Lookout Phase) Ash Temper Jar from Burial PL-1-001 (E.U. PL1-2) in Str. 5 of Group 1.

Figure 29: Freshwater Clam Shell Pendant from Burial PL-1-001 (E.U.PL1-2) in Str.5 of Group 1.

Ceramic Analysis

Lot Number	Ceramic Group	Form	Frequency	Type	Time Period
LWD-PL-1-LT-2	Belize	Bowl	1		Spanish Lookout
LWD-PL-1-LT-2	Belize	Ring Base	1		Sapnish Lookout
LWD-PL-1-LT-2	Cayo	Jar	1	Cayo Unslipped	Spanish Lookout
LWD-PL-1-LT-2	Sierra	Flat Base	1		Barton Creek
LWD-PL-1-LT-2	Polvero	Dish	1		Barton Creek
LWD-PL-1-141	Cayo	Bowl	7		Spanish Lookout
LWD-PL-1-141	Belize	Bowl	3		Spanish Lookout
LWD-PL-1-141	Belize	Solid Nubbin Foot	1		Spanish Lookout
LWD-PL-1-141	Belize	Flate Base	2		Spanish Lookout
LWD-PL-1-141	Belize	Ring Base	1		Spanish Lookout
LWD-PL-1-141	Belize	Body	1	Platon Punctated	Spanish Lookout
LWD-PL-1-141	Garbutt Creek	Bowl	3		Spanish Lookout
LWD-PL-1-141	Cayo	Bowl	6		Spanish Lookout
LWD-PL-1-141	Belize	Body	11		Spanish Lookout
LWD-PL-1-142	Belize	Body	4	Belize Red	Spanish Lookout
LWD-PL-1-142	Belize	Bowl	1	Belize Red	Spanish Lookout
LWD-PL-1-142	Chunhuitz	Dish	1	Benque Viejo Polychrome	Spanish Lookout
LWD-PL-1-142	Cayo	Jar	6	Cayo Unslipped	Spanish Lookout
LWD-PL-1-142	Cayo	Jar	1	Alexanders Unslipped	Spanish Lookout
LWD-Pl-1-142	Sierra	Bowl	1		Barton Creek
LWD-PL-1-142	Dos Arroyos	Dish	1		Hermitage
LWD-PL-1-142	Dos Hermanos	Bowl	1		Hermitage
LWD-PL-1-142	Belize	Solid Nubbin Foot	1		Spanish Lookout
LWD-PL-1-142	Belize	Body	4		Spanish Lookout
LWD-PL-1-142	Belize	Body	1	Platon Punctated	Spanish Lookout
LWD-PL-1-142	Belize	Ring Base	1		Spanish Lookout
LWD-PL-1-142	Cayo	Jar	13	Cayo Unslipped	Spanish Lookout
LWD-PL-1-142	Cayo	Jar	2	Cayo Unslipped	Spanish Lookout
LWD-PL-1-142	Garbutt Creek	Bowl	3		Spanish Lookout
LWD-PL-1-142	Garbutt Creek	Bowl	1		Spanish Lookout
LWD-PL-1-142	Dos Hermanos Red	Bowl	5		Hermitage
LWD-PL-1-142	Sotero Red-Brown	Bowl	3		Tiger Run
LWD-PL-1-142	Miseria	Censor Spike	1		
LWD-PL-1-145	Cayo	Jar	3	Cayo Unslipped	Spanish Lookout
LWD-PL-1-145	Chunhuitz	Dish	1	Benque Viejo Polychrome	Spanish Lookout
LWD-PL-1-145	Unknown	Hollow Flat Foot	1		Spanish Lookout
LWD-PL-1-145	Miseria	Censor Spike	1		
LWD-PL-1-145	Vaca Falls	Body	1	Roaring Creek	Spanish Lookout
LWD-PL-1-145	Belize	Dish	1	Platon Punctated	Spanish Lookout
LWD-PL-1-145	Dos Arroyos	Body	1		Hermitage
LWD-PL-1-143	Mount Maloney	Body	3		Spanish Lookout
LWD-Pl-1-143	Mount Maloney	Rim	30		Spanish Lookout
LWD-PL-1-143	Belize	Body	10		Spanish Lookout
LWD-PL-1-143	Belize	Ring Base	1		Spanish Lookout
LWD-PL-1-143	Belize	Flat Base	5		Spanish Lookout
LWD-PL-1-143	Belize	Bowl	1		Spanish Lookout
LWD-PL-1-143	Belize	Solid Nubbin Foot	1	Xunantunich Black on Orange	Spanish Lookout
LWD-PL-1-143	Chunhuitz	Body	1	Benque Viejo Polychrome	Spanish Lookout
LWD-PL-1-143	Cayo	Jar	18	Cayo Unslipped	Spanish Lookout
LWD-PL-1-143	Cayo	Jar Body	2	Cayo Unslipped	Spanish Lookout
LWD-PL-1-143	Dos Arroyos	Dish	2		Hermitage
LWD-PL-1-143	Dos Arroyos	Base	1		Hermitage
LWD-PL-1-143	Garbutt Creek	Bowl	2		Spanish Lookout
LWD-PL-1-143	Minanha Red	Dish	1		Hermitage
LWD-PL-1-143	Sotero Red-Brown	Bowl	2		Tiger Run
LWD-PL-1-143	Belize	Body	2		Spanish Lookout
LWD-PL-1-143	Belize	Dish	1		Spanish Lookout
LWD-PL-1-143	Belize	Bowl	1		Spanish Lookout
LWD-PL-1-143	Mount Maloney	Body	1		Spanish Lookout
LWD-PL-1-143	Cayo	Jar Body	3		Spanish Lookout
LWD-PL-1-143	Cayo	Jar Body	1	Cayo Unslipped	Spanish Lookout
LWD-PL-1-LT-1	Savannah Orange	Cacao Vessel	2		Jenny Creek

Table 5: Results of Lower Dover (Barton Ramie South) Ceramic Analysis.

Statistical Analyses

This research follows Ricketson's (1937) method of statistical analysis to estimate population density. The 2013-2014 settlement survey at Lower Dover (Barton Ramie South) recorded sixty house mounds. The sample area is 100% habitable and was assumed to be 100% habitable in antiquity. The sample area measures 2sq. kilometers.

60 house mounds X 5 people/house mound = 300

300 / 2km^2 = 150

150 – 75% (reduction) = 38 people/ sq. kilometer.

As mentioned earlier, there are numerous ways in which anthropologists can use statistics to derive an estimated population. Additionally, based on the discretion of the investigating anthropologist this equation could be manipulated to reflect a larger or smaller number of occupants per household.

For consistency in my analysis I did not stray from Ricketson's original estimates. It was used by Willey and his team to estimate population at Barton Ramie and most archaeologists have used some variation of this equation in their assessments along the Belize River Valley. For example, in her Baking Pot analysis Hoggarth (2012) uses 5.5 people per house mound. That said, the population density at Lower Dover (Barton Ramie South) is thirty-eight people per square kilometer, or seventy-six inhabitants.

As a comparison survey at Baking Pot has identified 554 house mounds (Hoggarth 2012). Applying the values in this equation, the population of Baking Pot is 2,770 inhabitants. Similarly, Willey recorded 262 house mounds at Barton Ramie.

Following this equation Willey estimated the population at Barton Ramie to be 2000 inhabitants.

Comparatively there is a dearth of house mounds at Lower Dover (Barton Ramie South). Only when the sum of house mounds identified at Lower Dover (Barton Ramie South) is added to the 262 house mounds identified by the Peabody's 1950's survey of Barton Ramie does the Lower Dover (Barton Ramie South) settlement density become comparable to the aforementioned sites. Interestingly, when combined Lower Dover (Barton Ramie South) and Barton Ramie comprise 322 house mounds with an estimated population of 2,076 inhabitants. This is based on a ratio of five people per mound, within the current survey boundaries, following the population estimates at Barton Ramie (Willey 1965), Baking Pot (Hoggarth 2012:54), or Uaxactún (Ricketson 1937:15,16).

IV. DISCUSSION

There are numerous factors that can affect the amount of observable ancient settlements today, such as, contemporary agriculture, pasture land, economic development, natural degradation, scope of survey, and indeed the skill of the surveyor. In the course of this research it became apparent that the periphery of Lower Dover (Barton Ramie South) was no exception to these principles and as such, was certainly not unscathed by the passage of time.

Today there is a lot of pastureland in the area therefore it is not uncommon for people make troughs and barriers for livestock. Additionally, there is an abundance of limestone outcroppings in the area especially to the south where identifying a single house mound can be very difficult whether by LiDAR or pedestrian survey. Moreover, the area was used by the British Army for gunnery and artillery practice as evidenced by foxholes, and other entrenchments that appear as mounds but when subsequently 'ground truthed' proved incorrect.

Like Barton Ramie there are three 'double' mounds and one plazuela group near the terracing. At that point it is practically in the foothills of the Maya Mountains where the settlement density plateaus. Further, the steep slopes and consequent lack of nutrient rich soil ideal for agriculture seem self-defeating for a community of agrarian based villagers. Of course, with the exception of terracing, which I had fully anticipated discovering in this particular area at the onset of this research given the amazing results LiDAR analysis yielded at the site of Caracol (Chase *et al*. 2011). However, LiDAR and pedestrian survey failed to provide evidence for this in the hillsides.

Interestingly, there are many mounds that utilize the rocky outcroppings resulting in house platforms that seem to consist of only half of a platform with the other half being a modification of the bedrock. There is one group in the settlement consisting of five structures. While LiDAR identified 50 additional mounds, after investigation only 20 could be verified. Bringing the total sum of mounds in the Lower Dover settlement to 60 and the population density estimated to be 38 people/km^2. As previously stated, although site preservation, intensity, and scope of survey can certainly affect this data, this is an unignorably contrasting pattern than is observed at neighboring sites.

For example, survey at Baking Pot to the immediate west, has identified 554 house mounds (Hoggarth 2012: 55). Although it should be noted that the survey boundaries were delineated to cover a much greater expanse ($9km^2$) the population here is 230 people/km^2. Meanwhile, since 1991 ongoing survey further west at Cahal Pech has identified 158 house mounds thus far (Ebert *et al.* 2015), and that is despite the fact that the majority of that sites settlement zone lies beneath one of the largest and arguably fastest developing cities in the entire country of Belize. When these observations are coupled with the dearth of house mounds at Lower Dover, the lack of any identifiable administrative center at Barton Ramie, and the two sites proximity to each other, it highlights an intriguing dilemma.

There does not seem to be a substantial settlement at Lower Dover (Barton Ramie South) when compared to surrounding sites. Unlike Baking Pot and Barton Ramie there is no current evidence for Post Classic occupation from the mounds shovel tested or on the surface of mounds in the Lower Dover (Barton Ramie South) settlement. In light of this it should be again noted that there are stark contrasts between past realities and

modern perceptions. The Belize River separating Barton Ramie and Lower Dover (Barton Ramie South) should not be viewed as a boundary, but rather as a focal point. In modern society rivers are commonly used as natural boundaries dividing spaces. For example, the Delaware River in the northeastern United States is a natural boundary separating Pennsylvania from New Jersey, similarly the Hudson River separates New Jersey from New York.

However, in the case of Barton Ramie and Lower Dover (Barton Ramie South), the Belize River provided for the many necessities of ancient life. The river was used as a highway to facilitate trade, water was drawn from the river, clay was gathered at its banks to manufacture the ceramics used in every capacity of life, and the river would also have been a source of fish, turtle, and shellfish (Willey 1965:573).

An ancient Mesoamerican example can be drawn from the Rio San Juan which runs through the heart of Teotihuacán, Mexico. In fact, they re-channeled several of the local streams forming the Rio San Juan thus creating a river that did not previously exist. The Rio San Juan cuts directly across the "*Calzada de los Muertos"* or "Avenue of the Dead", the center piece and focal point of the city. The avenue was a femoral passage in the city which showcased the power of Teotihuacán by connecting the Pyramid of the Sun and the Moon Pyramid which mimicked the silhouette of the sacred mountain Cerro Gordo.

The Teotihuacaños were capable of numerous feats of engineering and could easily have diverted a river or stream, instead they deliberately chose to have a river run directly through the city, not as a boundary but rather as a focal point. It is with this example that I suggest Lower Dover is actually the southern portion of Barton Ramie,

hence my reasoning for referring to the site as Barton Ramie South. This is especially likely in an area otherwise devoid of lakes or cenotes.

However, while this research has answered some questions regarding Lower Dover (Barton Ramie South), many questions remain. Further research is certainly warranted at this site. Future research should include systematic vertical excavation within the settlement zone. Only deep vertical excavations will accomplish the task of establishing an occupational timeline at Lower Dover (Barton Ramie South) in both the settlement and site core.

It should again be noted that the excavations for this thesis were conducted in only one area. While this area has evidence of Preclassic occupation, it should not be taken to implicitly suggest that the entirety of the settlement area dates to this time period.

Research in the Lower Dover (Barton Ramie South) site core is currently ongoing. If future research in the Lower Dover (Barton Ramie South) ceremonial center does not provide evidence of a larger Preclassic presence, then the Lower Dover (Barton Ramie South) settlement is older than the ceremonial center. This is given that the area as rich in alluvial soil as it is, on the banks of the Belize River, is just meters away from a long-standing and established community such as Barton Ramie making it unlikely that it could be occupied by any other group in this later time period.

As stated, there is still much to do in both the site core and the periphery. Likewise, investigations in the site core have really just begun. However, there are two hypotheses that can be made in regard to Lower Dover (Barton Ramie South).

If future investigation in the site core reveals that most of the site experienced few earlier construction phases it may be a very similar situation to what was found during 1993 excavations at the Ontario site by the B.V.A.P project (Garber *et al.* 2004). The site of Ontario is located in Ontario village 13km west of Belize's capital Belmopan.

Ontario is unique, in that, it is a small site, and features an unusually lower settlement density than similarly sized sites. Moreover, investigations suggest that the site was likely only occupied for a short amount of time (250 years) with all construction phases confined to the Late Classic (Garber *et al.* 2004:300). However despite this, the site features a ballcourt. During the Peabody investigations of the Belize River Valley, Bullard noted that the absence or presence of a ballcourt was a critical feature in differentiating minor centers from major centers (Bullard 1960:360).

Ballcourts are highly visible and powerful locations that serve to represent ideology and ritual in Mesoamerican life (Friedel *et al*. 1993; Schele and Miller 1986). In fact, iconographic studies, stories within the Popol Vuh, ballcourts are suggested to have been the focal point concerning rites of war, sacrifice, and cosmology (Garber *et al*. 2004). In particular, the Mixtec codices document the ballcourt as having been used in the preparation of war as well as being crucial areas in maintaining alliances (Koontz 1994).

Garber surmises that the minor center of Ontario could have served specialized functions related to boundary maintenance, having been established in the Late Classic in an empty "buffer zone" between Blackman Eddy and Camelote. There is a large eastern shrine present at Ontario. Garber contends that this shrine is a "feature typically related to

ancestor related concepts and ritual that may have provided the prestige and legitimation necessary for its intermediary role" (Garber et al. 2004:302).

Moreover, the presence of a ballcourt, a feature typically associated with larger sites, would have "provided the appropriate social contexts for marking of the proposed district boundaries" (Garber *et al*. 2004:302). Especially as "rituals associated with the ballgame are related to prestige, alliance maintenance, and warfare" (Garber *et al.* 2004:302).

This is particularly interesting because while the presence of empty "buffer zones" have been noted by previously in various theoretical models (Garber et al. 2004), aside from Ontario there are none present in the Belize Valley. If future research at the site of Lower Dover (Barton Ramie South) illustrates similar patterns, it would certainly add to our understanding of the existence of these boundary markers in the Belize Valley, while bolstering our understanding of the sociopolitical function of minor centers (Garber *et al.* 2004).

However, there is also the possibility that future research within the site core will reveal that Lower Dover (Barton Ramie South) had a long occupation. The architectural attributes of Group 1 in the settlement seem to be consistent with plazas typically associated within ceremonial centers. If it is the case that the eastern half of the site was bulldozed, as the current property owners attest, and this part of the site was spared from this destructive event, perhaps the plaza is a continuation of the site core. Thus, the presence of Middle Preclassic ceramics make Lower Dover (Barton Ramie South) significantly older than is currently postulated. Moreover, the presence of this ceramic chronology would make the occupational history of Lower Dover (Barton Ramie South)

consistent with Barton Ramie. If this is in fact the case, then this hypothesis would likely contradict the previously postulated theory that Blackman Eddy served as the administrative center of Barton Ramie until its abandonment.

In either scenario, current research suggests that it is very likely that Lower Dover (Barton Ramie South) and Barton Ramie are in fact the same archaeological settlement. Currently, what can be gleaned from research in the Lower Dover (Barton Ramie South) site core is based on excavations focused in Plaza F and Plaza G. These particular plazas within the site core show evidence of three phases of construction. Ceramic analysis thus far suggests that the Lower Dover (Barton Ramie South) site core has been occupied since at least the Early Classic Period with no evidence of prior occupation (Guerra et al. 2015).

V. CONCLUSION

At the onset of this survey it was postulated that given Lower Dover's (Barton Ramie South) proximity to Barton Ramie and the latter sites absence of a site core, Lower Dover (Barton Ramie South) might indeed be the ceremonial center of Barton Ramie. Further research must be conducted, as this cannot be proven until a chronology of the Lower Dover site core is revealed. Moreover, this interpretation and the supporting evidence are compatible with what we understand about Maya settlement patterns in the Lowlands and more specifically the Belize River Valley 'ribbon strip'.

Earlier work at the Blackman Eddie site conducted by B.V.A.P noted that because of its "proximity to Barton Ramie, in all likelihood Blackman Eddy served as the administrative center of Barton Ramie" (Garber *et al.* 2004:67). This conclusion was largely based on the principle that Blackman Eddy was the closest site, approximately 2km from Barton Ramie. Armed with this revelation, the absence of an administrative center at Barton Ramie, and a ceramic chronology consistent with the Barton Ramie settlement zone up until the Late Classic (Garber et al. 2004: 67) it most certainly seemed undeniably likely.

However, at the time of the B.V.A.P investigations Lower Dover (Barton Ramie South) was still not archaeologically investigated. Garber could not have realized the extent of Lower Dover (Barton Ramie South) at the time and unfortunately, as a result, it went unnoticed that Lower Dover (Barton Ramie South) actually occupied a place that was in much closer proximity to Barton Ramie.

Likewise, Gordon Willey did not recognize Lower Dover (Barton Ramie South) as a substantial site or if he did these administrative centers were simply not the focus of his research at the time. So, was Willey aware of the existence of Lower Dover or, Barton Ramie South? We may never know for certain.

However, Mr. Hill, the excavation foreman the team hired, explained to my surprise that Willey was according to him, aware of the site (D. Hill, personal communication, August 4, 2014). Mr. Hill elaborated further that he had personally driven Willey to the site. Not surprisingly, most of the local workers knew of the presence of what is now called Lower Dover. Their children played among the ruins in the jungle as their parents had done when they were children.

This is not to say that Willey blatantly ignored the site, rather it was likely a combination of the dense foliage surrounding the site, which can hinder the identification of even the largest pyramidal structure, and likely some skepticism that the foreman having no previous archaeological background knew what he was trying to show Willey.

However it does bring to the forefront an interesting question about the archaeological methodology that Willey helped to spur and has been perpetuated since. "While settlement archaeology has contributed new insights into Maya archaeology. Recent work contrasts the "site," meaning the center and the elite, with "settlement," meaning outside the core with households and the non-elite (Ashmore 2003: 9 from Weller 2009)".

While he opened the door to the study of ancient settlements challenging the methodology of his era that focused on elite residences, it is a balance of these two

entities we now understand to be ideal. If we are to understand a culture of the past we cannot treat settlements and their urban centers as separate thus creating a false dichotomy (Ianonne and Connell 2003:13). In studying the lives of the everyday people, we must take into consideration how the elite and ruling classes interacted with the commoners and vice versa. It is in this interaction that everyday life happens. Perhaps one way to overcome this dichotomy is emphasizing a focus on community archaeology (Weller 2009, Yaeger and Canuto 2000).

Included in the edited volume "The Ancient Maya of the Belize River Valley: Half a Century of Archaeological Research" (Garber *et al.* 2004) there is a chapter written by Willey. In his "Retrospective" Willey goes into incredible detail of the logistical aspects of conducting archaeological work in Central America at that time. His writing is jovial and seems to imply he remembered his work in British Honduras (Present day Belize) fondly and vividly.

It took 60 years for archaeological investigations in the immediate area to include Lower Dover. It is my sincerest hope that Lower Dover (Barton Ramie South) and Barton Ramie can finally be included in scholarly debates regarding the ancient Maya political dynamics in the region. I have the utmost confidence that the current ongoing investigations in the site core will add more evidence for the inclusion of Lower Dover (Barton Ramie South) in such debates. This thesis sought to discover if Lower Dover (Barton Ramie South) and Barton Ramie were in fact the same site. It is my hope that this research has contributed to answering this question while paving the way for further research.

Finally, recounting a cautionary paragraph from his 1965 publication Willey stated of his survey "…this probably should not be taken to mean that the hills and hillsides were unsuited to residence for if we had extended our survey several kilometers north or south of the Belize Valley we might have come upon clusters of house mounds in the hill terrain" (Willey et al. 1965:581). It is compelling to think how he could have increased our understanding of this and eliminated this false dichotomy many years earlier had he and his team gone further south of the River and incorporated Lower Dover thus, extending our boundaries.

REFERENCES

Awe, Jaime J., Claire E. Ebert, Julie A Hoggarth.
2015 Three Katuns of Pioneering Maya Settlement Research: Preliminary Results of Lidar Survey in the Belize River Valley. Paper in review for Breaking Barriers: Proceedings of the 47th Annual Chacmool Conference, Calgary, 2014.

Bullard, William R.
1960 Maya Settlement Pattern in Northeastern Péten. Guatemala. American Antiquity 25:355-372.

Bullard, William R., Mary Ricketson-Bullard
1965 Late classic finds at Baking Pot, British Honduras. Art and Archaeology Occasional Papers, No. 8. Toronto: University of Toronto Press.

Canuto, Marcello A., Jason Yaeger
2000 The Archaeology of Communities: A New World Perspective. Edited Volume. Routledge, New York, NY.

Castelhano, Bruno, Philip Reeder
1996 Tres Rios Geological Survey. Unpublished M.A. Thesis Proposal. University of Nebraska at Omaha.

Chase, Arlen F., Diane Z. Chase, John F. Weishampel, Jason B. Drake, Ramesh L. Shrestha, K. Clint Slatton, Jaime J. Awe, William E. Carter
2011 Airborne LiDAR, archaeology, and the ancient Maya landscape at Caracol, Belize. Journal of Archaeological Science 38 pp. 387-398.

Demarest, Arthur
2004 The Ancient Maya: The Rise and Fall of a Rainforest Civilization. Cambridge University Press, Cambridge, MA.

Ebert, Claire E., Jaime J Awe
2015 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2014 Field Season Vol. 20, pp.138-166. Institute of Archaeology, Belmopan, Belize, C.A.

Eliade, Mircea
2004 Shamanism: Archaic Techniques of Ecstasy. Princeton University Press New Ed edition. Princeton, NJ.

Freidel, David A. Linda Schele, Joy Parker
1993 Maya Cosmos: Three Thousand Years on the Shaman's Path. Harper Collins Publishers Inc. New York, NY.

Garber, James F.
2004 The Ancient Maya of the Belize River Valley: Half a Century of Archaeological Research. Edited Volume. University of Florida Press.

1989 Archaeology at Cerros, Belize, Central America, Volume II, The Artifacts. Southern Methodist University Press; Revised edition.

Gifford, James C.
1976 Prehistoric Pottery Analysis and the ceramics of Barton Ramie in the Belize Valley. Harvard University Press. Cambridge, MA.

Goyer, G. G., R. Watson.
1963 The Laser and its Application to Meteorology. Bulletin of the American Meteorological Society. 44 (9): 564–575.

Guerra, Rafael, Shawn Morton, Marieka Arksey, Jaime J. Awe
2012 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2011 Field Season Vol. 17 pp. 105-120. Institute of Archaeology, Belmopan, Belize, C.A.

Guerra, Rafael, Michael Louis Petrozza, Rebecca Pollett, Jaime J. Awe
2013 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2012 Field Season Vol.18, pp. 210-233. Institute of Archaeology, Belmopan, Belize, C.A.

Guerra, Rafael, Renee Collins, Jaime J Awe
2015 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2014 Field Season Vol. 20, pp.1-17. Institute of Archaeology, Belmopan, Belize, C.A.

Headrick, Annabeth
2007 The Teotihuacan Trinity: The Sociopolitical Structure of an Ancient Mesoamerican City. University of Texas Press. Austin, TX.

Helmke, Christophe, Jaime J. Awe
2005 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2013 Field Season Vol.19, pp.193-201. Institute of Archaeology, Belmopan, Belize, C.A.

Helmke, Christophe, Jaime J. Awe
2012 Ancient Maya Territorial Organization of Central Belize: Confluence of Archaeological and Epigraphic Data. Contributions in New World Archaeology 4:59-90.

Hoggarth, Julie A.
2012 Social Reorganization and Household Adaptation in the Aftermath of Collapse at Baking Pot, Belize. Ph.D. Dissertation, University of Pittsburgh.

Iononne, Gyles, Samuel V. Connell
2003 Perspectives on ancient Maya rural complexity. Los Angeles: Cotsen Institute of Archaeology, University of California, Los Angeles, CA.

Kerr, Justin
1989 The Maya Vase Book: A Corpus of Rollout Photographs of Maya Vases, Volume 1. New York: Kerr Associates.

1990 The Maya Vase Book: A Corpus of Rollout Photographs of Maya Vases, Volume 2. New York: Kerr Associates.

1992 The Maya Vase Book: A Corpus of Rollout Photographs of Maya Vases, Volume 3. New York: Kerr Associates.

1997 The Maya Vase Book: A Corpus of Rollout Photographs of Maya Vases, Volume 5. New York: Kerr Associates.

Koontz, R.A.
1994 The Iconography of El Tajin, Veracruz, Mexico. Ph.D. Dissertation, University of Texas at Austin.

Masson, Marilyn A., David A. Freidel
2002 Ancient Maya Political Economies. Rowman Altamira Press.

Perkins, Carrie, Jaime J. Awe
2014 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2013 Field Season Vol.18, pp.201-212. Institute of Archaeology, Belmopan Belize, C.A.

Petrozza, Michael Louis, Jaime J Awe
2014 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2013 Field Season Vol.19, pp.193-201. Institute of Archaeology, Belmopan, Belize, C.A.

Petrozza, Michael Louis, Michael Biggie, Jaime J. Awe
2015 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2014 Field Season Vol.20, pp. 22-34. Institute of Archaeology, Belmopan, Belize C.A.

Renfrew, Colin, Paul Bahn
2012 Archaeology: Theories, Methods, and Practice. 6th Ed. Thames & Hudson New York, NY.

Ricketson, Oliver, G.
1931 Excavations at Baking Pot, British Honduras. In Contributions to American Archaeology, Vol 1, No. 1, pp. 1-28. Washington, D.C: Carnegie Institute of Washington.

Ricketson, Oliver, G., E.B. Ricketson
1937 Uaxactún, Guatemala. Group E-1926-1931. *Carnegie Institution of Washington*, Publication no. 477. Washington D.C.

Schele, Linda, Mary Ellen Miller
1986 The Blood of Kings: Dynasty and Ritual in Maya Art. George Braziller Inc.

Villacorta, J. Antonio, Carlos Villacorta
1930 Códices Mayas. Tipografía Nacional, Guatemala.

Weller, Errin Teresa
2009 Changing perspectives on community identity and function: A remote sensing and artifactual re-analysis of Barton Ramie, Belize. Ph.D. Dissertation, University of Colorado Boulder.

Wilkinson, Patrick, Molly Hude, Jaime J. Awe
2011 The Belize Valley Archaeological Reconnaissance Project: A Report of the 2010 Field Season Vol.16 pp. 7-15. Institute of Archaeology, Belmopan, Belize, C.A.

Willey, Gordon, William R. Bullard Jr., John B. Glass, James Gifford
1965 Prehistoric Maya Settlements in the Belize Valley. Papers of the Peabody Museum of Archaeology and Ethnology. Harvard University Vol. LIV. Peabody Museum Cambridge, MA.

Willey, Gordon
1953 Prehistoric Settlement Patterns in the Virú Valley, Perú. Smithsonian Institution Bureau of American Ethnography Bulletin 155. United States Government Printing Office. Washington, D.C.

Yaeger, Jason
2005 Revisiting the Xunantunich Palace: The 2003 Excavations. Foundation for the Advancement of Mesoamerican Studies, Inc. famsi.org