CHERT TOOL PRODUCTION AND EXCHANGE AT TWO LATE POSTCLASSIC COASTAL MAYA HOUSEHOLDS

by:

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ABSTRACT

Chert tool production and exchange has long been studied for the Maya Preclassic to Terminal Classic Periods of Northern Belize (1000 B.C.-A.D. 950). It is increasingly clear that lithic systems of production and exchange were an integral part of the economic environment for this region, yet lithic research pertaining to the Maya Postclassic Period (A.D. 950-1530) is not well represented in the general literature. A recent examination of 110 chert, chalcedony, and obsidian small side-notched projectile points and point preforms, as well as 2,163 pieces of associated production debitage from two Late Postclassic households at Santa Rita Corozal, Belize, has yielded the identification of two lithic craft production areas. Examination of the complete lithic collection from these residences, as well as an additional 176 projectile points located throughout the site, reveals the need for new models of lithic production and exchange for this region during the Postclassic Period.

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CHAPTER 1: INTRODUCTION

The Postclassic Period (A.D. 950-1530) site of Santa Rita Corozal, located in Coastal Northern Belize, was situated in a region noted for its maritime trade (Sabloff and Rathje 1975; Masson and Freidel 2002; D. Chase 1982; D. Chase and A. Chase 1986). The production, exchange and consumption of lithic tools would have been a key component to the economic system of this region, as such goods are highly integrated with surplus craft production activities (D. Chase and A. Chase 2014; Martindale Johnson 2014; see Barrett 2011). Lithic studies undertaken during the Late Postclassic Period (A.D. 1200-1530) have primarily focused on non-siliceous artifacts such as obsidian, basalt, and granite, with chalcedony being a notable exception. Chert studies have been investigated for the Early Postclassic Period at Colha (see Hester 1985), and for the Postclassic Period at Mayapan in the Yucatan (see Paling 2007); yet flaked stone analysis of the Late Postclassic Period of Northern Belize has been less studied (but see Masson 2000). This is a pattern not typical of earlier periods for this region, where chert tool production and exchange are more frequently discussed. Examination of the complete Postclassic Period Santa Rita lithic collection recovered by Dr. Diane Chase and Dr. Arlen Chase of the Corozal Postclassic Project (1979-1985) has yielded a formal toolset of 286 chert, chalcedony, and obsidian projectile points and point preforms. Analysis of this formal toolset, as well as the associated manufacturing debitage, has led to the identification of two household crafting areas in which surplus production of these formal tools occurred. This thesis seeks to position Late Postclassic Period lithic production and consumption in relation to earlier economic practices through the analysis of these two Late Postclassic Period lithic workshops.

Chert studies undertaken in Northern Belize have typically focused on the Preclassic and Classic Periods of Maya prehistory (B.C. 1000- A.D. 950) with the Postclassic Period being less an investigative focus. Investigations at the site of Santa Rita Corozal have contributed to the understanding of these earlier periods. A portion of the Santa Rita lithic collection was previously analyzed by Dockall and Shafer (1993) for the purpose of understanding the intensity of Maya lithic production, consumption, and exchange in Northern Belize for the Late Preclassic Period (BC 300-AD 200). The results from this study, as well as data garnered from sites in proximity to Santa Rita Corozal, generated a model that was subsequently applied to later periods for this same region, specifically the Classic (A.D. 250-950) and Postclassic Periods (Santone 2009; Shafer and Hester 1988). This model is known as the "producer-consumer" model of Northern Belize and has been well tested for the Preclassic and Classic Periods (Barret et al. 2011; McSwain 1990). Lithic studies of Postclassic Northern Belize, however, have not been directed towards such a model.

The main tenets of the producer-consumer model focus on the exchange networks between Northern Belizean centers and the producer site of Colha (Santone 2009). It is believed that Colha was exporting finished formal tools produced on locally available Northern Belizean Colha-like cherts. These cherts occur in proximity to the site of Colha, and it is believed that the occupants of the city quarried this resource. This chert has proven to be traceable to the Colha area of Northern Belize through both visual sourcing methods and Neutron Activation Analysis (Cackler et al. 1999a; Cackler et al. 1999b; Meadows 2001). The tool forms produced on these materials are also believed to be indicative of distinctive technological production patterns traceable to Colha manufacturers (Barrett et al. 2011: 20). Colha, however, was abandoned around AD 1250 during the later part of the Early Postclassic Period (Shafer 1985; Hester 1985). Therefore, models of production and exchange need to be analyzed for the Late Postclassic Period, and yet literature pertaining to this timespan is scarce.

New strategies of formal stone tool production should be considered for the Postclassic Period of Northern Belize to assess material variability, as well as production practices. Previous models suggest production occurring on distinct minerals stemming from the Rancho-Creek chert beds surrounding Colha (Chiarulli 2012: 96). With the absence of a Colha production sphere in the Late Postclassic Period, however, new materials must have been incorporated into tool manufacture at other locations.

Additionally, previous models set in earlier time periods suggest that production occurred outside of consumer site centers. Current research at other Postclassic sites suggest surplus craft activities occurred at locations not previously identified as production loci of lithic goods (Masson 2000; 2002). New analysis from Santa Rita Corozal yields evidence that support formal tool production occurring onsite during the Late Postclassic Period. Additionally, tool production occurred on local and non-local cherts, as well as chalcedony and obsidian. Again, this is a pattern not typical of earlier periods.

Problem

This thesis seeks to position Late Postclassic lithic production and consumption in relation to earlier economic practices through analyzing two Late Postclassic lithic workshops. If a traditional model continues, there will be little variation in source materials as most lithics would have been imported as finished products into consumer sites. However, the presence of workshop areas in Late Postclassic Santa Rita Corozal suggests issues with the Classic Period model and that further analysis may help to better define the study of the Late Postclassic Period.

Thus, this thesis will ascertain household craft production practices relative to lithics at Postclassic Santa Rita Corozal through the analysis of two workshop areas. As the presence of craft production is explicitly evidenced by a workshop locus, it is first necessary to define a workshop. This paper delineates a lithic workshop by the presence of production related debris, preforms, and finished tool forms. Therefore, if the presence of a full reduction sequence is noted for a location, a workshop can be identified for that location.

Second, this paper seeks to examine the broader relationships of lithic exchange between Santa Rita Corozal and other sites throughout Northern Belize. Consequently, a second outcome is to assess production related material for diversity of source materials. Past literature has shown that earlier phases in Maya history have characteristically been identified as using few chert resources and this inference can be tested for Postclassic Santa Rita. Hence, if Classic Period patterns were followed, source material variation will be minimal and Colha-like Northern Belize Cherts will be the predominate material in any Postclassic lithic assemblage. Thus, a model of production and consumption similar to previous models can be acknowledged if few materials are used to produce these tool forms. If instead, there is great variability in source materials, then a more dynamic exchange system for Santa Rita Corozal can be identified, one in which multiple economies were involved.

CHAPTER 2: BACKGROUND

Postclassic Santa Rita Corozal

The Maya site of Santa Rita Corozal, located along Chetumal Bay in Northern Belize, had an occupational history spanning all phases of Maya prehistory (D. Chase 1986). However the site is primarily known for its Postclassic Period occupation (D. Chase 1981; 1982; Shafer and Hester 1988; Jaeger 1988). The study of Postclassic Period Santa Rita Corozal helped dispel common misconceptions that the Maya were a "decadent" population in comparison to earlier Classic Period Maya (D. Chase 1990: 207). Instead, four field and two lab seasons at Santa Rita Corozal provide a substantial archaeological dataset in which to assess previous interpretations (D. Chase 1986: 347; 2004). Contrary to traditional views of the Maya Postclassic Period, research at Santa Rita Corozal showed that 'vacant terrain' did not always correlate with a decline in social and political organization (D. Chase 1986), population density (D. Chase 1990), or the use of organized ritual in Maya religious practices (D. Chase 1991; 2004; 2008).

Additionally, the extent of the regional interaction spheres in which the Postclassic Maya participated was also examined (see D. Chase and A. Chase 1989), and research at Santa Rita Corozal supported an argument stating that the Maya had transitioned into a new culture based on 'mercantilism' (Sabloff and Rathje 1975; D. Chase 1982). This model claimed that, during the Postclassic Period of Northern Belize, less energy was invested in statements of power, such as monumental architecture and stela erection, but instead was exhibited in broader statements of intraregional interaction and exchange (Sabloff and Rathje 1975; Freidel and Sabloff 1984).

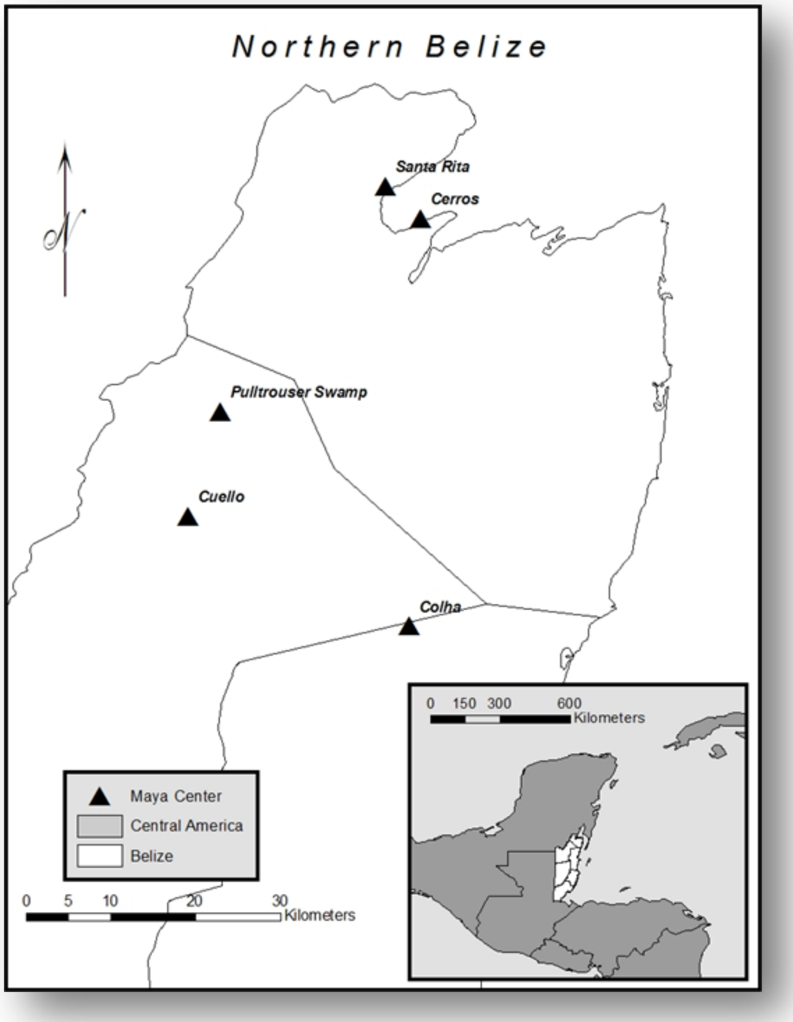

Figure 1: Northern Belize-Santa Rita Corozal and Other Sites Discussed

Production and exchange was an integral part of the Coastal Maya economy, and is illustrated by both ethnohistoric (Tozzer 1941) and archaeological evidence (McKillop 2005; Speal 1997). Goods exchanged included such foodstuffs as cacao (McAnany et al 2002; A. Chase 1981:32; D. Chase 1986; D. Chase and A. Chase 1989: 29), salt (McKillop 2005; Andrews and Mock 2002), honey (D. Chase and A. Chase 1989: 29), and seafoods (McKillop

2007; Cunningham-Smith et al. 2014). Other natural resources, such as marine goods (McKillop 2007) and crafted shell items (Masson 2002: 342) also contributed to the Postclassic economy. Circulation of these goods occurred via waterborne routes to coastal and inland markets which lined the Yucatan and Belizean Coasts. This seaborne and inland riverine trade began earlier (Cunningham-Smith et al. 2014: 43; McKillop 2005: 5631) and extended into the Postclassic Period as well (Sabloff and Rathje 1975; Sabloff and Freidel 1984: 185-192).

Lithic data further supports arguments for exchange. Obsidian prismatic blades from Guatemala and Mexico have been recovered throughout Postclassic Northern Belize (Nievens 1983), including Santa Rita Corozal (D. Chase 1981: 32). Other non-local metamorphic stones such as basalt and granite are frequently found in site assemblages (Jaeger 1988; Duffy 2011: 22). Locally mined chalcedonies were often exploited and have been documented in the assemblages of other sites in the Northern Belize region during this period (Masson 2000). Thus, exchange of non-chert resources is well documented for this region.

Chert tool assemblages played a key role in establishing production and exchange economies in Northern Belize during the Preclassic Period (Dockall and Shafer 1993; McAnany 1989). These ‘producer-consumer’ models were established for Northern Belize based on an exchange economy of formal chert tools at the site of Colha with other sites throughout Northern Belize (Hester 1985; Santone 2009). It is interesting, therefore, that the production and exchange of formal chert tools has not been fully analyzed for this area during the Postclassic Period. That Postclassic Northern Belize was interlocked in a system of trade and exchange has been well documented, both in ethnohistoric accounts and in the archaeological record (D. Chase 1981; see Masson and Freidel 2002).

Maya Exchange: Economic Models

Traditionally, the economic models which have been used to describe the movement of local and regional items in pre-modern states have centered on redistribution and were largely constructed on the substantivist narratives of Karl Polyani (Feinman and Garraty 2010: 169; Blanton and Fargher 2010: 209). Redistributive exchange focuses on mechanisms of reciprocity to explain the movement of goods and services throughout a region, often attributed to 'big-man' gift giving or feasting, and further indicative of South Pacific and Northwest Coast chiefdom societies (e.g. Webster 1998, critiqued in D. Chase and A. Chase 2014: 239).

It is easy to conceive why models of redistribution were applied to Maya exchange practices, as traditionally epigraphic evidence instead of population densities in Maya polities were incorporated when discussing the political organization of site centers (A. Chase and D. Chase 2003: 108; Marcus 1995: 13). Thus, Maya society was often scaled at the chiefdom unit of social complexity (Braswell 2010: 138; West 2002: 143). Indeed, population growth and urbanization are considered to be casual factors of market exchange systems (Blanton and Fargher 2010: 213), and the population size of several Lowland sites simply do not fit into chiefdom-like social and economic organizational categories (see Braswell 2010: 138; Masson and Freidel 2012: 457; A. Chase and D. Chase 2003). Thus, redistributive exchange may describe Preclassic Maya economic systems, but not all Classic Period and Postclassic Period exchange systems (A. Chase and D. Chase 2003: 117; Braswell 2010: 138). Therefore, identifying certain Classic Period and Postclassic Period Maya economic organizations based solely on redistributive exchange is inappropriate.

Additionally, as stated by Dahlin and Ardren (2002: 250) previous models have proposed that market exchange was not utilized due to the self-sufficiency and sustainability of the ancient Maya at the household level. Contrary to this assessment, recent research has demonstrated that several Classic and Postclassic Period urban centers were embedded in market systems which supplied households with local and regional goods critical to their survival (Masson and Freidel 2012). Most notably, Classic Period sites such as Caracol and Tikal in the Maya Heartland, as well as Chunchucmil from the Yucatan have been identified as requiring non-redistributive exchange mechanisms to provision household residents of certain essential goods (A. Chase 1998; D. Chase and A. Chase 2014; Masson and Freidel 2012; Dahlin and Ardren 2002).

To demonstrate, settlement at the site of Caracol, Belize, is known to have occupied over 170 square kilometers (A. Chase and D. Chase 2004:117). Terraced agricultural fields supported a population of over 100,000 residents who were in many cases embedded in an agricultural landscape which encompassed 160 square kilometers of farmland (A. Chase et al. 2011: 389; A. Chase 2014a: 214; A. Chase et al. 2014b). While many of the site's rural residential groups had immediate access to farmland, others were situated in a more urban environment, necessitating other means to generate food and wealth (Chase et al. 2001; Martindale-Johnson 2014: 91). Surplus production of goods through multicrafting has recently proven to be that means for much of Caracol's population (A. Chase and D. Chase 1994; D. Chase and A. Chase 2014: 247; Martindale Johnson 2014: 91; Martindale Johnson 2008).

Terminal Classic Period Tikal demonstrates a similar reliance on local markets to circulate regionally acquired goods. Masson and Freidel (2012: 455) note that household samples demonstrating between 20-50% of non-locally produced goods are indicative of market-based exchange. Foreign ceramics are represented in both commoner and elite household contexts at Tikal ubiquitously (Masson and Freidel 2012: 464). Obsidian, marine shell, foreign ceramics, and other non-local goods recovered from all contexts at Tikal occur in frequencies which suggest that local household economies could not provision themselves without an available market in which to procure these goods (Masson and Freidel 2012). While not often discussed, the nature of ceramic production itself meant that ceramics are usually produced away from urban environments to cut down on by-products of firing, such as smoke and ash (A. Chase and D. Chase 2015).

Additionally, not all Maya polities were located in areas of rich agricultural resources so that households could completely provision themselves. At Classic Period Chunchucmil, for example, maize was believed to be the staple food based on the ubiquitous distributions of manos and metates throughout the site (Dahlin and Ardren 2002: 261). However, maize agricultural production was sparse in this region due to poor soil quality and low precipitation (Rohrer 2012: 19; Dahlin and Ardren 2002: 262). In these instances, other resources would have to be exchanged to obtain both maize and metamorphic stone used in food preparation. As stated in Dahlin and Ardren (2002: 252) at Chunchucmil this was accomplished through an active participation in overland and seaborne trade routes as an exchange node between coastal and inland zones; Chunchucmil was also a participant in the lucrative coastal salt trade. Thus, self-provisioning models often attributed to Maya polities are sometimes too simplistic in describing large urbanized Maya environments.

Despite the evidence to support market exchange in the Maya Lowlands, it had proven difficult to identify the physical locations of exchange in the archaeological record until recent methodological advancements (Hirth 1998; Minc 2006; D. Chase and A. Chase 2014; Dahlin et al. 2007). Current methodology focuses on the distributional approach to identify marketplace exchange (Hirth 1998) and on soil analysis to identify markets (D. Chase and A. Chase 2014; Dahlin et al. 2010). Other methods, such as the contextual approach, configurational approach, and spatial approach have often been used (see D. Chase and A. Chase 2014), but are less employed.

As explained by Hirth (1998), a physical location representing a marketplace would be identified using a configurational approach. This method seeks to ascertain the presence of a marketplace through identification of architectural space resembling a marketplace. Traditionally, marketplaces have been identified using ethnohistoric descriptions of market locations, which are typically identified as large open plazas with range buildings lining open spaces (Hirth 1998: 453). Additionally, other infrastructure used in identification, such as proximity to main transportation arteries and sacbeob, have been employed in marketplace identification. Centralized road systems and termini nodes with large open plazas lined by range buildings at Terminal Classic Caracol are examples of configurational evidence to identify a market location (D. Chase and A. Chase 2014: 240). Other infrastructure, such as warehouses or port facilities used in the storage of goods, can be used to identify market exchange (Smith 2004: 90). An example of this is evident at Postclassic Cozumel (Sabloff and Freidel 1984: 185-192).

A contextual analysis of market exchange focuses on indirect evidence to ascertain market identification. This approach uses inferred factors such as population size, urbanization, intensified agriculture and craft specialization as evidence of local market economies (Hirth 1998: 453; Blanton and Fargher 2010: 213). Contextual analysis of market exchange is evidenced at Caracol, Belize, where population growth during the Late Classic Period was some of the highest in the Maya region (Chase and Chase 2004). The population of Caracol is conservatively estimated to have grown to at least 100,000 at this time, and was embedded in a landscape of over 160 square kilometers of farmland (A. Chase et al. 2011; A. Chase et al. 2014a: 214; A. Chase et al. 2014b). Although nearly every household at Caracol participated in farming, they also participated in multi-crafting of other goods for exchange at the local marketplaces. These markets were a short distance away, and access to them was provided via the dendritic road system.

However, contextual analysis also searches for craft specialists. At Caracol most residents participated in both agriculture, and specialized craft manufacture as a means of exchange (Chase and Chase 2014: 247; Martindale Johnson 2008). Specialists practiced craft production in residential groups and the goods themselves were exchanged at local markets for other items crafted by other household groups (Martindale Johnson 20014: 90; Martindale Johnson 2008: 40-42).

Lastly, the distributional approach is often employed to identify direct evidence for market exchange (Minc 2006; Hirth 1998). As Smith (2004) points out, controlled distribution will result in a correlation between elite status contexts and higher valued goods. Therefore non-administered circulation, or market exchange, will result in a more homogenous distribution of goods between elite and commoner residences (Smith 2004: 90; Hirth 1998: 463).

The distributional approach has been used frequently throughout the Maya region in recent literature. As discussed previously, the most notable sites in the Maya region in which it has been employed were Caracol (Chase and Chase 2014) and Tikal (Masson and Freidel 2012).

Other notable sites in the Yucatan that have employed these techniques include Chunchucmil (Dahlin and Ardren 2002), Chichen Itza (Braswell 2010), and Mayapan (Masson and Freidel 2012). Thus, chronological antecedents of market systems have been documented in the Maya Region as far back as the Classic Period. The continuation of this practice during the Maya Postclassic Period, however, warrants further discussion. This brief discussion is not intended to 'reinvent the wheel' so to speak, but to situate this research into a broader context of trade and exchange, one which is characteristic of the Postclassic Period Maya of Northern Belize.

In the Maya region of the Yucatan and northern Belize, ethnohistoric accounts describe local marketplaces (Roys 1957: 17). These locales were described as open plazas lined with range buildings (A. Chase and D. Chase 2004: 118), a practiced with antecedents in the Classic Period. Archaeological evidence from Cozumel Island, have identified warehouses and port facilities used as storage facilities for market goods, and possibly market locations themselves (Freidel and Sabloff 1984: 185-192; Smith 2004: 90). Furthermore, market exchange itself is noted as comprising an important facet of Postclassic Maya economies in ethnohistoric accounts (Tozzer 1941: 95).

Several sites have been identified as having central markets using the distributional approach for the Postclassic Period of Northern Belize. These sites include Laguna De On (Masson 2000: 188; 2002: 356) and Caye Coco (Masson 2002: 356). Interestingly, these sites are believed to have fallen under the jurisdiction of the Chetumal Polity during the rule of Nachan Kan in the Late Postclassic Period (Masson 1999: 287; 2000: 2; 2002: 338). Thus, correlates for such a market system at Santa Rita Corozal should not be surprising.

Additionally, the site of Mayapan was also participating in a regional market exchange system (Masson and Freidel 2012). At Mayapan, as at Classic Period Tikal, foreign ceramics, marine shell, obsidian, and other goods have been recovered in both commoner and elite contexts, suggesting market exchange in provisioning of local households.

Characteristically, the coastal Maya have often been categorized as undergoing 'stable' population growth, prosperity, and relative security for the duration of the Postclassic Period (Masson 2000: 1). This region has also been well characterized as 'mercantilistic,' and canoe trade circumnavigated the Yucatan and the coast of Belize (Sabloff and Rathje 1975). Driving this trade was the market system which had been in place since at least the Late Classic Period. Undoubtedly, this system had infused seafood and ritualistic goods into the Maya Heartland during the Late Classic (Cunningham Smtih et al. 2014), as well as salt and other goods into Mexico (Dahlin and Ardren 2002). These systems matured during the Postclassic Period, as the Maya world was increasingly tied with regional Mesoamerican market systems beginning in the Terminal Classic Period (Braswell 2010: 138).

It is well known that market-based exchange continued into the Postclassic Period of the Maya region and in Mesoamerca. For the Maya, the 'mercantilist' nature of this time has often been used to define this period (see Sabloff and Rathje 1975) and dispel misconceptions about the 'decadent' Postclassic (Chase1981, 1982; Sabloff and Freidel 1984). Marketplaces are well known throughout Mexico, and have been well established for the Late Postclassic Period (AD 1300-1520) in the Basin of Mexico (Minc 2006) and in the Central Highlands of Morelos (Smith 2010). Ethnohistoric evidence of a large market at Tlatloco, adjacent to the Aztec capital, is believed to have drawn upwards of 20,000 consumers on certain days (Nichols et al. 2002: 27;

Feinman and Garraty 2010: 168). This system brought goods into Central Mexico from all parts of Mesoamercia, and Postclassic Northern Belize was an active participant in the regional exchange systems which interconnected Mesoamerica at this time.

Northern Belize Lithic Studies

Lithic production and consumption research in Northern Belize is perhaps one of the most studied facets of Maya political economy (Barrett et al 2012). This was not always the case, however, and chert studies in the Maya region were largely ignored before the 1970's. Before this time there was an underestimation of the information which could be gleaned from studying lithic debitage, which translated to a lack of interest in studying lithics in general (Braswell 2012: 2). Part of the problem was undoubtedly due to the practice of archaeologists to focus excavation efforts on large site centers, which inadvertently caused them to miss the "primary social unit of production, consumption, and reproduction," the household (Smith 2004: 85). The practice of largely ignoring lithics began to change in 1976, however, when archaeologists held the 'First Maya Lithics Conference' in Orange Walk Belize. It was at this time that a call was made for lithic analysis to be incorporated into regular site studies (Sheets 1976), thus moving lithic research away from a functionalistic study, to one involving a more holistic vista of the cultural and economic environment (Braswell 2011: 3).

A second lithic conference was held in 1982, and primarily addressed lithic studies from a political economy standpoint (c.f. McAnany 1989, 1991; McSwain 1990; Dockall and Shafer 1993). It was during this phase that Colha was postulated to be a major production center of stone tools. Indeed, the 'full time' craft specialists and standardized tools believed to come from

Colha workshops soon became a prime argument in support of the growing body of researchers exploring the possibility that the Preclassic Maya represented a more complex civilization than was previously identified. An example of this can be found in Marcus (1995: 11), where Colha is listed as the only instance of Middle Preclassic craft specialization. Some even venture that Colha was the first example of full-time specialists in the Maya region (Barrett et al. 2011: 21).

By the time of the Third Maya Lithics Conference in 2007, political economy and producer consumer models were an anchored part of lithic studies (Braswell 2011: 7). More importantly, as opposed to earlier phases in Maya lithic studies, questions were being asked about the nature of the control of these lithic goods as scarce resources themselves. For example, nearly every chapter of the conference publication (Hruby et al. 2011) focuses on some aspect of politically influenced exchange or production of Maya lithic tools. These inquiries were enacted to ascertain broader questions as to the economic nature of the Maya themselves and were less focused on the production or use of the actual tools. Thus, lithic analysis has been increasingly employed by modern researchers to demonstrate economic patterns only evident in household production contexts. Two examples are given to demonstrate different practices in tool production in which chert tool analysis can be used to elicit economic outcomes resulting from a production-consumption context.

Case Studies: Blue Creek

The site of Blue Creek is located in Northwest Belize along the Rio Bravo Escarpment. An extensive ditched field agricultural system supplied the site with ample resources and the site functioned as a commercialization node near the head of the Rio Hondo River (Guderjan 2004:

247; Barrett 2004). Thus, the site would have been a logical port through which inland goods reached coastal markets (Barrett 2004: 297). Imported goods included large quantities of jade, attesting to the sites wealth (Guderjan 2004: 248), and utilitarian stone tools from outside of the site periphery (Barrett et al. 2011: 61). This trade included Colha-like tools from the Northern Belize Chert Bearing Zone, which accounted for nearly half of all tools imported into the site during the Middle Preclassic Period (Barrett 2004: 296). The majority of the remaining tools were procured from a zone of chert and chalcedony outcrops located to the west of the site in the Dumbell Bajo (Barrett et al. 2011: 61).

During the onset of the Terminal Classic Period, residents of the Dumbell Bajo began experiencing a decline in the availability of lithic resources due to an increase in population, as well as a disruption in regional trade routes due to the general instability of this period (Barrett 2004). Overall, the importation of Colha-like tools fell by 21% during the Terminal Classic Period at the site of Blue Creek, necessitating the intensification and importation of tool production from the more local Dumbell Zone. It was during this period, however, that local producers in the Dumbell Zone began experiencing a shortage of non-renewable lithic materials. Evidence of construction materials used for architecture at the primary site of production located within the Dumbell Bajo, the site of Bedrock, indicates the increasingly poor quality of lithic materials used throughout the progression of the 9th century (Barrett 2011: 68). Meanwhile, continued exports of finer quality cherts from this site to Blue Creek continued at a stable rate.

It is unknown whether the continued exploitation of this critical resource beyond the site's capacity contributed to the final abandonment of the Blue Creek settlement zone during the 10th century (Barrett 2004: 300; Barret 2011: 68). Interestingly, the residents of Blue Creek proper had greater access to lithic materials produced in the bajo zone than the residents of the actual zone themselves. This practice continued during the Terminal Classic Period when bajo sites experienced a shortage of materials. Thus, some type of control of the resource was being exercised by the residents of Blue Creek. Furthermore, as Blue Creek households were not fully self-sufficient, goods importation was a necessary aspect of their daily life (Barrett 2004: 297). That elites at Blue Creek controlled the means of exchange at the site in agricultural and riverine products has been suggested (Guderjan 2004: 247), and this control likely included the distribution of lithic resources. Thus, analysis of lithic production and exchange patterns at Blue Creek allow for greater questions of political economy to be addressed. Similar studies have been undertaken at other sites in Northern Belize, albeit with less success. Investigations at the site of Colha in northeastern Belize can be contrasted with patterns found at Blue Creek.

Case Studies: Colha

Nowhere is production of stone tools more evident in the Northern Belize Region than at the site of Colha; yet there is little evidence of any economic benefit stemming from the production of those goods (Barrett et al. 2011: 25). To ascertain if another site was controlling the distribution of Colha tools, researchers soon began hypothesizing that the nearby site of Altun Ha may have controlled the modes of exchange, and not the means of production of Colha craft items (Shafer 1982: 36). In contrast to Colha, excavations at nearby Altun Ha garnered evidence for large amounts of wealth (Pendergast 1965). Additional evidence was suggested as being visible in the shared production strategies of ‘eccentric’ tool forms found at the site of Altun Ha, which were thought to be manufactured at the site of Colha (Shafer 1982: 36; Barrett et al. 2011: 17). However, analysis of the assemblages of symbolic stone artifacts from Colha, Lanamai, and Altun Ha suggests variations in the source material from which they were made (Meadows 2001: 147). More importantly, the assemblages from each site display different technological trajectories, suggesting a disassociation between site workshops (Meadows 2001: 174). Thus, an Altun Ha dominant exchange sphere has been called into question. Currently, it is unknown whether Colha was fully autonomous, or whether another site controlled the distribution of its production workshops.

Regardless of which site controlled Colha goods, it is known that the site was a major exporter of formal tools beginning in the Middle Preclassic Period (BC 1000) until its abandonment in the Terminal Classic Period (AD 800) (Barrett et al. 2011:17). The abandonment of Colha in the Terminal Classic Period was followed by an occupational hiatus (Barrett and Sherer 2005; Barrett et al. 2011) until the Early Postclassic (AD 900-1200). The site is believed to have been abandoned for good sometime during the Early Postclassic (Barrett et al. 2011: 17; Shafer and Hester 1988). Site occupation spanned nearly 3000 years, and the exploitation of the chert resources around the site has left millions of pieces of debitage. Interestingly, the site excavators assert that the crafting practices which produced these tools occurred at the household level and are representative of part time specialists working seasonally in conjunction with other agricultural and craft-based activities (Shafer 1985: 309). Although the political organization of Colha's stone tool industry cannot be ascertained at this time, that Colha tools played a key role in the economic system of Northern Belize is evidenced in assemblages throughout the region (Hester 1985).

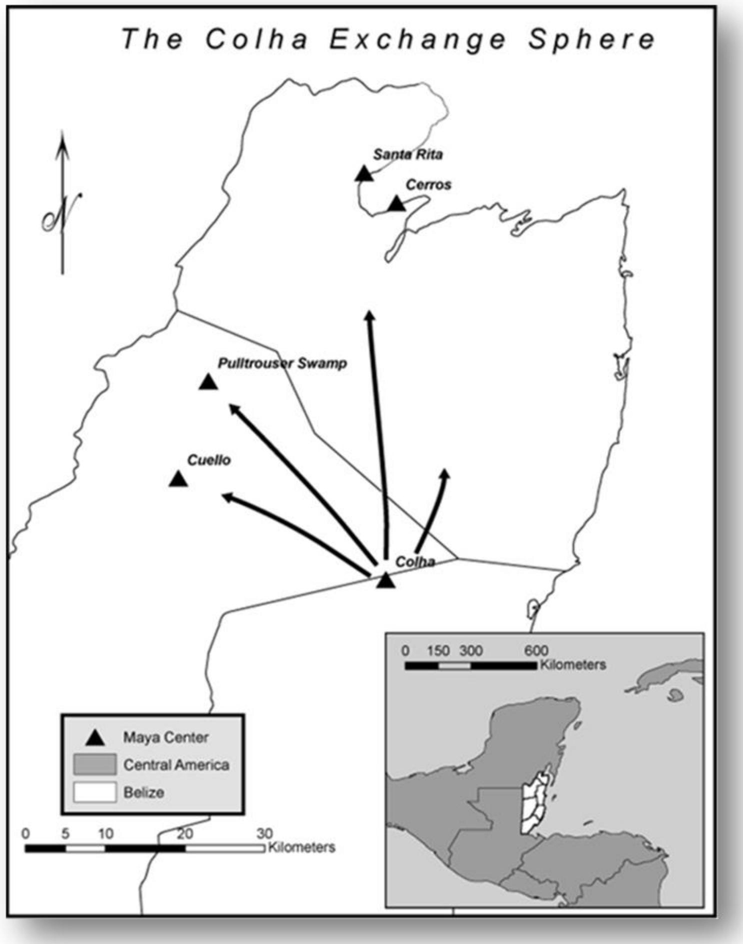

Figure 2: Northern Belize-Colha Exchange Sphere

Colha's tools have been recovered from nearly all sites in Northern Belize and date from the Middle Preclassic to Terminal Classic Periods. These sites include Pulltrouser Swamp (McAnany 1989), Cerros (Mitchum 1991), Cuello (McSwain 1990), Chau Hiix (Chiarulli 2012), and Santa Rita Corozal (Dockall and Shafer 1993). The tool forms recovered from these locations mirror the tool forms produced in Colha household production centers and include the oval biface, tranchet bit tool (adze), large stemmed macroblade, the small stemmed macroblade, and several varieties of biface systems produced towards the Postclassic Period (Barrett et al.

2011: 18). The production of these tools remained relatively stable until the onset of the Early Postclassic Period, when projectile point production eventually overtook, and then surpassed the production of all other tool forms in the Colha assemblage (Hester and Shafer 1991: 156: Hester 1985). The site was finally abandoned in the Early Postclassic Period (Barrett et al. 2011). Thus, production of chert tools has been well described in the archaeological literature for the Preclassic and Classic Periods. Therefore, comparisons can be drawn between Postclassic chert production strategies with earlier time periods.

What does Production Look Like?

Evidence of lithic production in the archaeological literature has been studied extensively for Northern Belize. Debitage characteristics of production include a full reduction sequence, depending on the tool type that is being produced (Clark 1991). It is known that different tool forms follow different production trajectories (Whittaker 1994: 261; Wenzel and Shelley 2001: 120) and great caution must be used in trying to infer reduction sequences when analyzing debitage in contexts where multiple strategies were employed (such as Santa Rita Corozal). Production at the site of Colha involved both biface and blade reduction strategies (Hester et al. 1982), thus providing a good debitage sample in which to find analogous material at other sites. Previous studies indicate that debitage indicative of biface and blade production should include cortical flakes, prepared cores, core-rejuvenation flakes, biface thinning flakes, flake blanks, and finished tools (Hester et al. 1980; 1982). This approach has been tested and the validity of this method has been established at other sites in Northern Belize, including Pulltrouser Swamp

(McAnany 1989), Cuello (McSwain 1990), Cerros (Mithum 1991), and lastly at Santa Rita Corozal (Dockall and Shafer 1993).

Other studies in the Maya region have followed similar identification methods. Blade production especially has been analyzed in other areas of the Maya region, and it has been demonstrated that chert blade production can follow similar techniques as obsidian blade production. For example, at the Classic Maya Polity of Caracol, it has been demonstrated that pressure flaking techniques were employed in chert blade production, likely as a result of disseminated or shared knowledge with obsidian blade producers at the same site (Martindale-Johnson et al. 2014). Additionally, other techniques, such as platform grinding and intentionally 'faceting' platforms, have been demonstrated to frequently occur in both obsidian blade production and chert biface production (Healan 2009; Will 2000; Shafer and Hester 1988). However, grinding and faceting are more often used in later stages of production, such as maintenance and curation (Will 2000; McAnany 1989; McSwain 1990) and consequently are not a key aspect of this study. Therefore, the recovery of a debitage sample only inclusive of cortical flakes, prepared cores, core-rejuvenation flakes, biface thinning flakes, and unfinished or preform tools will be examined in this research.

Lithic Points

Previous analyses of the style of projectile points that occur at Santa Rita have been briefly addressed in the archaeological literature. The points were characterized by Shafer and Hester (1988) in their assessment of Postclassic tool forms recovered at Santa Rita Corozal. Shafer and Hester note that the points occur frequently throughout the Postclassic Maya region, an assessment which is corroborated by Andressen (1976), who notes their occurrence in other locations of Northeastern Belize.

Figure 3: Santa Rita Corozal-Sample of Small Side-Notched Projectile Points

Additionally, Hester (1985) notes the production of similar tools from Postclassic contexts at Colha, where they occur frequently in local production contexts. In Northwestern Belize, at the site of El Posito, two points described as “identical” to the forms found at Santa Rita Corozal are noted (Shafer et al. 1991: 74). Similar points found outside of Belize at Mayapan bear stylistic features resembling the Santa Rita points (Paling 2007). An additional seven points were recovered from Postclassic contexts at Tayasal (A. Chase 1983:1320). Lastly, points recovered from the Great Cenote at Chichen Itza also resemble the tool forms recovered at Santa Rita Corozal, although this cannot be determined at this time based on the description given in the literature (Sheets 1991: 171).

The greatest frequency of projectile points currently discussed in the literature was found at the Postclassic site of Mayapan. In total, 75 chert and chalcedony points stem from the entire site of Mayapan during the Postclassic Period (Paling 2007). This total is equivalent to a single structure, Structure 218, at Santa Rita Corozal. Furthermore, the total amount of recovered chert, chalcedony, and obsidian projectile points at Santa Rita Corozal equals 286 specimens, and corroborates previous assessments that these points were found in more frequency at Santa Rita Corozal than at Mayapan during the Late Postclassic Period. A similar statistic had been previously noted by the primary investigators (D. Chase 1992:124); and demonstrates the scale of craft production which occurred at residences located throughout Santa Rita Corozal during this time.

Stylistically, the points are given an identification of being small and side-notched with either contracting or straight bases. Additionally the points were identified as being pressure flaked on curved flakes and blades and as having examples of fine craftsmanship (Shafer and Hester 1988; Andressen 1976; Sheets 1991: 171). Lastly, the points are noted for being formal tools, or objects which are intentionally made on previously made blades or flakes (Shafer and Hester 1988; Andressen 1976).

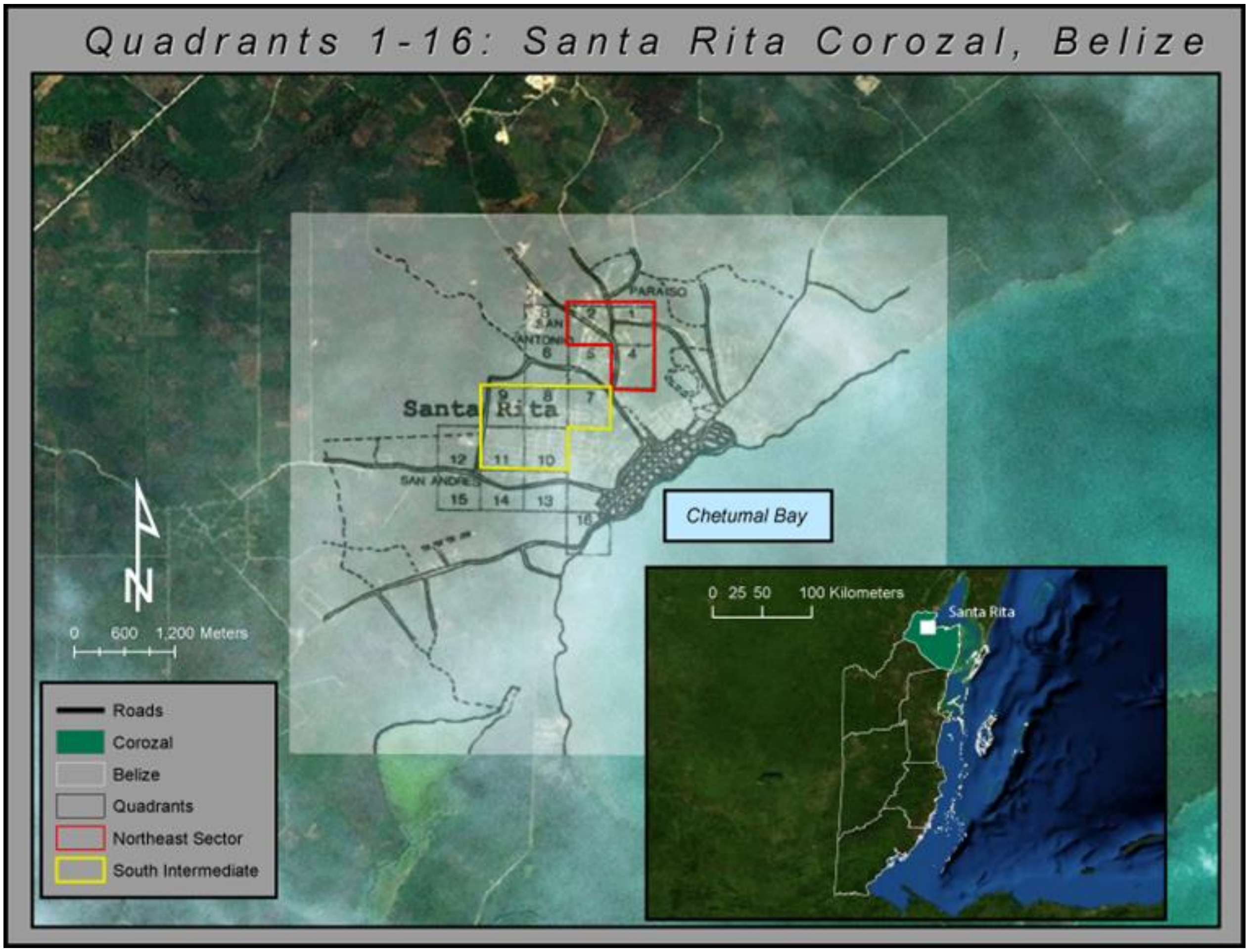

Figure 4: Site Study Areas (After Chase and Chase 1988)

Areas Identified as Lithic Craft Production Loci Occur in the Yellow

CHAPTER 3: METHODS

Workshop Location

In order to test the hypothesis that formal tool production was occurring onsite, it was first necessary to review the data which had already been analyzed by previous researchers (Shafer and Hester 1988). It was hoped this previously analyzed data would lead to the identification of a chert workshop in which points were produced and that analysis of the rest of the collection could follow. In order to accomplish this goal, the Santa Rita Corozal assemblage selected by the Corozal Postclassic Project (D. Chase and A. Chase 1988) was inventoried for the exact amount of projectile points and their exact locations in archaeological contexts. In all 259 chert and chalcedony small, side notched projectile points were identified, along with 27 obsidian points.

This contrasts with the small sample of 21 points (< 10%) that had been examined by Shafer and Hester (1988), despite their access to the full Santa Rita Corozal point collection. Although it had been noted by the Corozal Postclassic Project that craft production occurred in the greatest frequency in the South Intermediate Sector of the site (D. Chase and A. Chase 1988: 54; D. Chase 1992: 123-124), the points selected for study by Shafer and Hester (1988) were restricted to the Northeast Portion of Santa Rita Corozal, and primarily stemmed from Operations P8 and P6 (Shafer and Hester 1988: 111); or Structures 74, 81, and Platform 2, respectively (Chase 1982: 250-402). It was found that while the sample examined by Shafer and Hester were found in Postclassic contexts, tool forms represented in this area extended as far back as the Preclassic Period (Shafer and Hester 1988: 117). Therefore, in order to better refine the placement of the points in the archaeological record, locations in which projectile points were found were examined for definite Postclassic temporal contexts.

After the entire collection was examined it was noted that the majority of the points actually came from the South Intermediate sector of the site (see Figure 1), an occurrence that had been distinguished during excavations (D. Chase and A. Chase 1988: 54; D. Chase 1992: 123-124), but had not been the focus of previous analysis by Shafer and Hester (1988). For this reason, the debitage recovered from the Northeast Sector was excluded from further analysis, and only the points themselves were examined from this part of the site.

Further examination of the collection led to the identification of two structures which accounted for roughly 38% of the total site sample. These two locations have been identified as Structures 216 and 218, containing 36 points and point preforms, and 74 points and point preforms, respectively (See Table 1). The excavation records from the 1985 field season of the Corozal Postclassic Project, and the descriptions of the two structures by the primary investigators in the extant literature, place these two structures as Postclassic in construction and use (D. Chase and A. Chase 1988). Therefore, all the debitage associated with these two Postclassic buildings were used in this analysis.

Table 1: Postclassic Projectile Points

Postclassic Points by Structure			
Op	Structure #	Material	Total PPoints
P_38	218	50 Chert; 12 Chalcedony; 11 NBC; 1 Obsidian	74
P_33	216	22 Chert; 3 Chalcedony; 7 NBC; 4 Obsidian	36
P_30	189	8 Chert; 4 NBC; 2 Chalcedony; 2 Obsidian	16
P_36	181	12 Chert; 0 Chalcedony; 1 NBC; 2 Obsidian	15
P_8	81	7 Chert; 2 Chalcedony; 3 NBC; 3 Obsidian	15
P_26	213	2 Chert; 5 NBC; 6 Chalcedony; 1 Obsidian	14
P_6E	Platform 2, Near 73	8 Chert; 1 Chalcedony; 3 NBC; 0 Obsidian	12
P_23	166	5 Chert; 3 NBC; 1 Obsidian	9
P_34B	Str. "D" 179?	8 Chert; 0 Chalcedony; 0 NBC; 1 Obsidian	9
P_32	214	6 Chert; 0 Chalcedony; 1 NBC; 2 Obsidian	9
P_34A	167	4 Chert; 1 Chalcedony; 1 NBC; 1 Obsidian	7
P_6C	Platform 2, 74	3 Chert; 1 Chalcedony; 2 NBC; 1 Obsidian	7
P_31	6	3 Chert; 2 NBC; 1 Chalcedony	6
P_6F	Platform 2, 77	2 Chert; 2 NBC; 2 Chalcedony; 0 Obsidian	6
P_3	58	1 Chert ; 2 Chalcedony; 1 NBC	4
P_37	183	3 Chert; 0 Chalcedony; 0 NBC; 2 Obsidian	5
P_6H	Platform 2, 79	1 Chert; 2 Chalcedony; 2 NBC	5
P_19	160	2 Chert; 1 NBC; 1 Chalcedony	4
P_20	39	2 Chert; 2 NBC	4
P_22	37	3 Chert	3
P_27	212	2 NBC; 1 Obsidian	3
P_28	182	2 Chert; 1 Obsidian	3
P_29	215	2 NBC; 1 Obsidian	3
P_35	38	3 Chert	3
P_6G	Platform 2, 80	1 Chert; 1 Chalcedony; 1 Obsidian	3
P_10	35	1 Chert; 1 NBC	2
P_14	200	1 Chert; 1 NBC	2
P_6B	Platform 2, 77	1 Obsidian; 2 NBC	3
P_18	156	1 NBC	1
P_2	7	1 Chalcedony	1
Unknown		1 Obsidian	1
P_7	?	1 Chert	1
31 Structures			286

(Table Arranged by Point Frequency)

However, trenching through the center of Structure 216 recovered an earlier construction at a depth of .9 meters (Chase and Chase 1988: 54). These earlier materials were collected in separate lots (Susan Jaeger 1985, Fieldnotes), and all materials recovered in these lots (after lot 50) have been excluded from this analysis.

A similar, yet much different scenario occurred in Structure 218, where a Preclassic trash inclusion was found beneath the fill for the Postclassic construction (Chase and Chase 1988: 60); these earlier materials began in lot 56 of a center-line trench (Jaeger 1985, Fieldnotes). This inclusion began in lot 55 of the excavation (Susan Jaeger 1985, Fieldnotes). No significant amount of debitage nor any points were recovered from these earlier lots. However, the reuse of tools and fill materials taken from earlier contexts was a common practice for the Maya (Masson 2000: 133; Chiarulli 2010: 105; Martindale Johnson 2014: 85), yet the few pieces of material associated with this inclusion have been excluded as well. Thus, this analysis breaks with earlier methodologies used previously in the examination of formal tools recovered at Santa Rita Corozal in the exclusion of artifacts which have been found to date to earlier periods.

A second difference in methodology can be found in the scope of this analysis. While previous lithic research at Santa Rita Corozal sought to examine regionally defined 'producer-consumer' relationships between the sites of Colha and Santa Rita Corozal, Belize (Shafer and Hester 1988:111; Dockall and Shafer 1993:158-159), this thesis examines a site specific analysis of lithic craft production. Thus, while others sought regional patterns of exchange and consumption, this research first examines local patterns of production, and then investigates extra-site exchange interactions using a site specific data-driven approach.

Biface Thinning Flake Identification

Biface thinning flakes are a known by-product of biface production (Andrefsky 2000: 20; Whittaker 1994: 185). In order to test the hypothesis that the projectile points were being manufactured on biface thinning flakes, it would be expected to find both a large amount of bifacial thinning flakes at the workshop location, and several preform points showing evidence of having been produced on this flake type.

Methods used to identify bifacial thinning flake debris have been amply described in the literature, although authors often disagree over methodology (Andrefsky 2001: 2). Biface thinning flakes were identified in this paper based on the presence of a small, diffuse bulb of percussion, and the presence of a lipped platform (Whitaker 1994: 185-187) (See Figure 2). Other researchers use different classification schemes in thinning flake identification, such as curvature (Andrefsky 1986), and complex striking platforms and edge angle identification (Will 2000: 117; see Pelcin 1997:753). However, these methods are often found in blade-core reduction strategies used in blade manufacture (Andrefsky 1986: 49; Healan 2009) and are therefore ineffective in identifying production strategies using mixed samples in contexts which may have included both biface and blade production, such as the Santa Rita Corozal sample.

Another problem with these methods is the lack of a standard employed in their identification. For example, as illustrated by Andrefsky (2001) when calculating the level of complex faceting on a platform, there is no consensus as to what an abnormal amount of platform facets are; all platforms will appear to be faceted when under magnification, and the level of faceting has been demonstrated to increase as magnification increases. Similarly, when measuring edge angle, there is no consensus of where to begin to orient the platform of the artifact, and this problem is exaggerated even more when artifact conditions are poor or when platform morphology is highly irregular (Andrefsky 2001: 10; Pelcin 1997: 755). Lastly, flake curvature can result in a similar degree-value for both bifacial thinning flakes and blades. Therefore, these methods are not used in this analysis. As stated earlier, bifacial thinning flakes were identified based on platform morphology, specifically by the identification of the presence of small, diffuse, or lipped platforms.

To record platform type, the entire debitage sample from Structure 216 (n= 1,027) was first separated by operation number from the complete Santa Rita collection. Each piece was examined using 10 x 20 magnifications on a jeweler's loupe, in order to identify platform type. The various platform types were then categorized based on platform morphology. Lastly, the entire debitage sample was measured for width, length, and thickness using standard 1mm calipers, and subsequently weighed at a 100^{th} of a gram using a Triton T3 400g x .01g digital scale. All attributes for Structure 216 can be found in Appendix A.

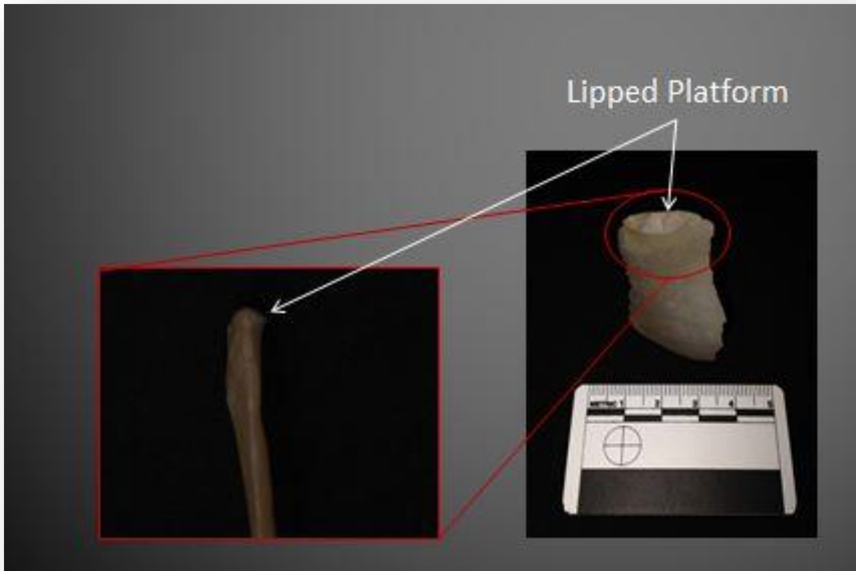

Figure 5: Biface Thinning Flake-Lipped Platform

(Note: Artifact Resembles Blade, but can be Distinguished as Thinning Flake Based on Platform)

Structure 218 had also been identified as a possible locus of production, and was therefore also investigated. Using the same techniques undertaken in Structure 216, the debitage (n=1208) was first separated by operation. The sample was then subsequently examined using 10 x 20 magnification, and categorized by platform type. The debitage sample was then weighed and measured, the attributes for this sample can be found in Appendix B.

<u>Blades</u>

Previous research had suggested the possibility of projectile point manufacture occurring on blades, and ethnohistoric evidence suggests that modern Lacandon Maya of Highland

Guatemala still practice a similar manufacturing technique to this day (Clark 1991). To test this hypothesis it was necessary to identify blade production occurring in workshop contexts and identify preform projectile points evidencing platforms remnant of prismatic blade production.

Prismatic blade production has been well reviewed in the archaeological literature, and it has been demonstrated to be evidenced in platform morphology as well as in the presence of two or more ridges on the dorsal surface (Healan 2009: 104). Blades are typically produced by mechanisms of conchoidal fracture and, therefore, contain larger and more prominent bulbs of percussion than thinning flakes (Cotteral and Kaminga 1987) and maintain that prominence equally throughout the body of the blade. This means that the blade platform will maintain its thickness for a greater length of the tool in comparison to a biface thinning flake (See Figure 3). As with bifacial thinning flakes, the presence of grinding, faceting, curvature, and less acute edge angling have been used to define blade production in the recent literature. However, for reasons previously stated, these classification schemes will be left out of this analysis, especially as the reliability of their usage is questionable in contexts of both biface and blade production.

The identification of blade production was accomplished by examining the remaining debitage not associated with biface production. This remaining debitage sample from Structures 216 and 218 was examined for platform type using 10 x 20 magnification. The collection was subsequently categorized based on platform morphology, and then weighed and measured in the same fashion as the biface thinning flakes.

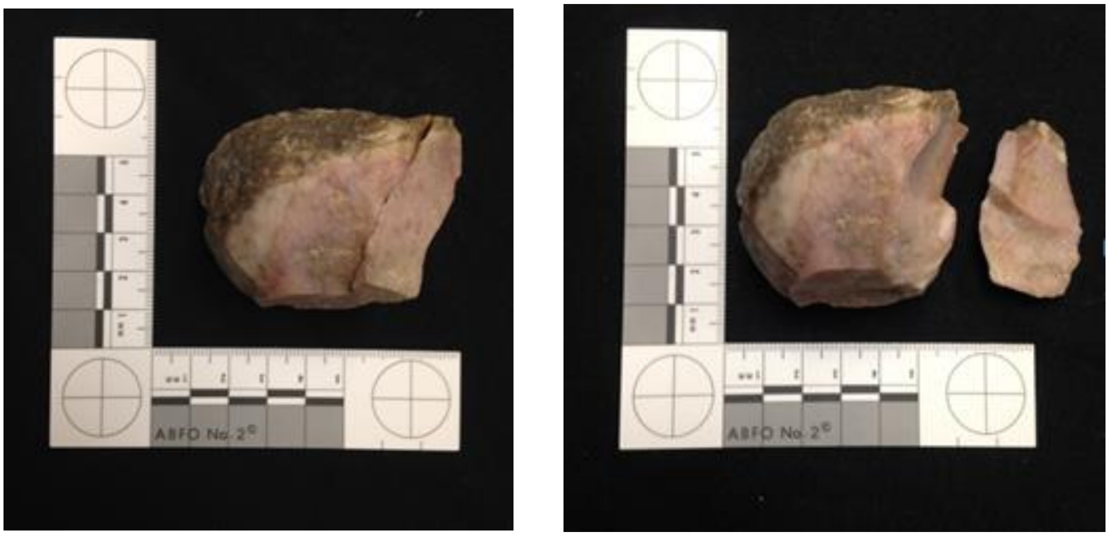

Figure 6: Blade Core Reduction at Santa Rita Corozal

(Note Cortex and Non Colha-Like Material)

Points and Material Variation

A significant part of this study lay in determining raw material source location for formal and informal tool manufacture during the Postclassic Period at Santa Rita Corozal. In order to accomplish this goal, all tools were analyzed for source material using visual sourcing methods. Colha-like Northern Belizean cherts have proven to be identifiable using visual sourcing methods. Visual sourcing of Northern Belize Chert has been used frequently in the literature for over 30 years, and the validity of this method has been repeatedly demonstrated (Cackler et al. 1999; Meadows 2001). This study utilizes visual sourcing methods, and only seeks to document Colha-like chert, chalcedony, and other presently unknown Northern Belize Cherts. Colha-like chert is brown to tan in color; and includes honey brown, brown, tan, and mottled pale brown. It is identified based on its uniformity in texture and color throughout the stone, and is exceedingly fine in texture (Meadows 2001:283). Non Colha-like chert is not as fine in texture and less uniform in color and quality (Chiarulli 2012:96; Meadows 2001:283). Lastly, chalcedony is noted for being translucent, nearly transparent gray or transparent brown in color, and coarse in texture with more impurities in comparison to cherts (Chiarulli 2012: 100). Therefore, chert was first separated out from the rest of the lithic sample, and then further sorted as either Colha-like chert or non Colha-like chert.

Several other chert outcrops have been documented in Northern Belize besides the outcrops which surround Colha. Outcrops are known from Altun Ha (Kelly 1982: 93-95), Kichpanha (Shafer 1982), and several other sites in the area (see Kelly 1980; 1982). It should also be noted that lesser quality cherts were exploited during the Late Postclassic Period in the vicinity of Progresso Lagoon, near Laguna de On and Caye Coco (Masson 2002: 356). Although none of these sites reached a scale in production near that of Colha, they do demonstrate other chert resources that were utilized in the Northern Belize region.

All projectile points were analyzed using 10 x 20 magnification. Additionally, they were measured using standard 1mm calipers and weighed using a digital scale to the 1/100 of a gram, and subsequently categorized into groups of obsidian, chalcedony, chert, or Colha-like Northern Belizean chert. This part of the analysis was undertaken in conjunction with Nathan Meissner, who was analyzing the Santa Rita Projectile Point sample for inclusion in his dissertation research (Meissner 2014). The sample of formal tools was then compared against the sample of debitage stemming from Structures 216 and 218.

Debitage from the two structures was analyzed completely as well; this includes all debitage forms. These forms are inclusive of bifacial or blade production, as well as the associated unidentified waste flakes and reduction debris. The complete debitage sample was included to garner an accurate view of all tool production occurring at Santa Rita Corozal and not just formal tool production. Debitage was categorized into groups of chalcedony, chert, and Northern Belize chert. Sourcing the obsidian was not done in this study, but warrants future research.

CHAPTER 4: RESULTS

Structure 216

Structure 216 produced a total sample of 36 projectile points (Table 1), or roughly 12.5% of the total point sample from Santa Rita Corozal. Of these 36, 9 are unfinished or preform (see Appendix C: Table 1). Two points from this structure retain their original platform. Preform points that retain a platform from this structure are represented by one specimen (P33B/14-8b). This platform is indicative of bifacial thinning in that it retains a platform with a diffuse bulb of percussion. An additional two finished points bearing a platform were recovered from this location, and are also indicative of bifacial thinning, as identified from their platform morphology. One unfinished point (P33B/17-6) did not retain a platform, but could be identified as a blade fragment based on the presence of two dorsal ridges running the length of the piece. This piece maintained a form similar to a small prismatic blade, and can therefore be identified. The remaining 6 preform points do not illustrate any definite evidence of core reduction strategy; however, the average medial thickness of the projectile point sample is 3.43 mm, and the only flake types able to produce these thin cross-sections are either biface thinning flakes or small prismatic blades.

In addition to the projectile point collection, Structure 216 yielded a total debitage sample of 1027 pieces of reduction debris (see Table 2). This sample represents a complete reduction sequence, as flakes, cores, hammer stones, and both formal and informal tools are represented in this collection. Informal tools are primarily represented by expediently produced tool fragments, showing heavy use before they were discarded.

The total sample of bifacial thinning flakes recovered from Structure 216 equates to 269 specimens. Of these, 22 were complete enough to identify based on overall appearance, despite lacking a platform. The remaining 247 were identified based on platform morphology, specifically the identification of a small, diffuse, lipped platform. In total, the debitage comprised of biface thinning flakes equals 26% of the debitage sample stemming from Structure 216.

In addition to biface thinning flakes, 45 chert blades were recovered from Structure 216. Blades were identified based on the presence of a large platform, or two or more dorsal ridges running the length of the piece. Characteristically, blades recovered from this structure are small and highly fragmented, with the largest specimen only measuring 4.9cm. Blade and blade fragments only account for 4.5% of all debitage recovered from this structure, however, meaning that blade manufacture was not a significant craft activity at this structure.

Forty biface and biface fragments were recovered from this locus (see Appendix B: Table 4), and with the exception of 3, all were heavily fragmented. Complete bifaces include forms that are well represented in many site assemblages during the Late Postclassic Period. These forms include a triangular biface (P33A/35-1), a thin biface (P33B/4-2), and a complete bifacial core used expediently as a biface (P33B/9-1). These forms have been found in other portions of Santa Rita Corozal (Shafer and Hester 1988) as well as at Laguna De On (Masson 2000: 136).

Fragments include various oval bifaces, small celts, and dart fragments, all represented by distal, proximal and medial portions. Interestingly, two proximal fragments of lenticular bifaces were recovered. These highly fragmented pieces are only represented by the ‘stem’ portion of the tool. They should not be confused with the stem portion of a stemmed macroblade, as these are typically more rounded. Lenticular bifaces are known to have been produced during the Postclassic Period, while stemmed macroblades are a technology reminiscent of earlier Maya. Four more examples of these artifacts have been classed separately, as their initial type can only be inferred from their currently fragmented form, (see Appendix B: 3).

One chalcedony core converted to a hammer stone and 6 additional cores indicate primary biface production for household consumption occurred at this location. These cores are all represented by multidirectional flake scars and can thus be classified as biface cores. One core is quite large and has measurements of 11.12cm X 7.9cm; it retains cortex on two exterior surfaces. A second core, although not as large as the first one, is complete. The remaining four cores are highly fragmented, demonstrating the actual use of these tools at this location.

Lastly, production-related waste flakes and cortical flakes were recovered from this location. Waste flakes and shatter amounted to 560 pieces of reduction debris, while cortical flakes are represented by 102 specimens. Cortical flakes account for 10.1% of the location sample and suggest initial reduction was occurring at this structure; however these numbers do support an argument for primary reduction occurring for all tool forms or materials.

Table 2: Structure 216 Production Related Debitage

P33 Tool Forms and Materials Discussed										
Material	**BTF**	**BTFNP**	**Unident.**	**Biface**	**Cortex**	**Blade**	**Core**	**Hammerstone**	**Stem**	**Total**
Chert	150	14	396	28	60	24	4	0	3	679
NBC	61	5	101	8	12	11	0	0	0	198
Chalcedony	35	3	63	2	32	8	2	1	1	147
Total	246	22	560	38	104	43	6	1	4	1024
Percentage	24.0	2.1	54.6	3.7	10.2	4.2	0.6	0.2	0.4	100

(BTF= Biface Thinning Flake; BTFNP= Biface Thinning Flake No Platform)

Operation P33 Materials

Materials used in the production of points at Structure 216 are comprised of four different materials: cherts from the Belize Chert Bearing Zone (NBC; Colha-like Chert), local cherts of less quality, chalcedony, and lastly obsidian (see Table 3). The identification of source materials was accomplished for both finished and preform tools, as well as the entire debitage sample from Structure 216.

Table 3: Structure 216 Projectile Point Material Variation

P33		%
Chert	22	61.1%
NBCBZ	7	19.4%
Chalcedor	3	8.3%
Obsidian	4	11.1%

The material used most frequently in the production of projectile points at Santa Rita Corozal was non-Colha like cherts, as this material comprises 61% of the point sample stemming from Structure 216 (see Appendix A: Table 2). This can be contrasted with Northern Belize Cherts, which comprise 19% of the sample from this structure, and is the second highest frequency of material used to construct the tools themselves. Chalcedony only accounts for 8% of the sample, while obsidian accounts for 11%.

The debitage recovered from Structure 216 reflects a similar pattern as the points. Of the total sample of 1027 pieces of debitage recovered from this structure, non Colha-like cherts account for roughly 681 specimens. These lesser quality cherts comprise a total 66% of the sample from this structure. The next highest frequency of material used in tool manufacture is Colha-like Northern Belize Cherts that comprise 19% of the site sample. Chalcedony accounts for 14% of the debitage sample from Structure 216. No obsidian debitage was recovered in this sample, indicative of production elsewhere. Estimations of the entire obsidian sample stemming from this structure comprise less than 100 artifacts.

Table 4: Str. 218 Production Related Debitage

P38 Tool Forms and Materials Discussed										
Material	**BTF**	**BTFNP**	**Unident.**	**Biface**	**Cortex**	**Blade**	**Core**	**Hammerstone**	**Stem**	**Total**
Chert	128	15	422	18	121	59	31	0	6	800
NBC	59	15	113	13	23	8	0	0	1	232
Chalcedony	8	1	51	3	31	10	1	2	0	107
Total	195	31	586	34	175	77	32	2	7	1139

(BTF= Bifacial Thinning Flakes; BTFNP= Bifacial Thinning Flakes No Platform)

Structure 218

Structure 218 proved to be the source of the most projectile points found in a single location at Santa Rita Corozal; 74 of the entire site sample of 286 points was recovered from this building (Table 1). Eleven of the points excavated from this location contain a platform (see Appendix C: Table 2). Nine of these platforms are characteristic of bifacial thinning in that they contain a diffuse and small bulb of percussion. Lastly, one point contained a platform that had been modified beyond identification of specific technology.

The most preform points also stemmed from Structure 218, Totaling 20 unfinished tools. Of these 20 preform tools, 6 retain their original platform. Five of these platforms bear forms resembling bifacial thinning. They include diffuse and less prominent bulbs of percussion, with some remnant edging also evident. One of the specimens (P38A/8) retains a platform that has been substantially modified so that identification of the platform type is not possible.

Structure 218 also yielded a complete debitage sample representing a full reduction sequence (see Table 3). Bifacial thinning flakes were recovered from this location and equal 235 specimens, along with 84 blade and blade fragments. Additionally 190 flakes bearing cortex were recovered. Other debitage included 32 core and core fragments, and 34 biface fragments. Lastly, two hammerstones were recovered and 616 production related fragments and waste flakes were recovered.

Table 5: Str. 218 Point Material Variation

P38 (Points)		%
Chert	50	68%
NBCBZ	12	16%
Chalcedony	11	14%
Obsidian	1	1%

Formal tool material composition was strikingly similar to results garnered from Structure 216 with the most frequent material used being less quality cherts exterior to the Rancho Creek beds which surround Colha (see Table 4). These tool forms comprised roughly 68% of the sample of tools from this location. Higher quality cherts stemming from the Belize Chert Bearing Zone comprised roughly 16% of the sample from Structure 218. Chalcedony use was found to occur in similar numbers as Northern Belize Chert from this location; 14% of the sample from Structure 216 was comprised of this material. Lastly, obsidian accounted for a little more than one percent of lithics used from Structure 216 in association with projectile points.

The debitage recovered from Structure 218 reflects the same mineral patterns as the formal tool assemblage recovered from the site (see Table 3). The predominant material used is non-Colha like chert, which represents 71% of the debitage sample. The next highest frequency of material is chert stemming from the Belize Chert Bearing Zone, which comprises roughly 20% of the sample excavated from Operation P38. Chalcedony differs in debitage versus finished and preform tool forms by 5%; debitage recovered from this location was comprised of 9% chalcedony. Finally, obsidian was not part of the study, but there were few specimens at this locus.

High Status Residences

Architectural features of Operations P33 and P38 had previously been identified as high status residents (D. Chase 1986: 353; 1992, Figure 8.1: 124), and likely the residence of a *principal* (D. Chase 1986: 365). Features used to identify Postclassic Period high status residences are visible in the archaeological record by the presence of multiroom architecture, intensive burial practices, and more intensive caching practices (see D. Chase 1986: 353-358). Evidence of all three is visible at these two structures (D. Chase 1986; 1992; D. Chase and A. Chase 1988).

Operation P33 (Structure 216) consisted of a 200 square meter areal excavation, with a 2 meter wide east-west axial trench was ran through the center of the excavation, revealing a multi-roomed structured (Chase and Chase 1988: 54). Two Postclassic shrines were also found associated with this structure, one located on the northern portion of the excavation and one located in the center of the structure (Chase and Chase 1988: 56). Additionally, a flexed burial containing two individuals was found directly below the central shrine, in association with a spondylus shell bracelet, a jade and spondylus necklace, stingray spines, and turquoise and gold earplugs with obsidian backings (D. Chase and A. Chase 1988: 55; 1986: 18).

Operation P38 (Structure 218) consisted of an areal excavation with a similar placement of a 2 meter trench on an east-west axis through the center of the structure. The structure was completely represented within the excavation, revealing a multi-roomed Postclassic building that encompassed 165 square meters of space. In addition, there was an altar set in the rear of the structure. This structure also included three Postclassic deposits including two flexed burials, one of which consisted of multiple individuals, as well as a ceramic Cao Modeled cache vessel 12cm in length that depict a shell with an emerging human face, surrounded by a feline (D. Chase and A. Chase 1986:14). Other artifacts recovered in association with the interments were several bells, one of which was silver (D. Chase and A. Chase 1988: 60). The association of small notched projectile points had been previously correlated with high status residences (D. Chase 1986: 357); and the association of production debris with both buildings suggests that higher status individuals engaged in lithic production activities.

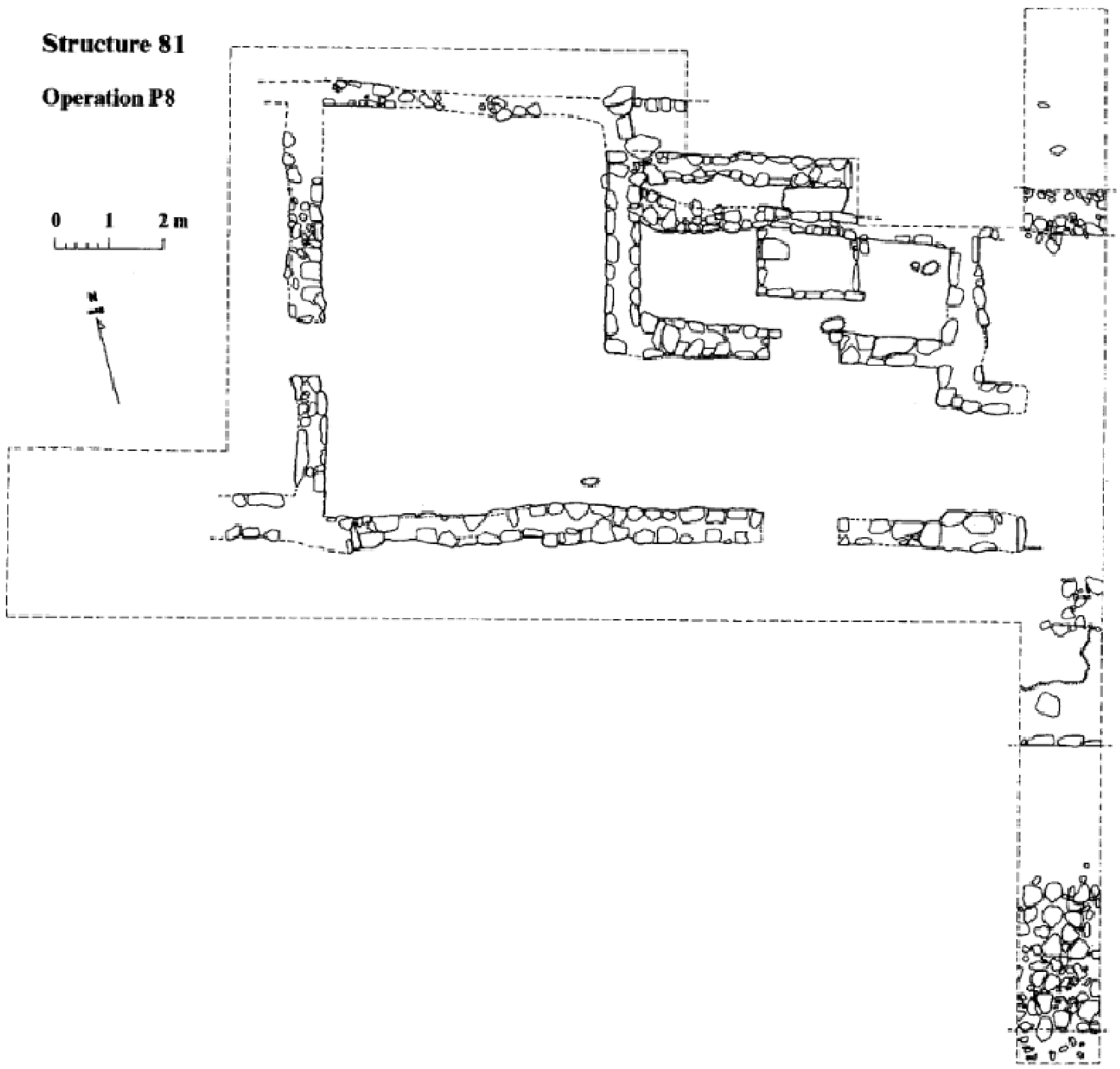

Figure 7: Structure 81, Example of Late Postclassic Multiroom Construction with Shrine

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CHAPTER 5: DISCUSSION

Production from Operation P33 (Str. 216)

Evidence for household lithic craft production at Santa Rita Corozal derives primarily from the recovery of a complete lithic reductive sequence at two Late Postclassic residences. One of these locations, Structure 216, had been previously identified by the primary investigators of the Corozal Postclassic Project as a location 'utilized in the knapping of flint arrow points' (D. Chase and A. Chase 1988: 54). Analysis of the debitage stemming from this residence produced ample evidence to demonstrate that production was indeed occurring at this location. Examination of the production debitage yielded a sample of 1063 pieces of production debris, including 36 finished and unfinished Late Postclassic projectile points. Evidence of lithic production at Structure 216 is summarized here, as well as the evidence for projectile point manufacture.

Production-related waste flakes, angular chunks, and micro-debitage comprises 54% of the total debitage sample. These flakes and chunks are the product of chipping waste produced by the physical act of lithic reduction. Although they do not contain a platform and cannot be shown to demonstrate intended tool morphology, their presence strongly supports arguments for onsite production. Lithic manufacture cannot occur without the production of waste flakes; therefore, the presence of waste flakes provides evidence that lithic production occurred (Moholy-Nagy 1990: 268).

Behavioral inferences, such as intended tool type, are evident in either finished tool forms or in the typological analysis of platform bearing debitage (Parry and Kelly 1987; Andrefsky 2001: 8). Platform-bearing flakes and specimens large enough to identify based on typological characteristics from Structure 216 were analyzed; they number 319 artifacts or roughly 30.5% of the debitage sample from this location. Of these flakes, 85.3% can be classified as bifacial thinning flakes and 14.6% as blade and blade fragments.

Biface and biface fragments amounted to 40 specimens and all show heavy signs of reuse and recycle. Cores accounted for 6 specimens, and all show signs of multidirectional scarring indicative of biface core manufacture. Lastly, cortex flakes account for 104 specimens or 10% of the sample from Structure 216.

Thus, it can be inferred from the debitage sample recovered from Structure 216 that lithic production did occur at this location during the Late Postclassic Period. Additionally, as has been stated earlier, this structure yielded 9 preform projectile points, and 27 complete specimens. Two of the complete points proved to have platforms remnant of bifacial thinning; the remaining platform occurred on a preform specimen and is also indicative of biface thinning. The recovery of a complete reduction sequence, preform tools, as well as finished products at one craft locus provides strong evidence supporting arguments for the local production of this particular tool type. The recovery of bifacial cores, biface thinning flakes, as well as preform and finished points bearing platforms remnant of bifacial reduction, suggests that many points were made on bifacial thinning flakes.

Production from Operation P38 (Str. 218)

Household craft production from Structure 218 is evidenced by the recovery of a complete reduction sequence, including cores, cortical flakes, biface thinning flakes, blades, and flake blanks. Structure 218 yielded a sample of 1201 pieces of reduction debris. Of the debitage recovered, 235 biface thinning flakes, or 19% of the debitage sample from this location, were recovered. Biface and biface fragments numbered 34 and were heavily utilized and recycled. Cortical flakes numbered 190 specimens (15.7%). Blade core and core fragments equaled 32. Blades numbered 84 specimens or roughly 7% of the debitage sample. Flakes not bearing a platform (and too small to identify), and production related shatter numbered 620 specimens. Thus, Structure 218 can be identified as a locus of Postclassic Maya craft activity.

Identification of the type of tool being produced is evident in the recovery of 74 projectile points, 20 of which are unfinished. Of the 20 preform or unfinished points, 6 maintain their original platform, while the total number of points bearing platforms from this structure numbers 11. Nine points have platforms indicative of bifacial thinning (12%), as is evidenced by the presence of diffuse bulbs of percussion. One platform has a thick morphology indicative of blade production, and two dorsal scars run the length of the piece. Lastly, one platform has been modified beyond recognition.

Interpretations

Ethnographic evidence suggests contemporary Maya craftsmen use traditional practices to still produce similar projectile points (Clark 1991). These traditional methods primarily incorporate a blade production trajectory in point manufacture (Clark 1991: 251). However, the existing literature surrounding the production of the Santa Rita projectile point collection has mentioned that the points are characteristically thin (Shafer and Hester 1988: 117) and made on thin flakes and thin blades (Shafer and Hester 1988; Andresen 1976). This thesis demonstrates that the medial thickness of the point sample is 3.23mm (see also Meisner 2014), and maintain an average total thickness of 3.43mm. Thus, this research demonstrates that the characteristic flake types used to produce these points were biface thinning flakes or small prismatic blades, as they are the only flake type which can produce such thin cross sections. Additionally, it has been demonstrated both ethnographically and in this research that the points recovered bear both platform types, indicating their primary reduction practice from both biface thinning flakes and small prismatic blades. This data suggests that, although the points may have been produced utilizing either small blades or thinning flakes as blanks at these two structures, thinning flakes were the preferred blank type, but not the only blank type.

Recovery of bifaces and biface fragments at these two structures further corroborates these findings. Of the 74 biface tools found, only 6 are complete (see Appendix A and B, Table 4). The remaining 68 are highly fragmented specimens, usually represented by only a portion of the original tool, and all show high levels of curation and recycle. Hence, both bifaces and biface thinning flakes played a role in production trajectories during this period, and these trajectories often involved the recycling of old and used forms. In addition to recovering a full reduction sequence, finished and unfinished tools were themselves recovered. Previous research has demonstrated that a production location is identified on the presence of a full reduction sequence (Clark 1994; Moholy-Nagy 1993; McAnany 1989), and both structures fit this scenario.

Structures 216 and 218 both contain ample evidence to support arguments that local chert was used for production. As stated earlier, a workshop is a locus of production which exceeds the needs of its producers (Clark and Bryant 1994: 96; Clark 1989). Although these points are found throughout Santa Rita Corozal, and have been identified in other regions of the Maya Region as well (Meissner 2014), data stemming from these two buildings provides no evidence to support trade beyond local site consumption. This assessment is confirmed by earlier work as well (see Shafer and Hester 1988).

Material Variation

A major research goal of this analysis was to ascertain the level of source material variation within the Postclassic Santa Rita Corozal lithic dataset. Analysis undertaken for earlier periods had predominately identified two materials used in both formal and informal tool production. These two mineral compositions are Colha-like Northern Belize Chert (NBC) (Barrett et al. 2011: 22; Santone 1997; Speal 2009) and chalcedony stemming from various local outcrops in Northern Belize (Chiarulli 2012: 96; Dockall and Shafer 1993: 175; McSwain 1991: 340).

Data garnered from Structure 216 at Late Postclassic Santa Rita Corozal demonstrates a formal tool sample comprised primarily of local cherts from Northern Belize Region of Non-Colha like origin. This tool sample is comprised of 9% chalcedony, 20% Northern Belize Chert, and 60% local cherts. Additionally, obsidian accounts for 11% of the sample of projectile points. Production related debitage recovered in associated contexts demonstrates a similar pattern. Chalcedony accounts for 14% of the sample; Northern Belize Chert and local cherts account for 20% and 66% of the debitage sample, respectively. Thus, data garnered from Structure 216 suggests that tool material acquisition during the Late Postclassic Period had shifted from the patterns of earlier periods.

Source materials recovered from Structure 218 were identified to be similar in pattern to Structure 216. The primary material used in the production of the 74 projectile points found at this building was chert, which accounts for 68% of the total sample. Chalcedony and Northern Belize Chert each account for roughly 16% and 14% of the sample, respectively. Lastly, obsidian at this structure accounts for 1% of the sample.

Debitage analysis undertaken for Structure 218 yielded a finding similar to Structure 216. Once again the primary material is chert, which accounts for 72% of the total sample, while Northern Belize Chert comprises 20% of the debitage sample. Thus, as with Structure 216 (see D. Chase 1988: 54), Structure 218 demonstrates a high status household location of Late Postclassic formal tool production in which the majority of the production material was non-Colha like, Northern Belize cherts. This sample differs from earlier time periods in Maya Prehistory, where the predominant material used for formal tool production was either Colha-like cherts, or chalcedonies (Dockall and Shafer 1993).

Contexts of Point Production

The contexts in which the tools were produced at these locations was also investigated. As previously indicated by the primary investigators, Structures 216 and 218 were high status residences, and likely the home of the family of the *principal* (D. Chase 1986: 365). This assessment was made based on the presence in each structure of intensified caching and burial practices, the presence of more elaborate (multiroom) architecture, and the presence of a shrine or altar (D. Chase 1986: 353-358, 1992:; D. Chase and A. Chase 1988). It can be inferred, then, that the production of this particular tool type at this location represents a high status craft activity. Although it can be recognized that high status households participated in surplus craft production at this site, it is not suggested that craft production of this particular good caused their elevated status. The points are found in less frequency at non-elite contexts at the site suggesting possible local circulation to non-elite contexts from these high status households. In a region and temporal era so firmly situated in a mercantilistic economy, it is proposed that such transactions likely occurred at the local marketplace. It should be noted, however, that although these points were likely exchanged at local markets, production and exchange was not a uniform economic process, and multiple exchange systems were likely enacted during this period.

Lastly, it has been demonstrated that Structures 216 and 218 participated in projectile point production, and many of these points were produced from tools which were used in other crafting and subsistence activities, such as blades and bifaces. Thus, the production of these lithic tools can be linked to the domestic economy of these households. To demonstrate the scale of production which occurred at Structures 216 and 218, a comparison can be drawn to the Postclassic site of Mayapan. In total, Paling (2007) examines a total of 75 similar projectile points reported from all of Mayapan. The amount of points recovered alone from Structures 216 and 218 at Santa Rita Corozal exceeds this number, and previous research has demonstrated that projectile points are far more likely to occur at Santa Rita Corozal than at Mayapan (D. Chase 1992:124). Thus, the recovery of so large a number of points suggests production played a key role in the domestic economy of these households. However, it is not suggested that production exceeded the needs of the site at these two locations, as this style of point is produced throughout Mesoamerica. Furthermore, other households at Santa Rita Corozal undoubtedly participated in projectile point craft production, but at a much smaller scale.

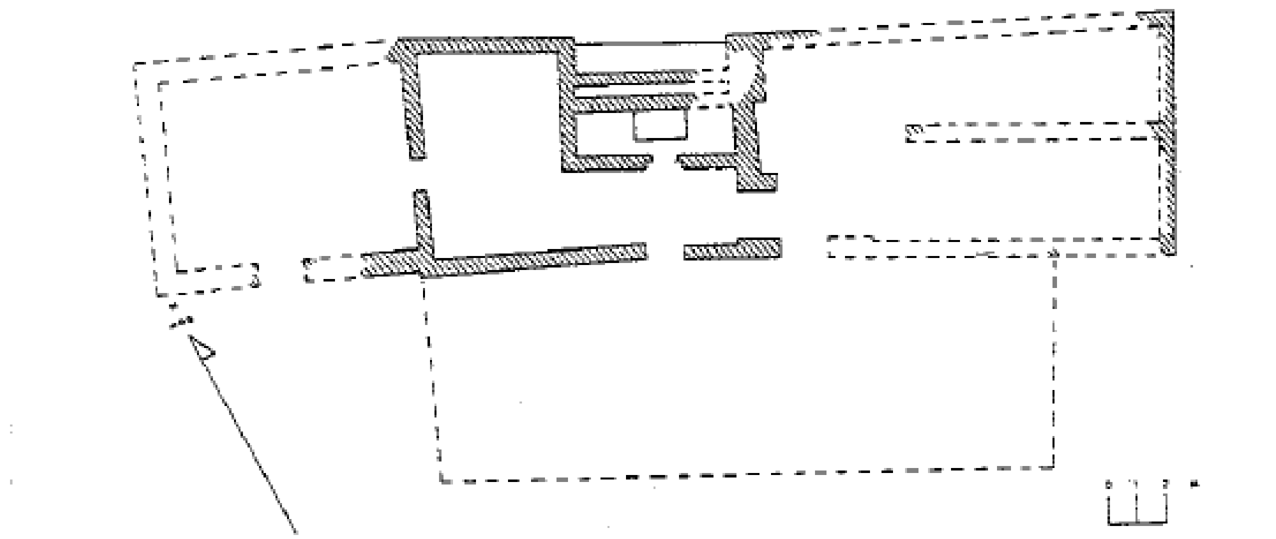

Figure 8: Structure 81, Full Scale Example of Multiroom Building Containing a Shrine

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CHAPTER 6: CONCLUSION

Chert tool production and exchange played an extensive role in Maya economic systems, and helped to create those systems (Braswell 2011: 1). Patterns integral to market based economies, such as production, consumption, and exchange of natural resources and finished tools have been identified in the archaeological literature for earlier time periods in Maya history for the site of Santa Rita Corozal (Dockall and Shafer 1993; Hester and Shafer 1983). Lithic trends of production and exchange, however, during the Postclassic Period of Northern Belize have been less addressed. Data from Late Postclassic Period Santa Rita Corozal, Belize, has been presented to help fill this gap in the archaeological literature.

Analysis of two Late Postclassic Period lithic workshops at Santa Rita Corozal has resulted in three inferences. First, the production of a formal tool type, specifically elongated side-notched projectile points occurred onsite and for local consumption. This projectile point style is found throughout the Maya Region during the Postclassic Period and this pattern of production may have occurred at other Maya centers as well. This pattern, however, is not characteristic of earlier periods in Maya history, where formal lithic tools were generally produced in site centers (Shafer and Hester 1983; Barrett et al. 2011; Santone 1997) and exported to consumer sites (McAnany 1989; McSwain 1991).

Second, the source materials used to produce these tools were comprised of four different minerals. Tool production occurred through the exploitation of obsidian, chalcedony, Colha-like chert, and unknown cherts at Santa Rita Corozal during the Late Postclassic Period. Analysis of debitage and tools recovered from Structures 216 and 218 demonstrate that tool production generally occurred on local cherts. This trend differs from earlier Preclassic and Classic Period lithic production in the Maya region of Northern Belize, when formal tools were primarily made on Colha-like Northern Belize Cherts and informal tools were primarily made on chalcedony (Shafer and Hester 1988: 116).

Finally, this particular formal tool was produced in high status residences at Santa Rita Corozal, demonstrating that high status households participated in craft production activities. Sites in proximity to Santa Rita Corozal, such as Laguna De On and Caye Coco, document similar scenarios in which elites participated in the surplus production of craft items for local markets (Masson 2002:357). At Santa Rita Corozal, given the distribution of projectile points in all kinds of households, a similar exchange scenario may have occurred. Ethnohistorically, large markets and fairs were noted throughout Mesoamerica during this time (Freidel and Sabloff 1984: 190; Tozzer 1941; Feinman and Garraty 2010: 168) and it was marketplace exchange that likely drove this interaction at Santa Rita Corozal.

APPENDIX A:
STRUCTURE 216 FORMAL TOOL AND DEBITAGE TABLES

Table 6: Str. 216 Total Debitage

P33 Total Points and Debitage	
BifaceThinning	246
BTF (No Platform)	22
Blades	43
Macroblade Stems	4
Cortex	104
Unidentified	560
Hammerstones	1
Cores/Core Frags	6
Biface Frags	38
Points and Preforms	36
Total Sample	1060

Table 7: Str. 216 Material Variation

P33 Debitage		%
Chert	679	66.3%
NBCBZ	198	19.3%
Chalcedony	147	14.4%
Obsidian	N/A	N/A

Table 8: Str. 216 Stem Fragments

P33: Stems						
Context	Weight	Length	Width	Thickness	Material	Type
P33B/42	6.4g	18mm	29mm	13mm	Chert	Stem Frag
P33B/6	11.24g	31mm	32mm	10mm	Chert	Stem Frag
P33A/13	17.76g	42mm	26mm	11mm	Chert	Stem Frag
P33B/14-16aa	6.75g	14mm	31mm	16mm	Chert	Stem Frag

Table 9:Biface and Biface Fragments

Context	Biface Frag				Mat	Type
	Weight	Length	Width	Thickness		
P33B/9-1	118.75g	82mm	50mm	29mm	Chert	Complete: Biface/Core
P33A/5	7.48g	39mm	29mm	7mm	NBC	Dart Frag
P33B/42-16	18.89g	31mm	42mm	16mm	Chert	Distal: Celt or Oval Biface
P33B/3-1	14.73g	52mm	32mm	10mm	Chert	Distal: Dart Fragment
P33B/38-2	12.76g	34mm	31mm	11mm	Chalcedony	Medial: Biface Point
P33B/19-4	25.33g	45mm	33mm	14mm	Chert	Medial: Biface Point
P33B/44	10.03g	17mm	41mm	18mm	Chert	Medial: Celt or Point
P33B/10-8a	13.15g	17mm	40mm	20mm	Chert	Medial: Celt or Point
P33B/11-5	10.05g	43mm	32mm	15mm	NBC	Medial: Celt or Point
P33B/42	21.35g	48mm	37mm	14mm	NBC	Mis. Biface
P33B/11-13B	39.41g	40mm	38mm	18mm	Chert	Misc. Biface
P33B/5-5a	19.80g	45mm	33mm	13mm	Chert	Misc. Biface
P33B/48	12.32g	37mm	26mm	14mm	Chert	Misc. Biface
P33B/46-2a	23.09g	40mm	38mm	13mm	Chert	Misc. Biface
P33B/3-11a	14.97g	31mm	30mm	15mm	Chert	Misc. Biface
P33B/12-1a	12.70g	40mm	28mm	12mm	NBC	Misc. Biface
P33B/3-11c	6.27g	17mm	24mm	18mm	NBC	Misc. Biface
P33B/31-4	33.39g	43mm	34mm	21mm	Chert	Proximal: Celt
P33B/11-14aa	37.16g	39mm	40mm	28mm	Chert	Proximal: Celt
P33B/20-5a	61.53g	54mm	45mm	26mm	Chert	Proximal: Celt
P33B/31-2h	7.12g	18mm	31mm	10mm	Chert	Proximal: Misc. Biface
P33B/24-4c	9.78g	38mm	24mm	14mm	NBC	Proximal: Small Celt
P33B/17-12bb	17.12g	24mm	40mm	16mm	Chert	Proximal: Small Celt
P33B/17-11hh	19.98g	45mm	27mm	15mm	Chert	Proximal: Small Celt
P33B/3-3	50.41g	60mm	46mm	15mm	Chert	Proximal: Small Celt
P33B/20-5c	5.75g	36mm	13mm	12mm	Chert	Proximal: Small Celt
P33B/19-9m	4.20g	34mm	15mm	10mm	Chert	Proximal: Small Celt
P33B/3-11b	28.51g	41mm	34mm	18mm	Chert	Proximal: Small Celt
P33B/11-13i	6.12g	12mm	36mm	14mm	Chert	Proximal: Small Celt
P33A/10-6a	11.33g	22mm	35mm	16mm	Chert	Proximal: Small Celt
P33D/5-2	27.42g	42mm	41mm	19mm	Chert	Proximal: Small Celt
P33B/17-12dd	14.42g	22mm	42mm	14mm	Chert	Proximal: Small Celt
P33B/15-21z	19.89g	34mm	33mm	14mm	NBC	Proximal: Small Celt
P33B/1-1d	9.04g	20mm	37mm	15mm	NBC	Proximal: Small Celt
P33B/17-12cc	11.77g	32mm	21mm	14mm	Chalcedony	Stem: Lenticular Biface
P33B/36	8.82g	35mm	26mm	12mm	Chert	Stem: Lenticular Biface
P33B/4-2	12.59g	58mm	26mm	7mm	Chert	Thin Biface
P33A/35-1	64.4g	64mm	42mm	18mm	Chert	Trangular Biface

APPENDIX B:
STRUCTURE 218 FORMAL TOOL AND DEBITAGE TABLES

Table 10: St. 218 Total Debitage

P38 (All)	
BifaceThinning	195
BTF (NoPlatform)	31
Blades	77
Macroblade Stem	7
Cortex	175
Unidentified	586
Hammerstones	2
Cores/Core Frags	32
Biface Frags	34
Points and Preforms	74
Total Sample	1213

Table 11 Str. 218 Material Variation

P38 (Debitage)		%
Chert	800	70.2%
NBCBZ	232	20.4%
Chalcedony	107	9.4%
Obsidian	N/A	N/A

Table 12: Str. 218 Stem Fragments

P38 Stem Fragments: Lenticular Biface or Macroblade						
Field#	**Weight**	**Length**	**Width**	**Thickness**	**Material**	**Type**
P38A/17-2l	22.66g	32mm	23mm	18mm	Chert	Proximal: Stem Frag
P38A/2-10a	30.76 g	38mm	37mm	14mm	Chert	Proximal: Stem Frag
P38B/14-8mm	26.86 g	46mm	36mm	14mm	Chert	Proximal: Stem Frag
P38B/49-7i	19.81g	30mm	38mm	22mm	Chert	Proximal: Stem Frag
P38B/40-11j	17.46g	20mm	24mm	18mm	Chert	Proximal: Stem Frag
P38B/44-8b	11.73 g	21mm	27mm	16mm	Chert	Proximal: Stem Frag
P38B/41-10	24.73 g	35mm	33mm	16mm	NBC	Proximal: Stem Frag

Table 13: Str. 218 Biface and Biface Fragments

Context		Biface Frag				
	Weight	Length	Width	Thickness	Material	Formal/Expedient
P38B/52-3a	22.76 g	22mm	40mm	21mm	NBC	Medial Seg: Small Celt/Formal
P38B/49-4	31.15 g	53mm	36mm	19mm	NBC	Complete-SmallTriangular Biface/Formal
P38B/47-4	39.21 g	57mm	29mm	19mm	NBC	Distal Seg: Small Celt/Expedient
P38A/17-11k	9.51 g	40mm	23mm	12mm	NBC	Distal Seg: Small Celt/Formal
P38B/37-7	41.78 g	44mm	41mm	21mm	NBC	Distal Seg: Triangular Biface/Formal
P38A/18-8c	1.15 g	16mm	19mm	16mm	NBC	Distal: Misc. Biface
P38B/49-6	76.76 g	72mm	55mm	17mm	NBC	Large Oval Biface Medial Frag/Formal
P38B/49-7e	23.79 g	43mm	28mm	22mm	NBC	Medial Frag: Celt/Formal
P38B/52-2b	43.95 g	53mm	36mm	18mm	NBC	Medial Seg: Triangular Biface/Celt/Formal
P38A/18-5b	8.14 g	23mm	23mm	15mm	NBC	Misc. Biface
P38A/20-6g	6.4 g	32mm	25mm	17mm	NBC	Misc. Biface
P38A/6-4i	10.31 g	18mm	25mm	17mm	NBC	Misc. Biface
P38A/8-10c	24.19 g	43mm	30mm	18mm	NBC	Proximal: Possible Stem/Expedient Biface
P38A/18-5f	19.52 g	29mm	25mm	22mm	Chert	Disatal Seg: Small Celt/Formal
P38B/41-6p	15.52 g	29mm	42mm	16mm	Chert	Disatal Seg: Small Celt/Formal
P38A/17-11a	21.78 g	45mm	34mm	19mm	Chert	Distal Frag: Small Celt/Formal
P38A/4-5a	8.75 g	34mm	27mm	18mm	Chert	Distal Seg: Biface Celt
P38B/49-7a	21.55 g	34mm	41mm	18mm	Chert	Distal Seg: Small Biface Celt
P38A/17-2b	8.53 g	22mm	38mm	11mm	Chert	Distal Seg: Small Celt/Formal
P38B/44-5	118.59 g	72mm	66mm	24mm	Chert	Macroflake W/Bifacial retouch
P38B/23-4	32.33 g	37mm	45mm	20mm	Chert	Medial Frag: Celt/Formal
P38B/44-8d	9.64 g	27mm	27mm	18mm	Chert	Medial Frag: Misc. Biface
P38A/18-5d	32.35 g	40mm	42mm	18mm	Chert	Medial Seg: Small Celt/Formal
P38A/24-4d	21.45 g	43mm	27mm	15mm	Chert	Misc. Biface
P38A/21-3	33.32g	35mm	55mm	12mm	Chert	Misc. Biface
P38A/6-5a	3.77 g	23mm	20mm	18mm	Chert	Misc. Biface
P38A/7-5b	3.31 g	18mm	27mm	5mm	Chert	Misc. Biface
P38B/20-6	5.41 g	26mm	23mm	18mm	Chert	Misc. Biface
P38B/7-1a	19.40 g	21mm	40mm	23mm	Chert	Misc. Biface
P38B/18-4	7.62 g	49mm	22mm	6mm	Chert	Misc. Biface/Dart tool Reworkedto Arrow
P38B/21-4	17.18 g	46mm	34mm	10mm	Chert	Triangular Biface Fragment
P38A/5-3	27.25 g	52mm	41mm	11mm	Chalcedony	Complete-SmallTriangular Biface/Formal
P38A/17-2b	15.58 g	32mm	39mm	14mm	Chalcedony	Proximal: Small Celt/Formal
P38A/5-10b	23.50 g	45mm	28mm	19mm	Chalcedony	Proximal: Possible Stem/Expedient Celt

APPENDIX C:
POSTCLASSIC PROJECTILE POINTS-PLATFORMS AND PREFORMS

Table 14: Str. 216 Points and Preforms with Platforms

P33 Preforms		
Preforms	Material	Platform
P33A/48-5	Chert	0
P33B/1-2	Chert	0
P33B/1-21	Chert	0
P33B/14-8b	Chert	BTF
P33B/14-8c	NBC	0
P33B/20-4p	Chert	0
P33B/2-8c	Chert	0
P33B/17-6	Chert	0
P33B/2-8a	Chert	0

P33 Platform		
Field #	Material	Platform
P33A/30-1	Chert	BTF
P33B/14-8b	Chert	BTF
P33B/47-4b	Chert	BTF

Table 15: Str. 218 Points and Preforms with Platforms

P38 Preforms			
Preforms	Platform	Material	NBC
P38A/18-9a	0	Chert	0
P38A/19-3	0	Chalcedony	0
P38A/21-6g	0	Chert	0
P38A/5-7	0	Chert	0
P38A/7-4	0	Chert	0
P38A/8	Modified	Chert	0
P38A/8-7	BTF	Chert	0
P38B/14-14a	0	Chert	0
P38B/14-14b	0	Chert	0
P38B/14-25b	0	Chert	0
P38B/15-3b	BTF	Chert	0
P38B/16-4	BTF	Chert	0
P38B/19-5b	0	Chert	0
P38B/5-4	0	Chalcedony	0
P38B/--8	0	Chert	0
P38C/22-29	0	Chert	0
P38B/14-15d	0	Chert	0
P38A/13	0	Chert	0
P38A/20-6c	BTF	Chert	0
P38B/2-4b	BTF	Chert	1

P38 Platform		
Field #	Material	Platform
P38A/16-5a	Chert	BTF
P38A/20-6c	Chert	BTF
P38A/8	Chert	Modified
P38A/8-7	Chert	BTF
P38B/11	Chert	Blade
P38B/14-15	Chert	BTF
P38B/15-3b	Chert	BTF
P38B/16-4	Chert	BTF
P38B/2-4b	Chert	BTF
P38B/7-6	Chalcedony	BTF
P38B/8-6	Chert	BTF

APPENDIX D:
POSTCLASSIC PROJECTILE POINT TOTALS AND MATERIALS

Table 16: Projectile Points Materials

Point Totals		%
Chert	161	56.3
Chalcedony	38	13.3
NBCBZ	60	21
Obsidian	27	9.4
Total	286	100

Table 17: Point Metrics

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
?	?-7F	Obsidian	0.31	10.34	9.73	2.47
166	P23B/16-2	Obsidian	1.31	32.53	11.87	3.84
167	P34A/10-3b	Obsidian	1.57	26.10	16.90	4.80
179	P34b/3-9	Obsidian	0.82	24.20	11.13	2.96
181	P36a/3-2	Obsidian	3.12	50.20	17.20	3.90
181	P36C/7-16F	Obsidian	1.47	29.47	13.93	3.20
182	P28C/12-5a	Obsidian	1.93	29.99	12.09	4.01
183	P37A/18-7e	Obsidian	2	38.30	15.20	4.10
183	P37A/18-7h	Obsidian	2.01	31.90	13.20	4.30
189	P30C/18-1	Obsidian	2.25	33.52	19.07	4.54
189	P30G(?c)/19-3	Obsidian	1.21	22.86	14.67	2.92
212	P27C/3-1	Obsidian	2.78	26.33	22.17	4.69
213	P26B/25-6	Obsidian	1.93	45.07	14.73	3.16
214	P32B/1-4c	Obsidian	1.2	29.45	13.47	2.82
214	P32c/11-3a	Obsidian	1.77	41.51	14.20	3.06
215	P29B/10-2	Obsidian	3.63	45.77	15.03	4.52
216	P33B/10-6	Obsidian	2.45	38.10	16.60	4.10
216	P33B/17-14	Obsidian	1.42	24.02	13.57	3.66
216	P33B/41-2	Obsidian	1.56	36.20	17.22	2.62
216	P33B/47-6a	Obsidian	1.31	32.32	13.80	3.14
218	P38a/20-10b	Obsidian	2.24	35.24	14.74	3.78
74	P6C/1-9	Obsidian	1.36	33.36	14.96	2.83
77	P6b/7-2a	Obsidian	1.97	40.39	14.52	3.32

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
80	P6g/1-8a	Obsidian	2.86	42.97	15.1	4.68
81	P8a/3-6c	Obsidian	0.98	22.95	11.17	3.78
81	P8c/44-5	Obsidian	6.47	98.84	13.02	4.23
81	P8C/58-2	Obsidian	1.02	28.59	10.2	3.56
77	P6B/1-4s	NBC	3.85	40.13	19.62	3.91
77	P6F/24-4e	NBC	0.87	18.64	13.94	2.41
162	P23A/23-1b	NBC	1.75	18.59	18.15	3.47
216	P33B/10-2	NBC	1.86	35.99	13.48	4.19
216	P33B/14-8c	NBC	4.16	47.26	18.85	4.19
216	P33B/15	NBC	1.11	24.7	12.92	3.44
216	P33B/17-7	NBC	1.85	47.85	9.69	3.27
218	P38B/2-4b	NBC	0.73	16.32	15.24	2.03
156	P18A/55-4	NBC	1.41	36.81	12.07	3.03
160	P19B/14-1	NBC	3.46	41.6	18.15	4.66
162	P23A/7-16	NBC	1.12	29.33	8.51	4.33
166	P23B/22-1	NBC	1	25.27	11.51	3.09
167	P34A/6-8	NBC	1.32	33.83	15.19	2.26
181	P36A/6-6	NBC	1.12	22.91	14.79	3.14
189	P30B/6-2	NBC	0.86	28.29	12.33	2.34
189	P30C/23-14a	NBC	1.37	31.72	11.09	3.76
189	P30C/7-12	NBC	1.87	40.13	13.16	3.8
189	P30D/48-3	NBC	3.75	44.39	17.91	3.65
200	P14b/1-5	NBC	2.9	59.12	9.08	5.28
212	P27B/27-2	NBC	1.94	42.45	14.03	2.72
212	P27B/6-2	NBC	0.89	17.97	14.17	2.58
213	P26A/20-6a	NBC	0.63	35.14	11.23	2.97
213	P26A/27-46	NBC	1.39	29.04	14.01	3.43
213	P26A/27-4a	NBC	2.11	34.96	16.91	
213	P26B/27-2	NBC	0.86	26.31	15.4	2.46
213	P26B/33-9c	NBC	1.49	37.62	13.42	2.34
214	P32C/6-2	NBC	2.81	47.81	14.26	3.66
215	P29B/20-3	NBC	0.62	18.36	10.32	3.3
215	P29B/26-6a	NBC	2.02	39.89	15.74	4.03
216	P33A/16-2	NBC	1.35	27.96	10.77	3.81
216	P33B/2-86	NBC	1.75	29.58	14.71	4.28
216	P33B/3-16	NBC	2.09	33.8	22.9	4.9
218	P38A/17-4b	NBC	1.87	37.01	15.42	3.18

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
218	P38A/23-1f	NBC	0.7	23.78	13.72	2.24
218	P38B/11-11b	NBC	1.2	24.18	11.95	3.67
218	P38B/11-13a	NBC	1.87	40.78	12.51	3.94
218	P38B/14-1	NBC	0.44	16.19	8.47	2.98
218	P38b/14-13	NBC	1.94	19.74	22.75	3.19
218	P38B/15-13	NBC	0.91	27.21	13.22	2.49
218	P38B/17-12	NBC	1.24	25.83	14.04	2.82
218	P38B/29-5	NBC	0.72	15.8	15.24	1.89
218	P38B/43-11	NBC	2.18	28.15	16.59	3.61
35	P10B/8-7	NBC	0.87	24.14	12.81	2.58
39	P20A/35-5b	NBC	1.1	27.77	12.15	2.7
39	P20A/35-5c	NBC	1.39	35.57	14.31	2.45
58	P3A/3-1	NBC	1.03	29.52	12.85	2.69
6	P31A/2-8	NBC	1	20.36	10.2	4.51
6	P31A/3-?	NBC	1.81	33.97	12.72	3.22
74	P6C/1-41	NBC	0.8	25.35	12.19	2.67
74	P6C/1-6	NBC	0.83	19.89	11.55	2.94
77	P6B/6-16j	NBC	0.59	21.6	9.85	3.03
77	P6F/24-3	NBC	0.93	31.61	11.44	2.49
79	P6H/13-2	NBC	1.96	38.42	11.64	3.87
79	P6H/1-8	NBC	0.8	24.82	15.41	1.86
81	P8B/7-3	NBC	1.56	36.5	12.41	3.44
81	P8C/34-3	NBC	0.91	25.19	13.99	2.96
81	P8C/45-11	NBC	2.87	36.08	19.27	3.55
Near 73	P6E/2-12	NBC	2.3	47.11	14.46	2.86
Near 73	P6E/2-4	NBC	3.36	28.83	21.04	5.13
Near 73	P6E/64-8	NBC	3.06	42.85	21.29	
37	P22A/40-1C	Chert	2.7	37.95	17.15	3.67
37	P22A/7-1a	Chert	1.16	23.2	12.2	4.3
39	P20A/12-12f	Chert	1.35	33.42	12.92	3.21
162	P23A/24-2	Chert	2.48	48.16	12.82	3.47
216	P33B/15-22	Chert	2.71	36.06	16.43	3.6
216	P33B/17-6	Chert	2.86	36.97	16.31	3.77
216	P33B/20-4p	Chert	1.79	28.73	15.27	2.86
216	P33B/2-8a	Chert	2.67	36.55	15.07	5.03
216	P33B/45-3r	Chert	1.52	29.48	12.64	4.45
218	P33B/14-8b	Chert	1.44	32.66	13.31	3.44

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
218	P38A/13	Chert	2.28	33.1	17.2	3.94
218	P38A/16-5a	Chert	1.62	27.22	15.11	3.27
218	P38A/20-6c	Chert	0.97	25.65	11.57	2.64
218	P38A/8	Chert	1.95	38.91	10.9	4.11
218	P38B/14-14b	Chert	1.49	27.78	14.17	4.29
218	P38B/14-15d	Chert	2.14	29.46	15.73	4.83
218	P38B/15-3b	Chert	0.65	19.42	12.63	3.81
?	P7A/1-2b	Chert	1.37	41.94	11.05	2.39
159	P19A/15?-6b	Chert	7.74	73.5	20.35	4.64
159	P19A/9-68	Chert	2.31	50.17	11.87	3.69
162	P23A/22-1a	Chert	0.95	20.91	15.3	2.05
162	P23A/26-16	Chert	0.72	20.32	11.48	1.96
162	P23A/27-3	Chert	0.92	25.48	12.7	2.85
162	P23A-7-1c	Chert	0.63	26.92	10.43	2.06
167	P34A/16-1	Chert	2.48	36.24	14.89	3.25
167	P34a/3-3	Chert	0.67	24.66	10.75	2.36
167	P34A/7-8b	Chert	1.98	32.02	14.13	4.33
167	P34A/9-2a	Chert	2.15	35.62	19.89	3.97
179	P34B/22-1	Chert	0.99	21.27	14.86	3.23
179	P34B/26-8	Chert	1.14	25.12	15.97	3.74
179	P34B/27-2	Chert	2.39	33.57	15.06	3.42
179	P34b/30-1	Chert	2.08	43.31	11.12	3.99
179	P34B/33-3	Chert	4.07	48.62	21.89	3.43
179	P34B/3-7	Chert	4.27	31.89	22.91	3.12
179	P34B/4-4	Chert	0.32	17.64	12.32	2.01
179	P34B/7-8a	Chert	0.62	16.46	13.65	2.56
181	P36A/1-6	Chert	0.93	20.84	14.45	2.9
181	P36A/2-9a	Chert	1.74	25.78	14.81	4.02
181	P36a/2-9b	Chert	0.88	9.23	12.01	3.02
181	P36A/2-9c	Chert	1.24	29.07	12.88	4.05
181	P36B/10-4	Chert	1.53	28.56	14.05	3.24
181	P36B/15-1	Chert	1.02	29.05	12.48	3.07
181	P36B/6-6	Chert	2.2	41.33	11.25	4.67
181	P36b/9a-9b	Chert	1.16	26.72	11.53	2.98
181	P36C/23-14	Chert	1.04	30.43	14.17	2.19
181	P36C/9-3c	Chert	2.31	31.98	15	4
181	P36C/9-3e	Chert	0.98	21.57	13.27	3.23

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
181	P36C/9-3r	Chert	1.45	30.79	13.22	4.87
182	P28B/26-6b	Chert	0.33	16.46	9.24	2.46
182	P28C/4-1	Chert	1.48	26.62	12.14	3.19
183	P37A/17-2i	Chert	1.31	26.05	12.64	3.99
183	P37A/18-3	Chert	0.71	21.99	13.62	2.53
183	P37A/5-1	Chert	0.55	22.17	9.76	2.25
189	P30B/20-3	Chert	1.24	27.16	12.71	3.21
189	P30C/19-6	Chert	4.91	48.9	18.2	4.18
189	P30C/20-8	Chert	2.12	28.13	16.06	3.66
189	P30C/25-3a	Chert	2.11	33.2	14.53	3.57
189	P30D/19-1	Chert	0.84	22.75	11.78	3.15
189	P30D/27-2	Chert	1.19	33.89	11.36	2.56
189	P30D/9-36	Chert	0.42	14.74	10.96	2.18
189	P30G/9-1	Chert	0.83	26.83	11.68	2.48
200	P14B/1-4	Chert	1.62	39.86	13.53	2.44
213	P26A/3-4	Chert	0.74	22.02	11.48	3.21
213	P26B/15-1	Chert	1.44	20.8	11.5	3.8
214	P32?B?/4?4?-9b	Chert	0.78	23.35	11.28	2.77
214	P32B/3-46	Chert	2.8	39.26	14.21	4.3
214	P32C/11-1	Chert	1.02	28.37	11.95	2.39
214	P32C/3-16	Chert	1.67	35.51	11.87	3.83
214	P32C/3-1a	Chert	1.62	34.04	9.33	5.06
214	P32C/5-3	Chert	1.72	37.92	11.52	3.99
216	P33A/15-1	Chert	0.9	19.64	11.77	2.86
216	P33A/17-6	Chert	0.31	16.75	8.42	2.54
216	P33A/30-1	Chert	2.08	47.81	10.67	3.84
216	P33A/48-5	Chert	2.41	42.47	16.6	3.2
216	P33A/7-8e	Chert	1.51	31.85	12.6	2.99
216	P33b/11-6	Chert	0.91	31.11	9.97	2.63
216	P33B/1-2	Chert	2.96	31.78	18.88	5.69
216	P33B/1-21	Chert	2.58	41.9	12.91	4.17
216	P33B/15-12	Chert	2.5	50.75	11.78	3.43
216	P33B/15-14	Chert	0.9	20.29	11.72	3.81
216	P33B/15-3	Chert	1.16	23.76	12.52	3.47
216	P33B/19-3	Chert	0.67	19.72	10.89	3.56
216	P33B/2-8c	Chert	1.82	32.86	16.06	3.22

Postclassic Projectile Points: Santa Rita Corozal						
Structure	Lot	Material	Weight	Length	Width	Thickness
216	P33B/47-4b	Chert	1.65	34.45	11.33	3.65
216	P33B/48-36	Chert	1.03	31.84	10.89	2.66
216	P33B/5-15	Chert	1.75	24.44	17.48	4.53
218	P38A/12-3	Chert	0.85	21.03	13.01	2.43
218	P38A/17-10	Chert	0.94	26.85	9.55	2.88
218	P38A/17-13	Chert	4.5	64.53	14.53	3.91
218	P38A/17-4b	Chert	0.81	21.45	13.77	3.13
218	P38A/17-7	Chert	1.4	22.12	14.11	4.07
218	P38A/17-8	Chert	1.71	39.38	11.89	3.73
218	P38A/18-7	Chert		49.54	15.25	4.05
218	P38A/18-8	Chert	1.05	28.19	13.41	2.84
218	P38A/18-9a	Chert	0.84	26.41	13.91	2.44
218	P38A/19-4	Chert	1.55	21.8	16.25	2.86
218	P38A/19-5a	Chert	1.18	24.95	14.74	3.45
218	P38A/19-5b	Chert	0.47	23.48	8.12	2.96
218	P38A/21-6g	Chert	2.57	24.33	19.46	4.38
218	P38A/21-8	Chert	0.71	20.27	12.62	2.77
218	P38A/4-4	Chert	1.16	20.9	12.19	4.79
218	P38A/5-7	Chert	1.36	28.71	13.12	3.46
218	P38A/7-4	Chert	1.73	32.82	12.68	3.25
218	P38A/8-7	Chert	0.93	32.41	10.16	3.59
218	P38B	Chert	0.99	17.04	13.24	3.51
218	P38B/10-3	Chert	1	31.22	13.09	2.05
218	P38B/11	Chert	1.1	24.34	11.84	3.58
218	P38B/11-11a	Chert	0.79	23.91	13.19	2.37
218	P38B/11-14	Chert	0.62	26.69	6.87	2.97
218	P38B/14-10	Chert	1.81	28.55	15.78	2.77
218	P38B/14-14a	Chert	0.94	18.31	12.82	2.43
218	P38B/14-15	Chert	1.38	29.41	9.56	5.28
218	P38B/16-4	Chert	0.66	18.81	11.08	3.73
218	P38B/17-10	Chert	0.67	24.02	9.99	1.8
218	P38B/17-13	Chert	3.34	38.96	18.23	3.48
218	P38B/17-8	Chert	1.23	29.17	13.92	2.69
218	P38B/19-5	Chert	2.12	30.12	17.38	4.32
218	P38B/19-5a	Chert	2.42	43.18	13.67	3.73
218	P38B/19-5b	Chert	0.29	11.07	10.4	2.26
218	P38B/19-7	Chert	0.62	17.65	10.15	3.37

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
218	P38B/26-4	Chert	0.72	18	12.47	2.29
218	P38B/31-1	Chert	1.79	41.29	13.74	3.35
218	P38B/43-10	Chert	1.82	20.32	22.17	4.98
218	P38B/43-9	Chert	0.32	19.89	4.01	2.03
218	P38B/44-9	Chert	2.01	26.05	20.09	2.55
218	P38B/49-9	Chert	0.72	14.15	16.02	2.37
218	P38B/--8	Chert	2.28	44.64	11.34	4.17
218	P38B/8-6	Chert	3.17	47.5	13.83	4.36
218	P38C/22-29	Chert	1.81	29.5	15.37	3.44
35	P10B/4-12	Chert	1.5	24.17	12.94	3.34
37	P22A/40-7b	Chert	0.86	23.26	16.43	2.05
38	P35B/1-23a	Chert	0.97	23.35	13.91	2.59
38	P35B/1-23b	Chert	0.99	18.89	16.01	2.98
38	P35B/25-5	Chert	0.75	26.54	11.37	2.34
39	P20A/28-1e	Chert	1.5	31.15	14.25	2.84
58	P3B/21-7	Chert	1.71	35.06	13.35	3.85
6	P31A/3-4	Chert	0.58	20.79	13.2	1.8
6	P31A/4-7	Chert	2.17	39.86	15.41	3.42
6	P31B/4-16	Chert	0.79	18.5	12.7	2.83
73?	P6H/6	Chert	1.57	24.02	23.92	3.13
74	P6C/1-37	Chert	5.81	62.2	14.55	5.65
74	P6C/1-39	Chert	1.6	36.72	11.73	3.17
74	P6C/1-42C	Chert	2.08	28.01	16.69	3.39
77	P6f/47-1	Chert	0.87	19.45	14.04	2.4
77	P6f/49-2	Chert	3.27	46.5	17.34	3.81
80	P6G/1-7a	Chert	1.17	21.01	15.12	2.62
81	P8A/3-11	Chert	2.94	31.98	27.12	15.31
81	P8B/6-2	Chert	1.04	26.96	9.58	3.24
81	P8C/10-10	Chert	2.47	28.78	18.46	5.21
81	P8C/40-3	Chert	4.43	52.71	13.21	6.09
81	P8C/46-14	Chert	1.65	31.31	13.67	3.53
81	P8C/54-8a	Chert	1.95	46.41	13.36	2.7
81	P8C/9-7	Chert	3.17	54.03	12.65	4.55
Near 73	P6E/1-13b	Chert	1.05	18.7	14.74	3.25
Near 73	P6E/1-13c	Chert	1.94	32.51	14.32	3.38
Near 73	P6E/42-3	Chert	2.85	28.98	19.57	3.65
Near 73	P6E/47-3	Chert	0.58	21.1	7.5	2.92

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
Near 73	P6E/5-3a	Chert	1.99	25.02	20.78	2.58
Near 73	P6E/54-6	Chert	0.44	15.61	8.09	3.16
Near 73	P6E/64-1q	Chert	0.62	21.95	10.32	2.81
Near 73	P6E/9-8	Chert	1.4	27.07	15.57	3.3
213	P26B/33-9b	Chalcedony	0.99	23.12	11.07	3.19
216	P33B/4-7j	Chalcedony	2.69	40.42	15.05	3.77
218	P38B/5-4	Chalcedony	2.15	32.07	16.75	3.39
160	P19B/11-4	Chalcedony	0.83	24.77	11.62	2.75
167	P34A/9-25	Chalcedony	1.76	28.71	13.03	4.53
189	P30C/25-3a	Chalcedony	1.34	30.44	14.58	2.85
189	P30C/3-60	Chalcedony	2.98	41.03	17.56	3.23
213	P26A/13-9	Chalcedony	1.09	39.36	11.36	2.63
213	P26A/20-6b	Chalcedony	1.09	25.71	14.05	3.03
213	P26B/33-9a	Chalcedony	2.11	32.39	13.51	4.77
213	P26B/3A-6	Chalcedony	1.44	38.78	13.2	2.5
213	P26B/6-1	Chalcedony	2.18	34.07	13.19	4.01
216	P33B/35-2	Chalcedony	1.02	30.31	12.8	2.84
216	P33B/47-46	Chalcedony	2.22	32.54	13.02	5.95
218	P38A/18-9b	Chalcedony	2.71	37.79	13.02	3.69
218	P38A/19-3	Chalcedony	0.64	20.45	11.34	2.21
218	P38A/20-8	Chalcedony	1.27	21.41	14.08	3.81
218	P38A/21-9	Chalcedony	2.02	34.69	15.84	3.72
218	P38B/10-4	Chalcedony	3.61	30.01	22.31	4.92
218	P38B/11-13b	Chalcedony	1.26	25.68	10.87	3.22
218	P38B/14-15c	Chalcedony	1.01	21.88	14.48	2.42
218	P38B/14-25b	Chalcedony	3.03	46.48	14.08	4.22
218	P38B/44-10	Chalcedony	4.46	37.52	17.8	6.1
218	P38B/4-5	Chalcedony	2.27	39.92	16.87	3.04
218	P38B/7-6	Chalcedony	1.6	28.01	14.32	3.03
58	P3A/3-1	Chalcedony	1.84	26.07	16.95	2.98
58	P3B/3-6	Chalcedony	0.69	26.67	10.31	2.29
6	P31D/5-3	Chalcedony	2.1	28.88	17.45	3.32
7	P2F/4-46	Chalcedony	1.01	27.56	14.54	2.51
74	P6C/40-4	Chalcedony	2.96	39.91	16.31	4.13
77	P6F/1b(?)-1	Chalcedony	1.01	35.86	10.81	2.26
77	P6f/31-3	Chalcedony	1.54	37.02	13.26	3.01
79	P6h/1-3	Chalcedony	2.28	41.41	14.11	2.95

Postclassic Projectile Points: Santa Rita Corozal						
Structure	**Lot**	**Material**	**Weight**	**Length**	**Width**	**Thickness**
79	P6h/7-3	Chalcedony	1.46	36.35	11.52	2.92
80	P6G/1-11	Chalcedony	1.63	29.83	14.77	3.82
81	P8C/34-4	Chalcedony	1.17	29.31	13.15	3.15
81	P8C/4-3	Chalcedony	1.61	28.22	11.35	4.41
Near 73	P6E/4-6	Chalcedony	1.98	35.91	12.65	3.85

APPENDIX E:
ILLUSTRATION PERMISSION I

RE: Image reproduction request
Diane Chase

Sent: Monday, November 17, 2014 9:59 PM
To: marcd [marcd@knights.ucf.edu]; Arlen Chase
Attachments:

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-----Original Message-----
From: marcd [mailto:marcd@knights.ucf.edu]
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To: Arlen Chase; Diane Chase
Subject: Image reproduction request

Good Evening,

I am finishing the formatting on my thesis "Chert Tool Production and Exchange at Two Late Postclassic Coastal Maya Households" at the University of Central Florida. I was wondering if you would grant permission to reproduce the figure listed below. It is the plan drawing of Structure 81 from Santa Rita Corozal, an example of a Late Postclassic multiroom palace containing a shrine.

Chase, Diane Z. and Arlen F. Chase
2004. Santa Rita Corozal: Twenty Years Later. Research Reports in Belizean Archaeology 1: 243-255.

Page	Figure
245	1

All I need is an e-mail acknowledgement to include in the appendix of the thesis. This is to meet requirements of the Graduate School at the University of Central Florida, and to comply with ETC (Electronic Theses and Dissertations) guidelines as stipulated by Proquest.

Thank you,
Marc Marino

APPENDIX F:
ILLUSTRATION PERMISSION II

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From: marcd [mailto:marcd@knights.ucf.edu]
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To: Diane Chase
Subject: Image reproduction request (2nd image)

Hello Dr. Chase

I am finishing the formatting on my thesis "Chert Tool Production and Exchange at Two Late Postclassic Coastal Maya Households" at the University of Central Florida. I was wondering if you would grant permission to reproduce the figure listed below. It is the full plan drawing of Structure 81 from Santa Rita Corozal, an example of a Late Postclassic multiroom palace containing a shrine.

Chase, Diane Z.
1985. Ganned But Not Forgotten: Late Postclassic Archaeology and Ritual at Santa Rita Corozal, Belize. In The Lowland Maya Postclassic, edited by Arlen Chase and Prue Rice, pp. 104-125, University of Texas Press, Austin.

Page Figure
111 6

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Marc Marino

APPENDIX G:
ILLUSTRATION PERMISSION III

Re: Image reproduction request
Arlen Chase
You replied on 11/17/2014 10:55 PM.
Sent: Monday, November 17, 2014 10:42 PM
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Good Evening,

I am finishing the formatting on my thesis "Chert Tool Production and Exchange at Two Late Postclassic Coastal Maya Households" at the University of Central Florida. I was wondering if you would grant permission to reproduce the figure listed below. It is the plan drawing of Structure 81 from Santa Rita Corozal, an example of a Late Postclassic multiroom palace containing a shrine.

Chase, Diane Z. and Arlen F. Chase
2004. Santa Rita Corozal: Twenty Years Later. Research Reports in Belizean Archaeology 1: 243-255.

Page Figure
245 1

All I need is an e-mail acknowledgement to include in the appendix of the thesis. This is to meet requirements of the Graduate School at the University of Central Florida, and to comply with ETC (Electronic Theses and Dissertations) guidelines as stipulated by Proquest.

Thank you,
Marc Marino

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