TOWARD AN ITINERARY OF STONE: INVESTIGATING THE MOVEMENT, CRAFTING, AND USE OF OBSIDIAN FROM CARACOL, BELIZE

By

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To my late father, Richard T. Johnson;
to my family for their enduring support, encouragement, and optimism; …

…and to all those who helped to recover, protect, catalogue, and curate artifacts from Caracol, Belize

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By

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This dissertation explores the movement, transformation, and use of obsidian artifacts from the Classic Maya city of Caracol, Belize during most of its occupational history (ca. 300 BC - AD 900). Through a comprehensive approach, including geochemical sourcing and lithic technological analysis as well as contextual and distributional data, the research reconstructs and traces various disparate, yet interconnected regional and local "object itineraries." Obsidian sourcing using handheld portable X-Ray Florescence and flake stone analysis assesses the regional pathways and sources/forms of obsidian before it entered Caracol. Inferred local obsidian craft production and material transformation (i.e., reconstructing reduction sequences), including workshop maintenance and the curation of obsidian debitage and exhausted blade-cores for later ritual use, is addressed through an aggregate analysis of various contextual assemblages. Internal exchange mechanisms (e.g., markets) are understood through a detailed distributional analysis of all obsidian artifacts (not just blades). Contextual analysis of various household deposits demonstrates that different kinds of obsidian objects were used for specific purposes. These varied purposes (i.e., quotidian

and ritual) help to inform the pace at which households interacted with markets and the potential exchange of knowledge and practice between crafter and consumer.

Obsidian distributional patterns demonstrate that although some elite control over resources likely occurred, obsidian was accessible by most people regardless of status. Through contextual and technological artifact associations, residential use and deposition become relatively predictable, thus allowing stronger inferences to be made regarding the nature of exchange in commodities, knowledge, and a shared ritual tradition across a broad city-scape. The work concludes by situating the (re)production in aspects of household identity and the potential social meanings of obsidian by enchaining (1) Caracol's regional connectivity and broader obsidian circulation; (2) the varied social relationships that likely occurred at local markets; (3) the materially transformative aspects at inferred local obsidian workshops and the segregation of consecutive stages within blade-core reduction strategies; and (4) household quotidian use and the ritualization of varied obsidian forms. Through an itinerary approach, the flaked stone data from Caracol highlight the ways that obsidian pervaded much if not all aspects of ancient Maya life.

CHAPTER 1
INTRODUCTION AND DOCUMENT OUTLINE

This work presents a technological, elemental, distributional, and contextual analysis of more than 17,000 obsidian artifacts from the ancient Maya site of Caracol, Belize (Figure 1-1). The main goal is to show that obsidian was an essential material for the social reproduction of Caracol's population. Here social reproduction refers to the implications derived from the evidence that nearly all of Caracol's inhabitants were able to obtain and use obsidian in their daily lives as well as during historical, eventful rituals. Wide spread continued provisioning and use helps to show just how alike most residential practices were and that these practices endured for multiple generations.

Additionally, obsidian was a non-human material that moved, that followed certain pathways, and that was part of a human network of situations that ultimately aided in defining an ancient Maya identity both regionally and locally. Through exploring and working toward this *itinerary* of obsidian (see Hahn and Weiss 2013; Joyce and Gillespie 2015), I reconstruct a network of social, historical, and physical relationships. To be sure, the network that is explored through the itinerary of obsidian may have been established and coexisted alongside broader exchange relationships involving other material classes (e.g., ceramics, jadeite, and shells) or artifact types (e.g., manos and metates). Despite the exclusion of researching other materials, the movement and exchange of obsidian was indeed vast and included many actors.

Obsidian was embedded in daily and ritual life and may have embodied a cycle of life and death. In many ways, obsidian as it moved from quarries through regional exchange networks - to then be locally crafted, used, and deposited, constructed - reaffirmed notions of ancient Maya identity and personhood. Obsidian in these ways was an active non-human player in a process that reproduced ancient Maya domestic, ritual, and political economic life.

Figure 1-1. Overview of Mesoamerica, regional areas, location of Caracol, and important sites of Classic Period obsidian research mentioned in the text.

Obsidian had a socially and physically transformative life as it moved between places with the aid of human agents. Studies of obsidian offer an opportunity to study multiple places or stages along an itinerary while reconstructing a vast network of social relationships. Obsidian can be sourced to known quarries by recording and analyzing its unique geochemical signatures. Both crafting and household activities left macroscopic (and microscopic) traces on glassy surfaces. And potential meanings of certain artifact types for the ancient Maya may be indexically linked with their archaeological context.

Like human biographies or life-histories, obsidian had an origin place (e.g., a quarry) – or a birth place – and a place of rest (e.g., depositional context) – or a death place – but unlike human biographies, obsidian *itineraries* were not necessarily linear, but could be fractal, fragmentary, and traverse different temporal and spatial trajectories. As I will argue, some obsidian objects may have had long periods of stasis prior to being deployed in rituals, thus introducing temporal components to craft production practice and workshop maintenance. Obsidian can be broken apart through knapping practices or through intentional or unintentional breakage. Analysis includes these separate pieces as they follow different paths or stay together as indicated by a contextual and distributional analysis. They can be re-cycled or transformed into other objects as they moved. In a way, situating a study of obsidian within an itinerary approach compliments a rigorous chaîne opératoire approach.

Obsidian is a durable material that does not break down in an archaeological context. (Its itinerary continues even through this research and the production of knowledge about the ancient Maya past.) Obsidian itineraries could be punctuated depending on various human projects they enabled and maintained. As I will demonstrate, obsidian objects were continually being negotiated as people prepared, conducted, or resolved daily tasks and ritual events. Thus obsidian, like other durable materials was an important economic commodity and a frequently ritualized material because of its importance in everyday life.

The broad flow of this document is designed to guide the reader through a series of itineraries (see Hahn and Weiss 2013; Joyce and Gillespie 2015) – moments and times in an object's movement and enrollment in human projects – while also providing a model for obsidian exchange explored using archaeological data. By reconstructing obsidian's itinerary from known archaeological contexts, distributions, technological attribute analysis, and an elemental sourcing study, the research focuses on specific moments and places in the overall movement and transformation of obsidian from quarries to various archaeological contexts.

The movement of obsidian can be modeled at two general levels that includes a variety of places and human agents. The first level, research aims identify and trace obsidian from various quarries to depositional contexts within Caracol (Figure 1-2). Obsidian from particular sources could have passed through other sites prior to arriving at local workshops and/or locations of exchange within the city (i.e., for redistribution), perhaps from prior obsidian workshops. In this model, research can test whether or not obsidian crafts could have moved from various locations (e.g., other sites, local workshops) – in various forms (e.g., blades, biface, tools, eccentrics) – through marketplace or non-marketplace exchange mechanisms before use and deposition at monumental architectural in Caracol's city center and/or at smaller sized household groups throughout the 200sqkm mapped settlement area (A. Chase and D. Chase 2016). Analyses of various broad depositional contexts and their distributions are employed to help operationalize how and in what form obsidian was most commonly used and deposited. Distributional analysis will provide a measure of how widely obsidian objects circulated and argue through what type(s) of exchange mechanism. These four contexts – refuse construction fills, burials, and caches – are described and justified below as I summarize the obsidian research objectives and questions at Caracol, Belize. In the contextual analysis (see Chapters 5 and 7), refuse and construction fill contexts are lumped into a single contextual category – *refuse/fill* –

because in many cases architectural construction fills have yielded substantial refuse deposits (Johnson et al. 2015). Many of these refuse deposits that are incorporated into the construction fill of structures have contributed to a more detailed understanding of household lithic production for extra household distribution (Johnson 2008; Pope 1994).

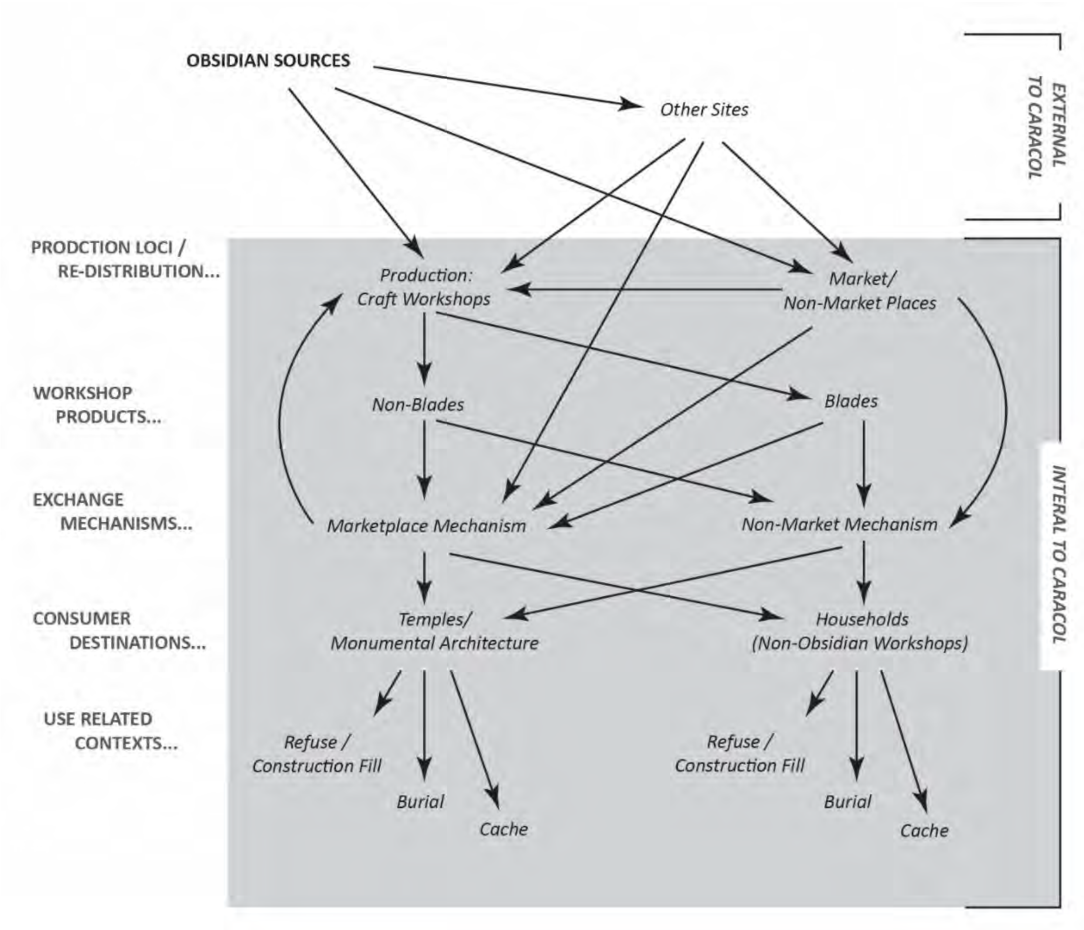


Figure 1-2. A model for obsidian movement as it relates to research at Caracol, Belize.

At the second level, research assesses the movement and transformation of obsidian by focusing on workshop crafting strategies in the reduction or transformation of obsidian into formed and shaped objects. When obsidian arrived at local crafting workshops, obsidian was transformed into two broad technological categories: blades and non-blades. Traditional models follow an idealized reduction sequence or *chaîne* *opératoire* for the production of blades and the associated non-blade debris (e.g., macro pieces, rejuvenation debitage, exhausted cores) for producing blades. Additionally, these same reduction sequences focus on the technological *strategies* of blade production and the kinds of objects (i.e., reduction debitage, rejuvenation debitage, and exhausted cores) to determine if variations in production strategies existed (Hirth and Andrews 2002).

Separate research then assesses how obsidian was distributed to consumers. Distributional studies typically focus on control and access to blades specifically (see Aoyama 1999) whereas this research will trace the distribution of all obsidian objects. Obsidian research at Caracol does adapt previous reduction organizational models and definitions (see Hirth 2006), but differs by highlighting the flexibility or fractal nature of other *non-blade objects* also moving out from workshops to consumers for various purposes. Non-obsidian crafting consumers may have used specific (retouched) obsidian forms or stages in the reduction sequence differently (Hruby 2007). For example, was macro debitage, rejuvenation debitage, and/or exhausted cores curated at workshops with the explicit intent to later use these as domestic tools or perhaps deploying them in rituals? Therefore, the organizational scheme employed in this research is technological, temporal, and contextual while considering any obsidian object, not just blades, as they may have been used in daily or ritual practice.

Each place (e.g., quarrying, moments along a trade path in route to workshops or sites, and further movement to local consumers) is discussed with the intention of establishing specific relationships among objects, people, places, and times during different, yet connected, moments in an object's itinerary. For example, through an analysis of crafting obsidian – that includes the reduction of raw material to produce blades and other related obsidian objects – what relationships and knowledge did crafters have in order to procure raw materials and make highly standardized blade tools and ritualized objects like eccentrics? Can we determine who they communicate with in order to obtain raw materials? Or determine where might these communications have taken place? What was the history and nature of these relations? In terms of actual transformation of raw materials, what skills did individuals or apprentices have to learn to become crafters? Who were their crafts intended to provision? Who did crafters possibly cooperate/communicate with to facilitate provisioning? Although some of these queries are beyond the scope of this work, many are explored within and are intended to position obsidian research within broad areas of socially important issues.

The places and contexts that are presented in this document have been selected to present a relational and inclusive study of the organization of a lithic industry where questions like the above are posed to better understand how obsidian was embedded in everyday life and the production of a Caracol identity. Another aim is to situate obsidian crafters at Caracol in the context of social relations among Caracol's broader population. I intend to demonstrate how obsidian was used by nearly everyone at Caracol for daily and eventful practices. Because this is a broad research objective, the project attempts to study obsidian at Caracol from specific archaeologically investigated contexts that have shown to be important moments in the use, movement, and transformation of obsidian. This should enable a more informed discussion of the role of crafters and of obsidian in the ancient Maya past. These contexts are summarized below as well as a summary outline of Chapters 2 through 9.

Outline of Chapters: Chapter 2 situates the research within an "itinerary approach." This approach forms the fundamental framework and the scalar nature of the dissertation's organization. In order to utilize the approach, I will review various aspects that have inspired this burgeoning and divergent approach from that of "life-history" and "object biography." The theoretical framework is articulated with a discussion of methods useful in exploring the movement and transformation of obsidian and by reconstructing the pathways or routes that obsidian traveled which then provide an opportunity to reveal and discuss dimensions of ancient Maya social life.

Chapter 3 reviews the site of Caracol, Belize and presents a broad understanding of Caracol by which to situate the current obsidian research project. In the subsections of this review specific research questions are posed. For example, the broad settlement of Caracol is described followed by background literature to situate Caracol's political economy in the region. The importance of Caracol in the region is viewed by discussing the breadth of materials coming in and flowing through the site and questions address the particularities of obsidian importation.

This is followed by an understanding of the organization of the local economy and exchange as seen through current research on local marketplace exchange during the Classic period (A.D. 250-900). These more macro-level concerns then transition into what is currently posited regarding the organization of craft production, specifically concerning multi-crafting and the potential identities of flaked stone specialists. This identity is viewed through shared production practices. Finally, a broad discussion of ritual practices at the site is described. Ritual at Caracol is a complex topic to synthesize completely; therefore, the discussion is presented through a summary of materials and places that were continually ritualized at particular architectural structures (e.g., eastern residential shrine buildings).

The goal of this type of review is to simply describe the regular and often predictable associations certain materials share with ritualized spaces. It is not intended as a grand narrative regarding ancient Maya ritual, but rather a directed review that is based in a materials contextual analysis.

Chapter 3 also provides a brief presentation of the obsidian collection as it was known prior to this research project. A summary of a series of citations to Caracol's obsidian is presented. Most of these references pertain to the use of obsidian in various residential rituals, while others describe larger, more numerous obsidian deposits associated with city center burial-tomb chambers. After this short review, the exclusions and limitations of the research is presented. This is done with the explicit intent of considering any bias in the data and to address any sampling issues that might affect interpretations. Exclusions in the research are also specified and justified. For example, I will not attempt to relate each obsidian object/assemblage to other material objects or assemblages in every case; the catalogue is simply too complex for a dissertation project. This project does, however, help to initiate such a project by assembling all the obsidian data collected over the 32-year project history and relating them in a digital catalog to their locational, contextual, and temporal context. Once these relationships are understood, further studies can then target specific objects and their assemblages in certain contexts at particular times. As I wrote this work, other artifacts were being recovered and paper records were being entered into a master digital database system.

Chapter 4 discusses obsidian *handheld portable energy dispersed x-ray* *fluoresce* (or *HHpXRF* hereafter) sourcing from Caracol, Belize. I present findings from 1,768 assayed artifacts. The selection of this 10% sample was design to understand the various sources and forms that moved into Caracol, and also to explore any chronological changes in resource exploitation/importation into Caracol proper. This sample is comparable to other sourcing studies in the Maya area (Moholy-Nagy et al. 2013). Sourcing obsidian artifacts to particular quarries also underscores an understanding of the starting stage and location(s) in an itinerary and enables Caracol to be connected to the ancient regional obsidian exchange landscape. Recent models have excluded Caracol, but now data are available. I present the chronological importation of obsidian into Caracol as well as discuss the synchronic distribution at recovery contexts. I will show that these two dimensional data will allow for a broad understanding of obsidian trade patterns, internal site exchange mechanisms, and (now that data from Caracol are available) a revisiting of existing regional models.

Chapter 5 contends with what happens to obsidian as it moves into craft production workshops. This chapter follows importation because issues of crafting organization and reduction technique(s) are the next stage along obsidian's itinerary before being circulated to households through some local exchange mechanism(s). Chapter 5 serves two broad purposes. First, it presents the analytical schema used to re-evaluate the bulk of obsidian from Caracol (see Table 1-1 for a summary or findings) and thus provides a standard for future laboratory analyses of Caracol obsidian. This scheme is adapted from other obsidian studies in an effort to create commonalities and comparative criteria between the Caracol collection and other research projects (Aoyama 1999; Clark 1997, 1998; Clark and Bryant 1997; Clark and Lee 1979; Hirth

2006; Hruby 2007; Trachman 2002). A major hurdle of this project is to standardize the analysis and implement analytical conventions in order to build the dataset after each field season. Previous scholarship has critiqued the use of non-standard or less than transparent analysis schema (Clark 2003:23). Therefore, I have made every effort to make artifact analysis transparent by providing technical definitions and images. It is worth restating, the analysis strategies and definitions are adapted from previous research to create continuity and comparability. I show the reduction strategies used by crafters to produce or transform obsidian into objects for consumers. Therefore, knowledge and technique of crafters is discussed in terms of prior research.

Table 1-1. Summary of analyzed obsidian artifacts from Caracol, Belize.

Technological Stage/Type	n=	% of Analyzed	% of Total
Percussion: Core Shaping	1,780	9.96	9.11
Macro	418	2.34	2.14
Small Percussion	1,362	7.62	6.97
Pressure: Blade Production	10,832	60.64	55.42
Initial Series	4,008	22.44	20.50
Final Series	6,791	38.02	34.74
Other	33	0.18	0.17
Rejuvenation: Core Maintenance	2,139	11.97	10.94
Core-Tops	203	1.14	1.04
Core-Sections	100	0.56	0.51
Platform Prep.	1,193	6.68	6.10
Distal/Lateral	592	3.31	3.03
Other	51	0.29	0.26
Blade-Cores and Frags	749	4.15	3.80
Non Blade-Core Related Objects	54	0.30	0.28
Undiagnostics	2,314	12.97	11.85
Total Analyzed	17,868	100	91.38
Total Unanalyzed*	1,724	-	8.82
Total Recovered**	19,592	-	100.00

*Unanalyzed sample explained in Chapter 3; **as of 2015

Second, Chapter 5 also summaries the importance of artifact contextual analysis and distributions to introduce shared access of particular obsidian objects and their contextual associations. In order to accomplish both of these goals, I present the raw analysis criteria with definitions, counts, percentages, and weights as well as a preliminary contextual analysis for each broad reduction technique by artifact type. For example, the reduction sequence or *chaîne opératoire* of obsidian blade production begins by presenting macro-core shaping percussion techniques. The subsequent subsections deal with more fine pressure techniques, percussion core rejuvenation techniques, and finally with percussion strategies to destroy, terminate, or decommission exhausted cores. Each stage is presented and then a discussion of their contextual distributions is described. These contextual associations and the probability or t-test distribution ($p = 0.05$) of recovering certain technologies from particular contexts is presented as background for Chapter 8 that contends with both ritual and quotidian uses of obsidian at Caracol.

Unlike other sites where workshops have been found (Neives and Libby 1976; Olson 1994), no obsidian workshop has yet been located at Caracol, so the construction of a detailed *chaîne opératoire* is a result of understanding an aggregation of multiple assemblages. Through this analysis, substantial evidence of local obsidian working is evident even though no workshops are currently known. It is important to note here that investigations at Maya sites rarely expose obsidian workshops and only a few studies expose primary refuse associated with workshop activities (see Olson 1994). The bulk of research on the organization of ancient Maya obsidian blade production is derived from detailed analyses of secondary ritualized contexts like those presented in this document (i.e., deposits associated with vaulted tombs, other burials, or caches) or other less ritualized contexts (i.e., test excavation units adjacent to residential architecture). For example, I will discuss the details of obsidian reduction to produce blades as evidenced from two of the three burial contexts in Caracol's city center. Both of these context date to the Classic period, so the bulk of materials to infer production practices are controlled temporally. Similar contexts have been investigated from sites such as Tikal (Moholy-Nagy 1994, 1997) and Dos Hombres (Trachman 2002). I draw broad interpretations at the end of Chapter 6 by making comparison to other studies of crafting organization to determine if obsidian crafters at Caracol reduced obsidian with similar or significantly different reduction strategies.

Chapter 6 diverges from technological descriptions and the preliminary contextual associations (which is taken up again in Chapter 8), to contend with how obsidian moved from the crafting workshop to the broader population. This is done through mapping and interpreting the site wide distributions of the technologically distinct artifact types described in Chapter 6. Which households had access to blades, cores, points, or the like? And how much was accessed in comparison to other kinds of flaked stone used as tools? Essentially, I show how the bulk of obsidian moved through markets at Caracol to create a pattern of relative equality of access. This is supported through three tested hypotheses. It is important to note that markets have been argued to exist prior to this research (see A. Chase 1998; A. Chase and D. Chase 2001), so a goal herein is to test whether or not markets influenced the distributions of obsidian rather than to test for the presence of markets. Before theses interpretations can be made, however, I review the appropriate literature and discuss some of the lingering, yet important concerns, over whether or not the ancient Maya possessed markets for local or regional exchange. This chapter is also situated strategically because the local exchange mechanism is the next stage in the movement of obsidian out of workshops into the hands of consumers. It also foreshadows and lends evidence to show how important obsidian crafters were to the local markets and those who obtained blades and other obsidian goods used in household settings. Although markets appear to be critical for provisioning households at Caracol with goods, I do introduce the likelihood of more interpersonal exchange mechanism between crafter and household by beginning my discussion of the ritualization of obsidian in caches and burials.

Chapter 7 presents obsidian data from household quotidian deposits (i.e., refuse/construction fills), burials, and caches. These four broadly defined depositional contexts represent a next stage in the itinerary of obsidian which occurred after procurement of obsidian from a market or possibly some other non-market interaction. Refuse and construction fill discard locations are evidence for domestic tool use and not necessarily evidence of ritual behavior. Construction fills (which can include secondary deposits of domestic refuse) make up the bulk of areas excavated during residential archaeological investigations and most often is the matrix that surrounds burials and caches. This matrix is therefore likely made up of redeposited domestic refuse to add volume to structures during initial construction or additional modifications. In some cases, particular structures went through regular modification that corresponded with calendrical or death related events (A. Chase and D. Chase 2013; D. Chase and A. Chase 2011; Johnson et al. 2014). Therefore, modifications can be timed and likely occurred over multiple generations at a single residential dwelling (see also A. Chase and D. Chase 2013). Fill is required to cover older surfaces, and add volume and footing for new ones. In addition to these types of matrices, refuse can also occur on floors of some building. Vacant terrain excavations may also recover refuse deposits adjacent to residential structures. The amount of obsidian from refuse contexts, as well as ritual contexts, contributes to a quantitative analysis of domestic consumption.

The ritualization of obsidian in burial and caches at households is presented separately from daily tool use later in the same chapter. Burial and cache contexts are those deposits that are situated within or situated next to construction fill areas and redeposited domestic refuse recorded during excavations. These contexts can be defined as social events different from the everyday and/or intentional deposits that often yield dateable materials.

Chapter 8 concludes the work by stating that, while research on previously collected artifact assemblages can be difficult to situate in current models and theories of exchange or the social organization of craft specialization, there is much knowledge to acquire from an approach that is as comprehensive as possible – that follows obsidians from quarries to consumers. The study demonstrates the importance of obsidian for the ancient Caracol Maya and how crafters helped to integrate the local economy through their knowledge and socioeconomic connections via markets and inter-personal relations. Through an itinerary approach I contend that obsidian for the Maya at Caracol, and arguably other sites, pervaded many parts of life. Ancient peoples were dependent on the obsidian crafts as much as on those who produced them. I summarize by explaining that through my analysis the network of relations that the crafter and their crafts were involved in aided in reproducing daily and ritual life. Crafters provisioned households with materials they needed to reproduce household ritual traditions as well as their quotidian practices. Unlike other studies, this project views crafters and those consuming crafts as part of a collective where communication and cooperation is given priority as opposed to models were hierarchical power was employed. Prior research at Caracol provides support for this cooperative and integrative model (A. Chase and D. Chase 2009). Power relations influenced ancient Maya economics, politics, and rituals, but at Caracol a different picture continues to emerge where sharing and integration appears to be omnipresent in much of daily and ritual life.

CHAPTER 2
THEORY AND METHOD

Below I review complementary approaches (i.e., life-history, object biography, and itinerary) that guide this research and positions the following analyses of obsidian within a broader conceptual framework. After a concise literature review, a model for obsidian movement and transformation is outlined. This proposed model confronts obsidian at various stages (or segments) along its itinerary and in so doing highlights various human relationships and behaviors. Joyce (2015:29) explains that, “Itineraries are the routes by which things circulate in and out of places where they come to rest or are active.” Hahn and Weiss (2013:8) state in an earlier publication that, “…the notion of an itinerary highlights the non-linear character of an object’s mobility and the subsequent changes in its contexts and roles.” This research, while employing various methods of analyzing obsidian artifacts to understand ancient Maya economics, politics, domestic activities, and ritual practices, also attempts to imagine the route by which obsidian traveled and was transformed. Transformation can refer to physical changes as well as changes in social meaning, value, or relevance in society.

Obsidian possesses many unique properties that afford, facilitate, and enable it to be active in multiple places during human lives both in the past and present. Through analyses of multiple properties or attributes (e.g., color, elemental composition, and formed shape) archaeologists can understand aspects of human behavior via obsidian (see Schiffer 1999; Skibo and Schiffer 2008). Some properties are useful to determine procurement habits from specific geochemical sources, while technological attributes help archaeologists understand how skilled (or unskilled) flint knappers transformed raw materials, through subtractive methods, into usable and very sharp tools. These formed objects could be traded with others or used by their makers for a variety of tasks. There are numerous examples of these studies, but the dynamic being introduced here is that obsidian geochemical (or visual), spatial, and technological analysis has the ability to reconstruct certain relationships humans had with their geologic landscape, other trade partners, as well as to describe aspects of crafting knowledge critical for the reduction of stone into formed objects. The movement of obsidian artifacts can link together places, people, and activities as well as inform human behavior.

After sourcing obsidian and assessing the archaeological (or cultural) context, at least two stable points along a route can be plotted in the movement of stone. According to both life-history and object biography approaches (Gosden and Marshall 1999; Joy 2009), the source can represent a beginning, an origin, or a birth place and the archaeological recovery context an ending point or a death. For example, finding obsidian blade artifacts in secondary refuse deposits from architectural construction fills under plastered floors at ancient Maya dwellings demonstrates one end point during an object's use-life trajectory. Because of its color and texture, it may likely be geochemically sourced to highland Guatemala. Analysis of a few of these blades may show lateral use-related edge damage, but attributes on their distal ends show small pressure flaking extending over previous lateral use. Through observing these different use related surfaces an apparent change in use-life is identified. Tools can be discarded and then reused, recycled, or experience a reincarnation as something else. These use-related attributes may also highlight behaviors by household inhabitants to work particular materials as part of quotidian or daily life.

Another excavated space within this same structure above and in association with what appears to be a line of stone, perhaps capping a human burial, exposed a crushed or smashed ceramic urn. It seems crushed with the weight of soil, roots, and time. Emerging out from the sherds of the crushed vessel are black shiny stones. After brushing these stones free of matrix, it is apparent some are notched exhausted polyhedral-blade cores. Other exhausted blade-cores from the cache are mere fragments. After further brushing and trimming roots, more obsidian objects emerge. Later lab analysis shows these to be debitage or waste flakes from rejuvenating blade-cores and initial efforts to shape macrocores – an early stage in core preparation. These objects, commonly called "eccentrics", do not appear to have use-related damage on them. Even closer examination of the cache obsidian assemblage reveals two of exhausted blades-cores fragments from the cache once thought to be two items, actually refit. It is immediately apparent that these two pieces form the medial and near complete distal portion of the blade-core; however, the proximal pressure platform is missing and lateral percussion scars on the medial segment indicates it was intentionally removed. This third core fragment is not among the other pieces recovered as part of the cache deposits. Attributes on the medial and distal core segments shows they were separated from each other through direct percussion as the core sat on an anvil. These acts of sectioning the core essentially destroyed the already exhausted core.

The above vignette illustrates one type of archaeological encounter, which at first glance appears to be two assemblages with different types of obsidian artifacts – extensively *utilized blades* from refuse/fill and *non-blade items* from the cache. Both life-history and object biography approaches may trace each within its own linear trajectory, there is the life (and after-life) of blades and there is the life (and after-life) of non-blades. Situated within Maya obsidian studies, however, it is clear that each artifact is a component part of the same “operational chain” in the technological reduction of knappable stone (cf. Hruby 2007). The chaîne opératoire analytical method ensures we keep track of these different yet technologically interconnected pieces. Each was removed during a different stage of core preparation, reduction, and rejuvenation in the process of blade tool production. Some of these artifacts show macroscopic evidence of quotidian use-wear, while others, potentially retouched to form other shapes, were ritualized during their inclusion in a lidded cache vessel that was placed to potentially mark a burial feature. Ritualized actions do not necessarily relate to religious or symbolic action, but rather refer to repeated practices, using like kinds of objects, that are embedded in historical processes.

Faced with these artifacts and contexts, how can we make sense of them to discover something new or to test previous interpretations about similar contexts excavated elsewhere? Certainly contextual and artifact attribute analysis is a necessary starting point. Is our goal to reconstruct an artifact’s use-life post production which can help to inform past human tool use behaviors? Or do we begin earlier to determine tool production practices or the transformation of materials through employing an operational chaîne technique (Edmonds 1990; Hirth and Andrews 2002; Sellet 1993)? Or is it to study the pathways, routes, or itineraries that moved and transformed (i.e., shaped) these objects to the point of archaeological discovery? Archaeologists can contribute to any of these research objectives. I advocate that we seek to understand the routes or itineraries by which materials moved and were transformed to better inform how and why people, places, and things are linked in complex networks. Objects of course cannot necessarily move by themselves and therefore understanding people still remains an ever-present goal.

Regional research using geochemical obsidian signatures enables us to encounter obsidian after it has been formed through geological processes. (Although we could go back further with the geological circumstances that led to the formation of obsidian deposits. We could also begin by understanding that some obsidian sources were exploited for millennia before even more rock was quarried during the Maya Classic period). While traveling away from quarries, an obsidian block or nodule may be transformed at other sites into smaller sizes efficient for travel via a land and/or water route. Sometime later, obsidian arrived at yet another site (i.e., consumer sites) and perhaps directly to those skilled craftspeople that transformed it from reduced nodule or macrocore into tools. Those bringing obsidian to consumer sites would have possessed the knowledge of what the intended crafters and consumers had planned. Potential merchants operating between quarries and consumer sites also had to be knowledgeable operators (and prospective itinerate crafters [Hirth 2013]) accountable to both regional producers, local consumers, and potentially those elites sponsoring places of exchange (Tokovinine and Beliaev 2013). Simply put, those traveling between quarries and sites would ensure obsidian macrocores were large enough to be of value to crafters so that local crafters could meet the demands of their local markets to provision households.

Workshops are yet another place where we can encounter obsidian. Workshops are transformative loci where significant reduction and material fragmentation occurred.

Each step in the reduction process can be imagined as another place along a route. Each step representing the actions of skilled labor to shape cores, rejuvenate errors, and produce blade tools. The now fragmented or fractal core is visible by viewing its now exhausted state and through the accumulation of waste debitage and blades. Each of the pieces may now move independently, yet each is ‘enchained’ forever in the process of blade-tool production.

Tools and potentially other obsidian objects then circulated through an exchange place (e.g., market), where even more material and people interact. Household consumers interacting at markets or other locations could ‘purchase’ goods, some of which are obsidian, by exchanging other wares for items they wish to possess but do not directly produce. At these confluent places of exchange, different routes cross and are therefore linked, setting in motion (or maintaining) relationships between producer and consumer and exchange of this/these object(s) for that/these object(s).

Consumers after returning home make use of their ‘items of purchase’ in daily or eventful acts. They can be used right away, curated for later, or further exchanged with others not present at the market that particular day. After use, these objects are discarded or intentionally deposited by their users. Archaeologists can term these seeming ‘end’ places as yet another provenience or stage along an object’s itinerary.

The situations described above do not encompass all the points at which objects pass through and although this route may be filled with gaps (Joyce and Gillespie 2015:3), Joyce (2015:29) reminds us that,

> Even when we cannot be sure of the entire route, seeking to trace a thing’s itineraries forces us to ask where it came from and where it might be going and stops us from ignoring the current segment of its itinerary or from treating that segment as discontinuous from its past.

Life-History, Object Biography, and Itinerary: A Short Review of Theory and Method

Analyses of flaked stone artifacts commonly employs linear and semi-cyclical schematics that show stages at which materials go through physically (and culturally) transformative steps. These schematics illustrate a reductive sequence or operational chain of events. Frédéric Sellet (1993) positions the reduction sequence of stone – the actual steps preformed to manufacture a tool – within the broader chaîne opératoire approach. For Sellet (1993) and others (see Bleed 2001; Chazan 2009; Mauss 1973; Leroi-Gourhan 1964; Tostevin 2011) the chaîne opératoire method is just as social as it is technological. Sellet (1993:106) states,

> the *chaîne opératoire* aims to describe and understand all cultural transformations that a specific raw material had to go through. It is a chronological segmentation of the actions and mental processes required in the manufacture of an artifact [an object] and in its maintenance into the technological system of a prehistoric group. The initial chain is the raw materials procurement, and the final stage is the discard of the artifact.

Right away with this definition, lithic analysists in particular are granted a at least of four scalar analytical levels: (1) raw material sourcing; (2) post-procurement reduction practices; (3) tool use (and reuse); and (4) tool discard/depositional behavior. This approach, although often implicit, concerns itself with the use-life or life-history of a singular object. Therefore, reduction sequences, use-related attributes, and tool discard studies follow one item during its use-life (Gosden and Marshall 1999:169; LaMotta and Schiffer 2001:21; Tringham 1994:175) even though each followed item is part of a larger process. The use-life approach foreshadowed the positioning of artifacts along linear trajectories not unlike those of humans. An object has a birth place and a death place – a nodule was birthed from a quarry, a core from a nodule, a blade from a core, a tool from a blade, another tool from a recycled blade.

These artifact life-histories were fundamental to behavior chains (La Motta and Schiffer 2001:21). Because the archaeological record is always incomplete, it is seldom possible to reconstruct an entire life-history, so in this regard LaMotta and Schiffer (2001:21-24) explain behavioral chain “segments” are useful units of analyses and that “behavioral chain segments allow the researcher to infer the types of activities that might have been responsible for the formation of a specific archaeological deposit…” One of these segments is tool manufacture, another is use, and still another is tool deposition. Behavioral chains, as a broader theoretical approach, still center on following singular objects, yet consider them within larger social and physical fields of research.

Within each behavioral chain segment (defined by the analyst), an object can have multiple lives and multiple deaths as there was an effort to emphasize that an item may be discarded, abandoned, or lost, but that later it may be encountered and reclaimed, recycled, or reused (see LaMotta and Schiffer 2001:21 Figure 2.2; Schiffer 1976:46). In this regard some objects are reincarnations (Joy 2009:541).

The behavioral model also allowed for the analysis of intentional “fragmentation”. During the biography of an object it may have been deliberately broken or fragmented. A fragment of a whole object may be deposited during an event while the other piece(s) circulated among those living individuals, forever “enchaining” the participants to the whole object as well as to the act and place of its fragmentation (see Chapman and Gaydarska 2007). Through the consideration of these fractal object biographies the metaphor of birth-life-death-afterlife was continually likened and linked to human lives.

Objects were assumed to live out the lives of their makers and *index* – or stand in for – human activities, local histories, and specific places (Joyce 2007; Preucel and Bauer 2001:89) and in so doing provide greater historical depth to an object's inalienable properties.

"Object biographies" and "the social lives of things" as proposed by Kopytoff (1986) and Appaduri (1986) respectfully infused archaeology with a critical theoretical and methodological framework as well. Specifically, this framework helped to chart the changing meaning or *value* of particular objects during its respective biography. Appaduri (1986:3, 13) asserted "commodities, like persons, have social lives" and during an object's "*total* [emphasis in original] trajectory from production, through exchange/distribution, to consumption" value can change. It must be remembered that he was discussing singular objects and how they move in and out of fields of commoditization (Fontijn 2013:187).

Kopytoff (1986:66-67), while proposing we follow objects in motion, equated the biographies of things to those of people. Clark (2007:31) likewise *re-thought* aspects of craft specialization and the economic/non-economic value of crafted objects calls for analyses of "artifact genealogies" (see also Clark 2004). Clark (2007:31) states, "Patching together genealogies will require fine-grained analyses of attributes of many different *kinds of objects* [emphasis mine], with particular attention to techniques of manufacture, evidence of use and abuse, and social contexts." In this statement by Clark there is continued emphasis on how object biographies, yet varied, are equated to human biographies; the lives of objects inform us about the lives of their makers.

Some "biographical objects" are uniquely inalienable and are bathed with personhood of their makers, givers, and receivers (Hoskins 1998; Joyce 2015:11; Mauss 1954; Weiner 1992) and are therefore active in the lives of humans. Joyce (2015) and others (Hans and Weiss 2013; Joyce and Gillespie 2015) argue that, although the object biography and life-history metaphor has contributed to archaeological studies of artifacts and whole classes of materials generally, the metaphor by default is prefigured to treat objects like people. A major shortcoming of object biography, as Hahn and Weiss (2013:7) point out is that,

> moments like *birth* are difficult to pinpoint, and similar problems emerge with respect to the object's *death*…New objects emerge through remodeling of other objects, and objects that have been buried receive much more attention upon rediscovery.

The object biography approach prefigures when analysts' start the use-life of an object as it was finished or nearly finished (Joyce 2015:27). More generally, however, a life-history approach could describe the life of quarried nodules to their initial stages of reduction into macrocores. Now a macrocore, the nodule is no longer in existence. The macrocore then takes on a life of its own, only living until it is even further reduced to create an even more refined shape. The debitage produced from this process may take on a life of its own as well. Other products produced during core reduction (e.g., blades) can have their own lives within the hands of tool users. This process continues until cores are exhausted. As studies have shown, these exhausted cores are then destroyed, terminated, or "killed" and may then go on to lead after-lives as "eccentrics" (Hirth 2006:78). Each item involved in the process of tool production can have a life of their own and some may even have an after-life or be reincarnated as something else. It is up to the analyst to relate these seemingly separate analytical artifacts – each with their own lives – to a broader industry of blade making. In other words, and in terms of obsidian objects do not necessarily lead lives like those of humans.

An itinerary approach does not assume to know or determine a beginning nor an end, but rather sees objects as mobile, passing between multiple places and handled by many individuals (Joyce 2015:29) as part of a network or meshwork of relations in the flow of matter (Ingold 2012). Therefore, each object produced as part of blade-tool manufacture is never disparate – it is forever enchained or linked to the prior places and transformations, each with their potential future.

For example, Haskell (2015) analyzes the itinerary of a chunk of obsidian in terms of an "object-subject", as both a physical object and an active subject. According to Tarascan ontology, the chunk of obsidian embodied the guardian deity Curucaueri – a central Mexican deity. In discussing the *fractal itinerary of obsidian*, Haskell (2015) explains that the deity – the single obsidian chuck or core – was, according to historical narratives, present within each obsidian blade removed from the core. These blades – now separate idols – would circulate and come to rest at sites, thus creating connections with inhabitants at those "consumer" sites within a larger political and ideological network. Haskell (2015:77) explains however, that treating each as a separate idol or object, after being split off of a core, would neglect their boarder historicity and connectivity. He goes on,

> The multiple idols were not merely objects unconnected to anything else; they were and had been constructed to be, the same thing. The idols in their collectivity were all one single thing because at one point in their itineraries, that had been one single thing" (Heskell 2015:77).

Similarly, flint can be a reliquary or receptacle for scared subjects in much the same ways objects can *index* other relations, other objects, deities, or people (Joyce

2012). Pohl (1998:188) notes:

> an object dedicated to the goddess *Citlalicue-Cihuacoatl* … a personification of the Milky Way who guarded the first level of heaven. As an avatar for *Cihuacoatl*, she was also invoked by midwives and curers together with *Chalchiuhtlicue*, the water goddess. *Citlalicue-Cihuacoatl* once gave birth to a knife blade that she treated as her child by keeping it in a cradle. When her sons [including Quetzalcoatl, and Tezcatlipoca] learned of the object, they were enraged and hurled it to earth. The flint struck at *Chicomoztoc*, the seven caves of creation, and 1,600 gods burst forth from its body.

Here another central Mexican historical narrative of creation is embodied in flake stone. The myth references a female, a birth/death, and a curation, while keeping the knife in a bundle or a cradle. Furthermore, the account involves jealous siblings or other figures with an aim to destroy another, and once the act of destruction occurs (flaking stone), the knife gives *birth* to other deities or causes the creation of gods. Each god then goes on to live their unique existence, yet being forever linked to the original object and act. The itinerary approach allows for seeming singular objects to stay connected to temporally and spatially distant, sometime mythical, places.

Just as illustrative in the above accounts is the relationship of the materiality to flaked stone. Conchoidal fracture and the physical act of the shattering of stone is central to the construction of the myths, the act of creation, and the associated gods and events. The materiality or physical properties of these objects are what allow for the intersection and relationships with other culturally constructed gods and other humans, or as Jones (2004:330) states,

> It [Materiality] promotes the view that the material qualities of the environment actively affect how they are perceived, used and symbolized, and – importantly – it emphasizes how those material properties are enrolled in the life projects of humans. Furthermore, it promotes a historical perspective to the processes of interaction between person and environment.

Conchoidal fracture is a fundamental material property that affords obsidian and flint (or chert) a place within historical and mythological narratives. Other properties may include a general shape, a fine cutting edge, a color, or some other physical attribute that indexes the object's unique "biography" within a larger itinerary. Some of these attributes take center-stage or affect change depending on unique circumstance or field of action, but all the properties still remain "bundled" (Keane 2005). As an object moves and is transformed it may retain all that happened before and all that may happen in the future. In objects exist their materials properties as well as their accumulated and potential histories (i.e., individual life-history or biography, as well as their broader relational itinerary). For Keane (2005:188), "there is no way entirely to eliminate the factor of [this] copresence, or what we might call *bundling*" (emphasis in original). Keane (2005:188) went on to claim that "qualities bundled together in any object will shift their relative salience, value, utility, and relevance across contexts."

Bundling in this regard may help to explain in part why certain objects can become ritualized or be subject to ritualization because of their recognized social and historical depth and importance. Here ritual is treated as eventful, as a practice set apart from the nominal ebb and flow of daily life (Connolly 2013). According to Bradley (2003:12), "ritualization is both a way of acting which reveals some of the dominate concerns of society, and a process by which certain parts of life are provided with an added emphasis." Therefore, rituals provide loci where humans can acknowledge a shared local history with one another and potentially recognize that they too are enchained in the itineraries of non-human objects.

I have tried to emphasize the depth and complexities of seeing non-human objects as active players in human lives. An itinerary approach helps to better articulate theses complexities without having to know a single object's birth or death place. We do not have to know these two points to discuss how an object – as part of a network – operated with other objects, materials, places, and people to transform and/or maintain human social life. And like DeLanda (1997) purports with his non-linear history, Joyce (2015:37) asserts, "Object itineraries open the way to understanding how things work both on the intimate scale of the human life span and on the vast scales of geology, cosmology, and social history." Although beyond the scope of this review, the itinerate perspective is an outgrowth of recent material culture studies, a reaction against archaeology's anthropocentrism in favor of a post-humanist analysis of objects (i.e., to de-center humans in the analysis of artifacts and curated museum collections), a "new materialism", and that ultimately there exists a material world independent from human perception and our existence (Bennett 2010, Dolphijn and van der Tuin 2012:39; Knappet and Malafouris 2008; Olsen 2010; see also Joyce and Gillespie 2015:5-9).

Toward an Itinerary of Obsidian: Reconstructing Its Movements, Routes, and Transformations

At a multiscalar level, regional obsidian trade, local use/depositional patterns, and artifacts in the hands of an analysts represents stages along an itinerary. However, while discussing these as well as other selected points in between, the movement of obsidian can be seen as fractal and not exclusively linear as some biographical or life-history approaches trace. It is in this fractal, non-linearity that a biographical approach to the study of obsidian movement is insufficiently comprehensive. Like the properties of flaked stone, the study of the reduction and movement of obsidian is full of pieces that get spread out over an area through various intentional and unintentional (human) activities. The study of this fragmentation and movement will help to show how obsidian was integral for both quotidian and ritual life at an ancient Maya city. As obsidian moved and was transformed, it increased in socioeconomic importance and connected various disparate populations, forming a wider cultural identity. While I present a number of scenarios involving people's relationships with obsidian, I do not claim to trace each one, but rather aim to develop the complexities of obsidian movements and how it was entangled with the lives of humans.

Assessing Regional Exchange through an Itinerary Approach

This research encounters obsidian as it had already entered Caracol's borders, yet, it traveled significant distances prior this arrival. Using HHpXRF and technological analysis some obsidian arrived as macrocores – those objects that were initially shaped by those working at a quarry or those somehow associated with early stages of reduction in preparation for transport – while others were imported as finished objects. As others have shown, macrocores from the Guatemalan highlands were normally transported into the southern lowlands (Braswell 2010; Braswell and Glascock 2007; Moholy-Nagy et al. 2013). The safety of obsidian's transport was contingent on the overall size and weight of macrocores and the knowledge and skill of transporters. Multiple scholars have speculated on these possible routes (Demarest et al. 2014). These routes likely included crossing land as well as water (i.e. both river and sea) and would have passed by or through potential competing polities.

Obsidian could have been a common denominator. However, it may have been a material that structured alliances rather than competitions. Braswell (2010) cites at least one case where this may not be true, but it appears from the Caracol data and sites northward, that obsidian was fairly ubiquitous (e.g., Trachman 2002; Meierhoff et al. 2012). It was not significantly transformed until it arrived at consumer sites, although the amount moving northward was likely contingent on those receiving it first (Braswell 2010).

Because of the network of people working (and learning) together to ensure obsidian's safe arrival at consumer sites, I argue that a larger community is understood. Roddick (2015) explains that he understands a "community of practice" (Lave and Wenger 1991) to emerge as he assesses the movement of geological resources within an Andean context. In regional exchange from geological sources to consumer sites, communities of practice help to model human cooperation, learning, and sharing of particular practices that everyone may use and benefit from. This concept also helps to link the identity of those seeming disparate regional merchants to those anticipating the arrival of more obsidian.

In terms of a macrocore's itinerary up to the point where it enters a site's local exchange relations potentially at workshops, it traveled extensively, being cared for along its journey with those looking to provision others and extend their regional reach. If it broke along the way, particular relations could be at risk. It may have been exchanged multiple times, all the while building socioeconomic value. Its color, texture, and other surface features may have provided selling points as it was transported and exchanged: thus, its materiality could have structured social relations far beyond its quarry location. This macrocore, as well as those transporting it, carried a significant social as well as economic and physical burden.

Obsidian Itineraries at Workshops

As we encounter obsidian at workshops, we assume it was still in the same form as it traveled. If so, crafters would have to start their reductive practices by first continuing to shape the core into a pressure blade-core by trimming various margins. If recently imported materials were broken, crafters may have had to troubleshoot the now broken core to regain some predictability in removing blades. Regardless of the form of the core, crafting activities or reductive techniques were contingent on those others that brought obsidian into the local area (see Hirth 2006). Crafters may have had to communicate directly with regional merchants or direct their attention to other intermediaries who accepted regionally exchanged goods.

After this process of exchange, initial stages of core reduction, and further shaping, waste material was produced and had to be managed. Other waste was also managed as cores were rejuvenated due to production errors or when cores were initially exhausted. These materials too had to be managed to prevent local residences from accidentally stepping on sharp waste. Aggregate analyses of all obsidian artifacts can show that these various stages of lithic reduction occurred locally at Caracol, while analysis of obsidian's contextual associations from Caracol's non-obsidian crafting households lends evidence to support the idea that reduction waste was extensively managed and appropriated for various uses far beyond obsidian workshops.

Artifact analyses may also demonstrate that the techniques used to reduce cores and produce blades is similar or near identical to other blade-making techniques employed at other sites, even those outside the Maya area. If this is the case, it would again signal that obsidian crafters at Caracol, at some point during their training, learned established techniques, thus enabling them to reproduce a multi-generational tradition.

Embedded Itineraries during Exchange Negotiating Social Relationships

Once we follow obsidian in and out of the workshop, a number of other dimensions also emerge. The training and duties of crafters may have also included social engagements with regional traders and/or local intermediaries at local points-of-contact (e.g., markets) necessary to obtain obsidian. Likewise, those crafters could communicate with other market attendees. Crafters would have to be knowledgeable about local demand for both ritual as well as quotidian provisioning. Likewise, non-obsidian producing households were depended on obsidian workers a great deal to reproduce daily and ritual life. Here again, crafters and obsidian have a significant social, economic, and ritual burden.

Markets, as historically situated within a landscape, create a space were people and materials assemble. This “assemblage” (see DeLanda 2006) or market – contingent on many actors, their wares, and their unique station in life – is a point of communication, negotiation, and potential integration. Through person-to-person dialogue obsidian is transformed, not in form per se, but in socioeconomic meaning. Similarly, during regional exchange, its “value” may be contested. Some objects may be alienable products, while others may retain some connection to their makers. But although competition during exchange may occur, it also established a point where those living far apart can establish, maintain, or alter their social relations. In this regard markets are not apathetic places of purely economic interaction full of rational human automatons, but rather are places where social relations can be fostered through negotiations of materials. In this regard, markets and transactions are likely *embedded* in older established traditions of negotiating complex social relationships (Garraty 2010:15). These older traditions likely did not include humans gathering at marketplaces, but rather occurred through person-to-person engagements.

Quotidian Use and the Ritualization of Obsidian at Caracol, Belize

Residential use of obsidian can be discussed in two broad ways. First, the quotidian – ordinary every day – use of obsidian can been seen in the analysis of domestic trash or refuse deposits. Because these deposits represent daily and repeated activities, they should include the same kinds of artifacts and be mixed with other domestic refuse items, such as ceramic sherds. Second, ritualized obsidian should be evident in the inventories of residential burials and caches.

In term of obsidian's itinerary, much obsidian circulated to domestic space albeit in many different forms. Residences would have obtained blades for daily tasks. They may have obtained ritualized obsidian (usually not blades), often termed eccentrics, for intentional deposition within eventful space. As we will see, eccentrics – ritualized obsidian – can be formed from just about any stage of obsidian reduction. Hruby (2007) explains that because religion structured production, these can be ritualistically produced as crafters' retouched blade-cores during rejuvenation. They are often described in terms of their symbolism. Despite cognitive references, it must be remembered that eccentrics, as *only* symbolic or representational objects, have been de-assembled from their history. They have been objectified and cut off from their history and context (Gillespie 2015:61). Their history includes the stages up to the point at which we encounter it as an eccentric; it is what remains after all the travels and transformations. Households may have selected these non-blade objects specifically because of their unique itinerary in their movement through both regional and local social field of action. These ritualized obsidians can be thought of as an object with multiple “bundled” attributes (see above).

Household inhabitants could have obtained obsidian for each of these uses through engaging in local markets. Ultimately, however, provisioning both quotidian and ritual objects was contingent on the work and organization (and social relationships) of obsidian crafters. Likewise, households needing these objects would have had to prepare for their exchange by either producing crafts of their own or gathering potential food stuffs and timing exchanges to when markets operated. The pace and rhythm of market cycles is not known, but probably depended on availability of local resources both perishable and nonperishable. Here the itinerary of obsidian begins to bleed into a vast network of social relations that have come to define an urban or political entity.

Obsidian ‘Artifacts’ as Obsidian ‘Objects’ and a Summary

Thus far I have repeatedly termed the material of this research as ‘objects’ rather than describing them consistently as ‘artifacts’. They are most certainly archaeological artifacts – “something created by humans usually for a practical purpose; or an object remaining from a particular period” (*Merriam-Webster* 2002:80), whereas ‘objects’ can arrest our attention (Brown 2001:3). Brown (2001:4) asserts that, “We look through objects because there are codes by which our interpretative attention makes them meaningful, because there is a discourse of objectivity that allows us to use them as facts.” While Brown (2001) is contrasting ‘objects’ with ‘things’ (see also Ingold 2012), his statement about objects helps to position them as “objects of knowledge” (Joyce and

Gillespie 2015:4).

It is within this framework that archaeological analyses of artifacts purports material remains from the past to be something created by humans for tasks, but also aims to discuss them as ‘objects’ that not only arrest our attention today (i.e., as something ancient, pretty, sharp, or something that will help advance our career), but that these same items may have also arrested the attention of those in the past during their daily lives. In this regard, each (nonhuman) object, depending on where we encounter it along its unique itinerary, has the potential to affect change as an agent or actant alongside their human counter parts (Braswell 2011:1; Callon and Latour 1981; Gosden 2005; Gosden and Marshall 1999; Latour 2005).

In summary, irrespective of the theoretical orientation that inspires this research program to move forward and be organized in a particular way, each topic addressed in the subsequent chapters may exist as separate case-studies depending on the topic of interest to other researchers. The obsidian sourcing data link Caracol to regional exchange. The technological chapter, Chapter 5, describes the local production of blades and related obsidian objects. Chapter 6 on exchange demonstrates and reaffirms the importance of market places in provisioning households with commodities (e.g., blades) and potentially ritualized obsidian objects. Distributional data further emphasize a well-integrated economic and ritual landscape. Analysis of recovery contexts by artifact type further refines how obsidian was used at residences. During analysis it became predicable where certain forms of obsidian would occur (e.g., notched blade-cores, aka eccentrics, in caches). These and other data then create the opportunity to describe and understand regularized practices and potentially inferred power of obsidian crafters in ancient life.

It is expected however, that through the use of the itinerary approach, which incorporates object biographies and life-histories, we will gain a deeper understanding of what obsidian material and its uses may have meant to local Caracol inhabitants during the Classic period. Through reconstructing the places obsidian was involved in with human lives and the movements through these same places, we study an itinerary, as well as people, with their objects. In this case, obsidian is the material that helps reveal an itinerary that structured and was structured by human lives. The itinerary of obsidian included and includes places that are spatially and temporally distant. Their itinerary extends further even now as objects in multiple boxes just beside my desk. They represent the weight, burden, and angst of trying to finish this project and share the results. They are still traveling and influencing life. It is only through their itinerary as excavated artifacts and (re)assembling it in one place that this research can occur. We can say something about these objects (i.e., produce knowledge about the past) because of their durability and their route as objects in the present.

CHAPTER 3
A REVIEW OF CARACOL, BELIZE AND RESEARCH QUESTIONS

This review of Caracol outlines many important contributions to Maya archaeology and also demonstrates the major topics that relate to a study of obsidian at the site. First, Caracol's settlement pattern is described to demonstrate the breadth and depth of Caracol's population during the Classic period. Regional economic issues are then outlined to show how Caracol interacted outside its known boarders to obtain a diversity of materials through and up to its eventual abandonment after A.D. 900. In this section, the obsidian sourcing study that considers both spatial and temporal distributions is positioned to further emphasize Caracol's regional gravity and potential exchange relations with their nearby and more distant political neighbors.

Next, Caracol's local economy is presented in terms of integration and the importance of marketplace exchange (A. Chase and D. Chase 2009; A. Chase et al. 2015; D. Chase and A. Chase 2014). Both the regional and local economy are provided greater emphasis through understanding the personal and inter-personal relations involved in the mechanisms for provisioning households and the organization of the local crafting of both local and extra-local raw materials. Obsidian research in this regard focuses on the technical practice by local lithic crafters and then a discussion of how crafts were distributed to consumers. Broadly, how did local obsidian crafters produce blades? This is fundamental to understanding how local crafting practice was similar or dissimilar to other Mesoamerican sites. In terms of exchange, were obsidian blades and other non-blade objects exchanged through marketplaces or some more intra-personal, restricted mode? If obsidian access was widespread, thus reinforcing an already supported marketplace model, were there potential differences in overall consumption amounts with regard to household size or wealth?

After presenting regional, crafting, and macro-economic exchange topics, research questions are presented that pertain to how obsidian was used as quotidian domestic tools and also ritualized during human burial and caching events. In terms of domestic tool use, obsidian macroscopic analysis will help to emphasize the regularity in how flaked stone was employed in daily life. Existing knowledge produced from Caracol's domestic chert industry is also better understood through an analysis of obsidian because nearly all investigated households exhibit both lithic materials and materials crafted to produce blades. Chert and obsidian were fundamental to how the ancient Maya changed their landscape, provided for families, and expressed their identity. Likewise, the ritual nature of obsidian in the Maya area is undeniable. One case-study from Caracol is presented to demonstrate the importance of the ritualization of obsidian and shows that an analysis of ritual obsidian research can add greater depth to our current understanding of the materiality of Maya rituals.

Finally, as part of the overall site review and the presentation of research questions, a brief description of what was formerly known about the local obsidian industry prior to the current study is provide followed by any limitations of the data.

Settlement Background

During the Classic period (AD 250–900), Caracol was an urban area supporting approximately 100,000 people of varying of social status, including a large 'middle-status' (A. Chase and D. Chase 1996; A. Chase et al. 2001) population residing in more than 4,732 elevated households situated among some 200sqkm terraced agricultural land, as seen from a recent LiDAR aerial survey (A. Chase and D. Chase 2010; A.

Chase et al. 2013). This kind of tropical settlement is characteristic of an agrarian low-density urban landscape in that the settlement at Caracol is widely dispersed across a vast area in the form of clustered house groups interspersed among open terraced land (Fletcher 2009; Isendahl and Smith 2013). This type of household proximity is hypothesized to most aptly have represented social neighborhood units (A. Chase et al. 2013; A. Chase and D. Chase 2012a). A prominent feature of Caracol is its roads or *sacbes* that connected distant termini to the city center (A. Chase and D. Chase 2001). The dispersed population situated in neighborhood units and intensively terraced agricultural landscape occupied nearly every square meter in between these *sacbes* (A. Chase et al. 2011:394, Figure 8). Figure 3-1 shows the area surveyed by both terrestrial mapping and areal LiDAR (light detection and ranging in 2009), as well as the distribution of archaeological investigations dealt with in this work.

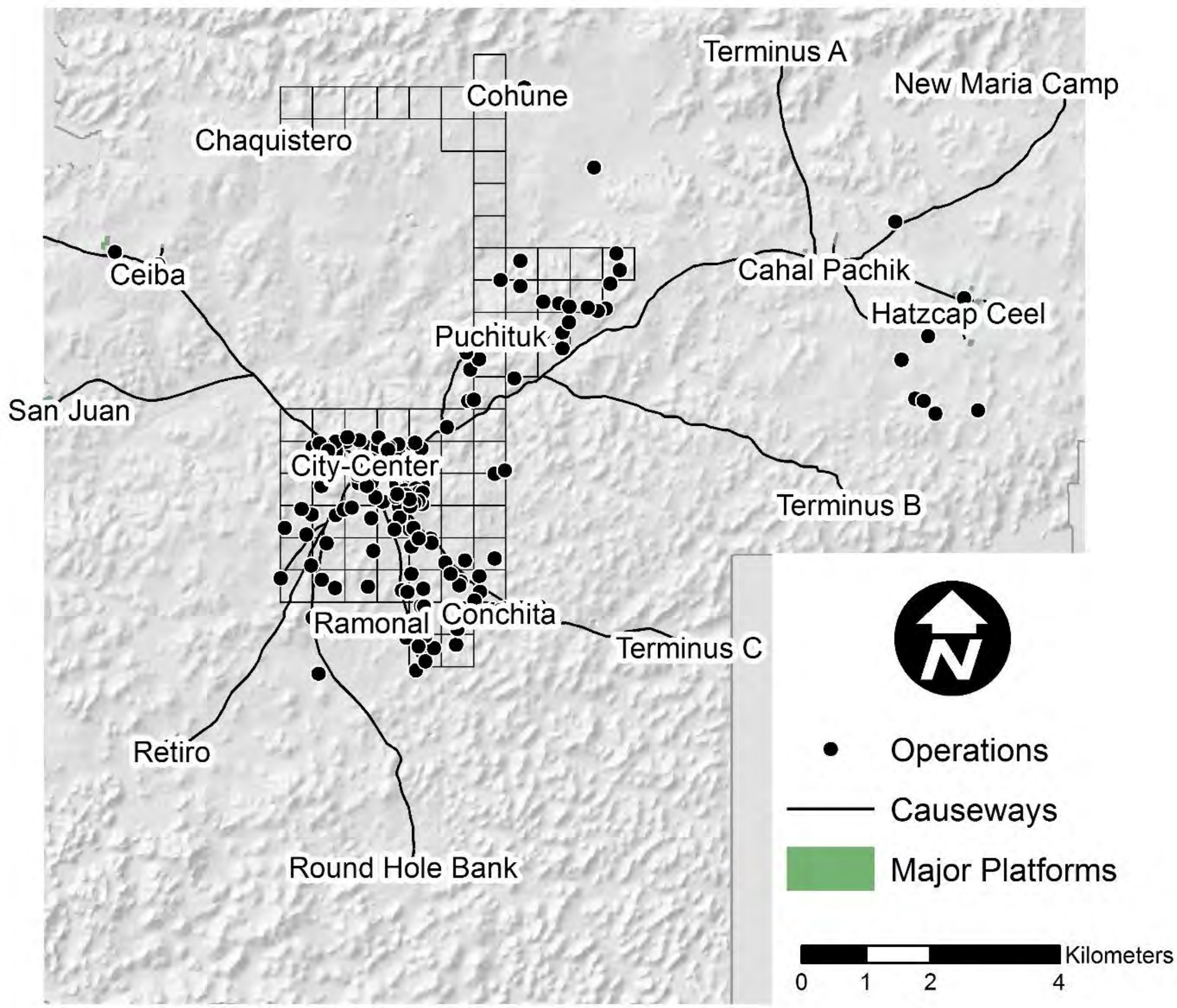


Figure 3-1. Site overview map with terrestrial survey grid, roads or *sacbes*, and a 15 meter hillshade layer created from the LiDAR aerial survey digital elevation model (DEM). Points show the distribution of Caracol's archaeological investigations mentioned in this dissertation.

Regional Relationships and Research Objectives

Caracol's regional economic breadth can be seen in an archaeological inventory of household and epicentral excavations. Here the regional economy is discussed briefly using a wide range of materials to demonstrate Caracol's regional influence, control, and access. Next, data and perspectives on the Classic period local economy is presented to further demonstrate how materials were used and that their distributions are highly suggestive of a well-integrated economy due to the presence and influence of markets (D. Chase and A. Chase 2004, 2014a).

Much of Caracol's regional economic influence and access to resources is dependent upon its unique location on a karstic plateau in the Maya Mountains. At first glance being situated on this karstic landscape seems to provide little in the way of access to good local resources like quality flaked and/or ground stone or more importantly water. However, a vast anthropogenic landscape emerged during the Classic period to provide agricultural resources for more than 100,000 people (A. Chase and D. Chase 1998, 2016; D. Chase and A. Chase 2014b). And a quick study of a Belize geological map shows how lithic resources (slates shale, granite, and perhaps some basalts) were available to the north, west, and south (Cornec 2003). These materials were crafted to create personal adornments, manos and metates, and were probably used as polishing stones for working jadeite and obsidian. Caracol seems to be at the confluence of many regional trade routes like other sites in the Petén area (A. Chase and D. Chase 2012b). Although Caracol's regional influences can be sketched through a review of the epigraphic record (Grube 1994; Martin and Grube 2000), a review of key raw materials also demonstrates Caracol's reach. Unlike written texts and a regional political history, by studying the wide range of materials available to the site's ancient inhabitants we also begin to examine local supply/demand economics and how those materials were distributed or provisioned to the local population.

Marine resources from the Belizean sea coast, off the coast of the Yucatan Peninsula, as well as the Pacific Ocean have been recovered from a variety of archaeological investigations and are typically associated with burials, and caches, and shell workshops (Cobos 1994:143-144, Table11.1). Cobos (1994) reported that of the 3,650 shell artifacts he sorted 1,101 (30.1%) were formed objects (e.g., pendants, beads, disks, rings, earflares). He also reports that many of these objects were locally crafted, thus indicating the importation of whole shells from varied and distant coastal regions (Cobos 1994; Pope 1994).

More recent investigations also confirm the presence of worked shell artifacts and deposits of whole shells and fragments of coral in cache contexts (A. Chase and D. Chase 2014:165, Figure 114d, Figure 129, 2015a:59, Figure 26a). Other marine resources were also imported into Caracol. Cunningham-Smith (2011; Cunningham-Smith et al. 2014), from her analysis of fish remains from a ritual cache (A. Chase and D. Chase 2008) convincingly showed that an efficient route from the Caribbean Sea to Caracol was in place where knowledgeable navigators could transport live stingrays for ritual offerings. Deposits such as this one also show that other resources were available and likely traveled the same route. In particular, the cache (S.D.C179-1) containing the live stingray, chert eccentrics from northern Belize as well as jadeite, *spondylus*, obsidian, metamorphic rock, and locally available chert were all present. This single deposits represents the confluence of both local and extra-local materials and demonstrates the breadth of Caracol's involvement in regional trade during the Early Classic. A. Chase and D. Chase (2008) also describe this Early Classic cache as being embedded in "cache dirt" and state:

> this cache dirt was full of small chips of valuable materials. In the case of S.D. C179D-1, the cache dirt consisted of 747 jadeite chips and 4751 spondylus chips. Also recovered within the cache dirt were 23 chert chips, 32 quartz chunks, 4 obsidian blade fragments, 2 unworked shells, and 138 slate mirror pieces; the scattered distribution of the slate mirror pieces suggests that they did not constitute a single artifact.

The cache dirt is intriguing on a number of levels, but an interesting topic should be noted regarding this "dirt" (A. Chase and D. Chase 2015b). All the little chips of stone and bits of shell and other materials had to be obtained from some local crafting workshop or workshops. No crafting evidence from this house group was recovered during the 2008 investigations. The presence of these materials indicates that those residing at this residence during the Early Classic had a connection with said workshop crafters. Again, this single deposit and others like it help to show that households had access to a breath of materials, they participated in local exchange mechanisms, and potentially crafters themselves, to provision household rituals.

Ceramic data from Caracol also demonstrate the breath of regional interaction. A salient case to briefly describe is the Belize Red pottery assemblage. A. Chase and D. Chase (2012b) state that,

> These redware ash-tempered ceramics are widely distributed, being recovered along a corridor that extends from a northern boundary with the Yalbac Plateau in central Belize possibly all the way to the Naco Valley in Honduras. Their area of distribution extends westward into the Sibun River Valley and throughout southern Belize. They are reported in archaeological contexts from Lubaanatun, Nimli Punit, and Pusilha – and at least two burials at Pusilha contain a Belize Red vessel.

These standardized ceramics (A. S. Chase and A. M. Chase 2015) are commonly recovered from Caracol's Late to Terminal Classic burials and are evidence for both widespread regional exchange and local market exchange (A. Chase and D. Chase 2012b:3-4). A. Chase and D. Chase (2012b:11) conclude that Belize Red trade routes may have existed even further back in time during the Late Preclassic (based on E-Group prevalence in the SE Petén) and was certainly thriving into the Terminal Classic. This trade route was therefore likely influencing the import and export of all sorts of materials between sites near the Belizean coast and those more inland as far as the Petén area and points in between. Caracol was centrally located within this route (A. Chase and D. Chase 2012b).

These brief introductions into the breath of materials available and used by Caracol over some 500 years shows that Caracol was a center of gravity for regional exchange. Also important is that these materials were widely available to many if not all local households. With this background perspective, obsidian research can help to add additional depth with regard to both regional and local exchange.

Prior to this obsidian study little detail was known about how Caracol articulated with obsidian sources and sites nearby that were involved in regional trade and blade production. Many Maya sites in the southern and northern Maya lowlands have high amounts of obsidian blade and eccentric artifacts (Hruby 2007; Moholy-Nagy 2003a). Chemical sourcing studies at many of these sites indicate that particular sources were predominantly circulated northward into the lowlands (Moholy-Nagy et al. 2013). In the central Petén of Guatemala, western Mexico, and northern Belize, neutron activation analysis (NAA), x-ray florescence (XRF), and portable XRF (pXRF) sourcing studies show that El Chayal obsidian from the highlands of Guatemala was more widely available or traded northward compared to other sources like Ixtepeque in southern Guatemala (Aoyama 1996; Arnauld 1990; Braswell and Glascock 2007; Fowler et al. 1989; Healy et al., 1984; McKillop 1989; Moholy-Nagy et al. 1984; Moholy-Nagy et al. 2013; Nazaroff et al., 2010; Rice 1984; Stross et al. 1983). For example, Moholy-Nagy et al. (2013:89, Table 6) reports during the course of Tikal's history just over 90 percent (n=2,073) of obsidian came from the El Chayal obsidian source. This is in drastic contrast to a combined 6.9 percent (n=155) being imported from San Martin de Jilotepeque (5.4%, n=120) and Ixtepeque (1.5%, n=33).

Sites in Honduras, like Copan, show a greater proportion of Honduran obsidian sources such as San Luis/La Union and La Esperanza or other sources closer to Copan like Ixtepeque (Aoyama 1996). Aoyama (2001:348, Table 1) reports that Copan received 98.5 percent of its obsidian from Ixtepeque and only 0.3 percent from El Chayal. These two examples –Tikal and Copan – demonstrate an opposing procurement comparison where obsidian consumption was related to overall distance and established trade routes. Distance also affected the distribution of green Pachuca obsidian, from central Mexico. It is so rare at many Maya sites during the Classic period that it is thought of as a gift between elites and is often found in unique central Mexican-style ritualistic burials (A. Chase and D. Chase 2011; Johnson et al. 2011; Pendergast 1971, 2004; Spence 1996). Most green obsidian from Caracol reflects this pattern as well; however, almost half of the green obsidian blades at Caracol has been recovered from household refuse/fill contexts. This form of consumption and use suggests that not all obsidian from Mexican sources were used in elite rituals.

As a result of these data, regional obsidian trade is logically modeled where proximity to source or established trade routes along river courses are important elements in access to exotic goods (Demarest 2004:159, Figure 7.5; Demarest et al., 2014; Nazaroff et al., 2010:889). Although these models have significant support from existing data, even more data can be taken into account that contends with the demands of large populations residing in sites such as Caracol in eastern-central Belize. *Therefore, I investigate (1) which obsidian source is predominant in the Caracol assemblage, (2) how the exploitation of sources might change over time, and (3) what regional networks existed during the Classic period that help to explain the presence and/or absence of certain obsidian sources.*

Obsidian sourcing studies often link artifact types to material sources in order to better inform how obsidian was imported into sites (Aoyama 1999; Hirth 2006; Moholy-Nagy et al., 2013). For example, the presence of cortical macro-debitage in a local assemblage indicates that blade-core preparation took place at the site rather than another location closer to the obsidian source. Aoyama (1999) asserts that some obsidian imported into Copan came in the form of roughed out nodules that still retained a percentage of cortical material. Moholy-Nagy et al. (2013:78) in contrast state that, "The scarcity of cortex on debitage and finished artifacts indicates that all obsidian that reached Tikal had been worked to some extent." This lack of cortical material from Tikal may demonstrate that, although a massive consumer of obsidian, Tikal did not have access to roughed-out nodules that still retain cortical surfaces, but rather that obsidian was reduced elsewhere. Therefore, Tikal may only have had access to prepared cores but in great amounts. Because of the recovery contexts she reports on (Moholy-Nagy 1997), it is entirely likely that there is bias in her sample and that further excavations or additional analysis may reveal cortical materials; Caracol presents similar sampling bias. Notwithstanding, the Tikal and Copan data both provide opportunities for comparison, as both sites produced tens of thousands of obsidian artifacts.

In another example of this dimension of Mesoamerican - regional obsidian exchange - Hirth (2006) defines multiple workshops at Xochicalco, Mexico, none of which have macro core shaping debitage. This absence of cortical material and a high amount of blade-core rejuvenation debitage led Hirth to conclude that already reduced cores were imported into workshops, most of which were in need of platform rejuvenation. Hirth concluded that obsidian was likely funneled through sites where blade-cores were prepared, used, and exhausted, thus showing the politics and economics that affected regional trade and access at Xochicalco. This kind of relationship could have occurred in the Maya area as well.

Caracol most likely participated in obsidian trade networks alongside Tikal, Copan and many other sites as other artifactual materials have indicated. Is it likely that sites like Dos Hombres, Xunantunich, El Pilar, El Laton, and hundreds of others further north had their eventual supply of obsidian funneled through Caracol similar to what Braswell (2010) has suggested for Calakmul north of Tikal. Although this research does not aim to study the downstream impacts of Caracol as a “gateway site” for obsidian distribution to other sites per se – although ritual practices that included obsidian exposes shared regional connections – the current study does ask: *Did Caracol receive roughed out obsidian nodules that retained cortical material or receive prepared polyhedral cores that were either ready for blade removal or in need of rejuvenation?*

Caracol was a major consumer of a broad suite of materials, generally. The above questions situated within regional considerations helps to establish the necessary data by which to analyze obsidian's initial itinerary or movement from quarries through trade routes prior to any intra-site transformations at local workshops and subsequent circulations through potentially varied exchange mechanisms.

Domestic Crafting Economic Research Objectives: Chert and Obsidian

Lithic crafting activities and its role in the local Caracol economy is currently adding to the knowledge about Caracol. While only a few studies were conducted on the locally available chert, a complex picture of crafting organization is emerging where the sharing and learning of practice is wide-spread and not segregated by status group per se. Cynthia Pope Jones (1994, 1996) presented initial findings and interpretation of craft production and the materials involved. She was the first to seriously address the kinds of chert flaked stone tools involved in crafting and noted that many households reduced shell to make a variety of crafted objects for domestic use. Her broader interpretations regarding the social organization of craft production was that knapping locally available chert was standardized across many investigated households to produce small robust blade-like tools. These blade-like drill tools were commonly used at multiple residences to craft materials such as shell and bone.

Later, these same materials and organizational issues were addressed to better understand the standardized nature of tool production and used in the crafting process (Johnson 2008; 2014). Also, there was a need to better understand the nature of control of the crafting process, given that Pope (1994; see also Jones 1996) summarized data from far outside the site's city center, while my sample derived from intensive production at the 'Gateway Group' close to the site epicenter. Not surprising was that the morphology of the small chert blade tools, commonly referred to as ‘drills’, from both studies was highly standardized (Johnson 2008, see also Johnson 2014 for a summary). Standardization was observed in (1) the general method in producing short robust blades with high dorsal ridges, and thick striking platforms, (2) the choice to laterally and distally shape the blades to specific ratios of particular sides while also creating either a useful edge angle or an edge appropriate for backing into a haft, (3) the general method of use determined by the presence of macro-scale use-wear on the distal tip, and (4) methods of resharpening the distal end by removing a small pressure flake from the ventral surface. Due to this quantitatively specific understanding of chert tool form, the varied distance from the site’s core, and that these kinds of tools are commonly found in architectural fill contexts at many investigated residences, it has been suggested that these tools are evidence for the shared knowledge of tool production by many of Caracol’s residences (Johnson 2014; Johnson et al., 2015). Here the concept of ‘communities of practice’ is operationalized with archaeology (see Lave and Wenger 1991; Roddick 2009). The qualitative and quantitative data from areas that exhort control of production and distribution of crafted objects also shows that it is likely that knowledge of the tool production process was open to all residences regardless of status, wealth, or location.

Further studies of investigated households and ritual special deposits showed that, although these tools do appear highly standardized, chert blade production included many of the same technological choices in core preparation, blade production, and core maintenance seen in polyhedral obsidian blade production (Johnson et al. 2015; Johnson and Johnson 2016). Although similarities exist, the amount of blade removal was significantly less due to the smallness of the locally available chert nodules as well as the typical inclusions in the raw stone. Two major contexts show this evidence. The first was recorded in 2015 (A. Chase and D. Chase 2014a; Johnson et al. 2015) and showed that a modest residence, with only three low-laying structures – most likely supporting perishable structures – was a major consumer of local chert raw materials and learned the knowledge of two different kinds of blade production. The first observed method consisted of simply creating a striking platform on a nodule and then removing one to five blade-like flakes before the core was exhausted. These exhausted cores still retain cortical surfaces. The second observed method is much more complex in that a striking platform was created and blades were then removed from all around a core face, like that of obsidian polyhedral cores. Exhausted polyhedral blade cores along with platform rejuvenation debitage was found at this humble residence although in much lower numbers that the first method described (see Johnson et al. 2015:83).

The second context where this later method of chert blade production was encountered was during a reanalysis of the large chert assemblage from an elite tomb deposit. The deposit above the tomb's capstone in Structure A3 in the core of the city also included thousands of obsidian artifacts as well (see Chapter 6). The obsidian assemblage is presented below as part of this work and the chert assemblage is currently being written up for a later publication on flaked stone artifacts from Caracol (Johnson and Johnson 2016). Due to these somewhat unexpected finds and the opportunity for a reanalysis of a context that was excavated during the early years of the Caracol Archaeological Project (see A. Chase and D. Chase 1997), new perspectives and models are being developed about the organization of craft production during the

Classic period. Of similar importance, these kinds of tools have been recorded at a number of other sites. Sites such as Tikal (Puleston 1969) and those in the Belize Valley (Braswell 2010) show striking similarities in overall tool form, use, and contexts of recovery, all of which demonstrates how small chert tools can help to understand regional dynamics in the sharing and transference of crafting knowledge.

Although this work does not do more to engage the larger organizational issues of crafting at Caracol, except as it relates to obsidian blade-core reduction, this short review of chert flaked stone does demonstrate that crafting was a normal part of domestic activity both in and near the city's center as well as within distant settlements. Other forms of craft production also took place at Caracol, but the evidence and interpretations for this do not come from the investigation of actual workshops, but rather from proxy measures of production discerned from detailed recovery and recording of Caracol's many ritual contexts and associated construction fills (D. Chase and A. Chase 1998).

In terms of obsidian, we know through experimentation (Titmus and Clark 2003) that blade production was a highly skilled yet variable practice (Hirth and Andrews 2002). And, as stated above, standards can be more or less applied to how much blade output may come a single core. Although the intent of core reduction was to produce blades, different kinds of practices in core reduction and maintenance existed (Trachman 2002; Trachman and Titmus 2003). Research with Caracol's obsidian industry attempts to better fit Caracol within other studies of blade production and organization.

Mesoamerican obsidian scholarship has dealt with variation or standardization in blade production practices across the cultural landscape. Hirth and Andrews (2002) introduced a volume on the subject and stated that lithic analysts and those concerned with knowledge produced form lithic studies must implement a standard artifact classification scheme so that comparisons may be made across sites, regions, and time periods (see also Clark 2003). Hirth and Andrews (2002) additionally asserted that the implementation of a standard scheme would provide “a means of discerning a variety of behavioral decisions made by artisans during the production process.” To be sure, blade production is a varied process, especially given the physical nature of conchoidally fractured stone; thus, lithic analysts speaking a common analytical language is an essential first step in understanding cultural and technological factors that structured practice and enable assertions of transmitting knowledge. Obsidian lithic analysis research at Caracol was conducted to further these research directions. Thus, a foundational question asked of the obsidian collection is, “*Did Caracol’s obsidian crafters use a blade production technique different from or similar to previously recorded reduction techniques in other areas of the Maya region?*”

Evidence of obsidian craft production is present at many Classic period Maya cities in the southern and northern Lowlands (Ford 2004; Neives and Libbey 1976; Trachman 2002), but some sites show technical variations in obsidian blade production. Some of this variation might be due to the overall access to obsidian (Trachman 2002:118). These interpretations are based on observations of pecked and scored obsidian cores that represent a conservative blade production strategy to maximize blade output from a single core (Hirth and Andrews 2002:14).

Trachman (2002; Trachman and Titmus 2003) interprets a conservative reduction strategy that maximized blade output in northern Belize. She noted that a conservative method of pecking and scoring blade-core platforms maximized blade output and, because of this practice, obsidian may have been restricted and/or scarce resource in the southern Maya lowlands during the Early Classic period at Dos Hombres (A.D. 250-350 [Trachman and Titmus 2003:108]). Other nearby sites, however, do not display these types of variations and suggests obsidian was not restrictive or scarce, but that obsidian workshops may have been managed by secondary centers (Ford 2004), simply showing varied technical practice rather than restricted access to raw material.

Based on the cursory understandings of Caracol obsidian, and according to D. Chase and A. Chase (2014a), obsidian was consumed broadly by the local population. Because of this seemingly broad access to obsidian, *I argue that obsidian crafters at Caracol may have also practiced a conservative technique to maximize obsidian blade output*. This assertion is based largely on an argument that Caracol, like other sites, did not have regular access to obsidian raw materials through time; this hypothetical punctuated, model although not tested here, is conservative and may with additional study to be incorrect.

As stated above, Trachman (2002) working at Dos Hombres near La Milpa in the Belize Valley argues that a pecked and scored core technique was used to remove blades from cores and rejuvenate cores to maximized blade output due to unpredictability in availability of raw obsidian resources. The presence of macrocore shaping debitage would help to argue this point as well (Chapter 6) because macro-core shaping debitage indicates that larger nodules were available and imported rather than prepared blade-cores that have less material overall. If Caracol did have regular access to obsidian raw materials – as indicated by the presence of macro debitage – then a conservative reduction strategy may not have been necessary and Caracol obsidian crafters did not practice an alternative reduction technique following a broader Mesoamerican tradition of blade production that was not specifically conservative (see Trachman 2002).

Chapter 6 describes the kinds of artifacts recovered and the technical attributes that help to describe the choices made by obsidian crafters. Understanding the kinds or broad reduction strategies juxtaposed with the presence/absence of core shaping debris provides multiple lines of evidence to better understand if and why conservative or non-conservative reduction techniques were employed. Ultimately, the primary goal of the obsidian lithic analysis is to situate core reduction to produce blades and other non-blade objects within existing research. Testing for the presence or absence of conservative crafting techniques is just one method of engaging earlier detailed studies.

The above concerns with crafting practice (Chapter 5) and access to resources (Chapter 4) relate to the ways in which obsidian crafters were or were not managed by other status groups, as well as what role they may have played in ancient Maya society. The next part of the dissertation (Chapter 6) addresses the modeling of resource provisioning to the broader population. This research underscores the need to better understand the management or non-management of crafters by elites or other status groups/individuals. Because of this relationship, I review crafting models at Caracol vis-à-vis lithic evidence briefly to show how management or control of crafting practice by elites is not strongly supported and therefore helps to reinforce a decentralized model for the organization of craft production and resource provisioning through markets.

Household Provisioning Objectives: Markets and the Power of Crafters

Diane Chase and Arlen Chase (2014a) argue that most households likely either crafted and/or had access to many quotidian and ritual items through participation in various markets. Furthermore, like the distributions of goods, certain intensive lithic and shell crafting households in various locations inside and outside the city center suggests that crafting was possibly not a highly controlled elite activity (A. Chase and D. Chase 1994a; Johnson 2008, 2014; Pope 1994), but may instead reflect a general pattern of Maya household diversity (A. Chase and D. Chase 2015b; A. Chase and Scarborough 2014). Both intensive household multi-crafting and markets placed throughout Caracol – connected through roads during the Classic period – seem to provide significant evidence for a well-integrated economy (A. Chase 1998; A. Chase and D. Chase 2001, 2009; D. Chase and A. Chase 2014a). The wide distribution of markets is supported through multiple lines of evidence (D. Chase and A. Chase 2014a). (1) The *configuration* of many architectural features that may have functioned as open spaces for markets. (2) The *contextual* evidence of most investigated households (n= ≥118) yielded a diverse suite of both local and exotic (extra-local) goods and that household craft production was widespread (see also Johnson et al., 2015:79, Figure 1). (3) The *distributional* data from house groups showed that this diverse suite of goods was recovered “homogeneously” across the settlement area (200 sqkm [A. Chase et al 2014a; A. Chase and D. Chase 2016]). Finally, all these data combined showed that Caracol’s *macroeconomic* reach was vast and that regional connections enabled the supply of goods into Caracol’s markets (A. Chase and D. Chase 2012a).

However likely markets are in the Pre-Columbian past, the presence and dynamics of markets in the Maya area and Mesoamerican generally is a debated topic (Fienman and Garraty 2010; Garraty and Stark 2010). Shaw (2012:124), states that, “Marketplaces have been tentatively proposed at 14 major lowland Maya sites, dating from the Classic through the Postclassic periods [Calakmul, Caracol, Maax Na, Palenque, Quirigua, Seibal, Tikal, Xunantunich, Yaxha, Chichen Itza, Chunchucmil, Coba, Sayil, and Xcambo].” In many of these sites, market exchange is inferred through observing an even distribution of artifacts across a settlement area. Hirth (1998) developed this “distributional approach” to test for the presence of markets and to analyze elite control. This method assesses the end locations of where commodities were consumed – in households – and searches for the dispersed patterns of materials in household assemblages. Hirth (1998, see also Hirth 2006), like others in the Maya area (Dahlin 2009; Hutson et al. 2010), has systematically sampled a statistical majority of households from Xochicalco, Morelos, Mexico to validate the marketplace exchange interpretation. Likewise, Hutson et al. (2010) and Masson and Freidel (2012, 2013) operationalize this distributional approach to determine market exchange. They use physical features at sites (i.e., open spaces and stalls), while more quantitatively measuring equal ratios between local and exotic consumables (i.e., chert to obsidian) that crosscut different locations and status distinctions (Masson and Freidel 2013). A major finding of this research at three different sites (Chunchucmil, Mayapan, and Tikal) is that obsidian blade consumption ratios to other artifacts vary by status groups, yet most residences obtained obsidian (see also Meierhoff et al. 2012). Greater amounts of obsidian at higher status residences are thus most likely due to the increased purchasing power of elite or wealthy families (Hutson et al. 2010:92–93; see also Smith 1987). Taking these studies together, in addition to the observation that obsidian and other crafts were provisioned or consumed by most households, archaeologists now have the opportunity to position obsidian crafters within economic exchange and social production networks in a complex system of material and social engagement that includes markets.

At Caracol it is difficult to assign a *strict dichotomy* of high status or low status groups based on the known variety of different sized residential groups (e.g., A. S. Z. Chase 2017) and their associated material culture. Despite this difficultly, those who occupied the city's epicentral structures were likely members of the ruling elite community and were after buried with status objects. In terms of mass consumption of materials, Caracol's broader residential households far beyond the city center also exhibit access to like objects for similar purposes (e.g., polychrome ceramics in burials, obsidian eccentrics in caches). Their living spaces were more modest in size varying in number of architectural features. This characteristic may demonstrate subtle, yet measurable differences in status (A. Chase and D. Chase 2014b:8 Figure 2). Even though status differences are argued to exist, most of these residences still obtained proportional amounts of wealth related items, such as polychrome and regional trade ware ceramics, jadeite, and shell (D. Chase and A. Chase 2014a). Given the presence of these non-local objects in the broader settlement, it is currently unclear if obsidian consumption corresponds to certain status (or wealth) groups or if consumption is present at different sized residences across the site. Different sized households are measured by counting the number of raised mounds of structures on a given raised platform (see Chapter 6). The size of a given residential group is used in this research as a proxy for wealth (with the caveat that larger groups could also measure residential longevity). For example, those larger households can be argued to exhibit greater purchasing power when participating in local market exchange. These larger households may also be generationally older and well established local lineages. In contrast, those smaller residences – less wealthy and potentially not as generationally old – may still obtain a diverse suite of materials through markets, but did not obtain as much on average. Diane Chase and Arlen Chase (2014a) argue that a large middle status population had unrestricted access to exotic materials and that multiple local markets were the primary mechanism for provisioning the broader population, both for quotidian and ritual activities. Given these broad understandings of localized exchange, the current research can focus specifically on obsidian. *To what extent did markets influence the distribution of flaked stone and obsidian more specifically to all members of the population? If obsidian consumption was widespread, was there differential access to obsidian by assigned wealth as measured by residential size?*

Many scholars argue that market exchange caused obsidian distributions to be relatively equal at all households regardless of rank-status assignment – based on architectural size – and proportional to the distributions of exotic ceramics or other imported objects (Hirth 1998; Huston et al. 2010; Masson and Freidel 2013). At Caracol, D. Chase and A. Chase (2014a) provide general amounts/percentages and the research reported here aims to add detailed numbers and different statistical tests to the body of knowledge to more accurately account for whether or not obsidian circulated through markets, elite redistribution, gift-giving, or a combination of strategies and to determine if those with more purchasing power (i.e., those living in larger households) obtained more obsidian overall when compared to smaller, less wealthy groups. If we take architectural complexity (i.e. size) to be a proxy or general marker for wealth and therefore access (i.e., greater purchasing power) to resources, this research measures the degree of variations in obsidian consumption across a sample of large to small residences with the majority dating to the Late Classic period (AD 550-800).

First, I measure access to obsidian compared with the overall consumption of chert flaked stone. As both of these are commonly found in residential investigations and are normally blade tools (see above), comparing these items provides an opportunity to measure the locally available chert tool stone against the extra-local obsidian material. *Is there statistical difference in the ratios of obsidian to chert by architectural complexity (i.e., wealth)? Was obsidian exchanged through markets similarly to other tool stone materials?* To address these questions, I present and test three hypotheses pertaining to whether or not markets influenced the distribution of obsidian objects to households settled in all tested areas of the site. A first null hypothesis asserts *there is a significant difference in ratio amounts (obsidian:chert) between different sized groups. In other words, those larger groups or those possessing greater wealth, are expected to have a higher ratio or proportion of obsidian to chert because they could exercise greater purchasing power during exchange*. Alternatively, *There is no significance between group size and consumption ratio (obsidian:chert). In other words, the size of the group, a proxy for wealth, does not influence the proportion of different types of flaked stone obtained through exchange, implying that markets influenced the distribution of obsidian.* The result of this hypothesis testing is then spatially mapped across the site. If there is no statistical difference in the obsidian to chert ratio between residential size classes and these are randomly distributed across the site, then it is extremely likely that markets helped to ‘homogenize’ the landscape with relatively equal access to proportions of local chert and extra-local obsidian goods. To be sure, Caracol’s landscape is known as a complex mosaic of social activity, including crafting, agriculture, and ritual, but through these questions and distributional mapping we can further assert the connectivity of people, places, and things.

A second distributional analysis is used to test for the presence of marketplace exchange. Braswell (2010:132, Table 6.1), citing Hirth (1998), asserts that a market exchange system is present in the Maya area based on two observations: (1) the “quantity [of obsidian] at households is related to need rather than status; and (2) the “market homogenizes [obsidian] sources…at the community level.” The later assertion is tested by HHpXRF geochemical data. *If markets effected the distribution of obsidian, then the dominate sources of obsidian (e.g., El Chayal and Ixtepeque) should be evenly distributed across the sampled area. Alternatively, if sources are clustered or unevenly distributed, then perhaps obsidian was being procured through more restricted, non-market exchange mechanisms.*

A third test concerning markets explores the *mean amounts of obsidian* specifically, excluding locally available chert, by household size aimed at measuring wealth and general differences in access within a market bases exchange system. *In particular, if markets did effect the distribution of obsidian and household size (or wealth) is not a factor that influenced differential access, then we should see no statistically difference in mean obsidian consumption between households of different* *sizes*. In order to address these research objectives, I deploy a proxy for wealth by classifying residences into four groups modeled after previous research (A. Chase and D. Chase 2014b:8, Figure 2). *Pyramidal/Special Use Groups* (i.e., high status and royal) are those taller monumental groups clustered within Caracol's city center and those more modest residential groups close-by that appear to be workshops that are not organized like other households that exhibit structures arranged around a central open plaza. There are three other classes of groups defined by the number of raised structures atop a given platform that encircle a central patio or open space: ≥ *6* structures (i.e., high wealth); *5-4* structures (i.e., middle wealth), and ≤ *3* structures (i.e., low wealth).

Through demonstrating that markets may have played a critical role in provisioning households with obsidian, we can then position crafters within this form of exchange. Therefore, I ask, "if crafters were critical for suppling markets with obsidian goods, such as blades, *how can obsidian crafters be given greater agency (i.e., influence to affect change) through understanding how they may have operated to provision households?* Crafters could have cooperated directly with market managers or communicated directly with households in need of obsidian. In either case, if the distribution of obsidian is widespread, we must begin to consider the role and identity of obsidian crafters in ancient Caracol society.

Quotidian Use and Ritualization of Obsidian: Crafter and Household Interaction

House groups throughout the Maya area used obsidian for both domestic and ritual activities, yet earlier distributional data led some scholars to argue that access was restricted and controlled by elite or higher status groups (Rathje 1972; Sidrys

1976). With more obsidian being recovered since these seminal interpretations from beyond monumental civic centers, Mayanists now know that obsidian distribution and access was not restricted to only elites, but was widespread and accessible to households of varying social statuses (Braswell 2010; A. Chase and D. Chase 2014b; Hutson et al. 2010; Meierhoff et al. 2012; Moholy-Nagy et al. 2013; Rice et al. 1985:601). In particular, Caracol's house groups demonstrate that obsidian was both domestically used a tools and ritually included in cache offerings and in many burials (D. Chase and A. Chase 1998, 2014a), and data are now available from over three decades of research to quantify many of these associations in order to investigate to what degree obsidian pervaded household activities and timed ritual events. In particular, and in order to investigate household identity and the role of obsidian crafters, I focus largely on the ritualization of obsidian and to a lesser degree on quotidian practices.

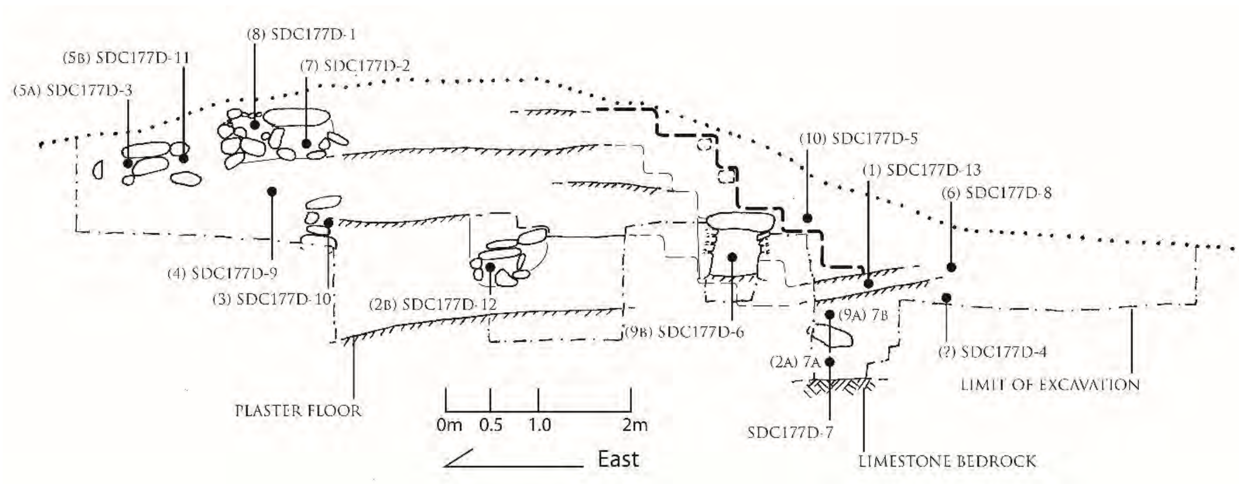
Obsidian use in quotidian or every day activities by most ancient Maya households demonstrates to what extent houses shared a common way of doing things. This common daily action can be measure through an investigation of tool type and the recording of macroscopic use-wear and potential tool sharpening or retouching. It may also show that households participated in the same networks of exchange to obtain stone tools. Therefore, I ask, "*do households that had obsidian show evidence of doing the same kinds of activities?"* In terms of quotidian activities, I investigate whether or not obsidian blades or other tools were used in similar ways by presenting macroscopic use-wear/retouch analysis of those obsidian objects recovered from construction fill and/or refuse deposits.

Likewise, ritual use of obsidian can be analyzed for the same reason. Evidence of ritual activity is commonly recovered during investigations of both monumental and household archaeological investigations and provides significant evidence for local craft production of both local and extra-local raw materials (e.g., D. Chase and A. Chase 1998). The sampling strategy at the site recovered significant numbers of caches and burials in monumental and household residences. Burial special deposits (S.D.) form the basis for: (1) human life histories, such as diet and individual identities; (2) the use of Caracol's eastern buildings in residential groups; (3) chronologies of pottery and other ceramics; and (4) the local production of personal adornments and related production debris. Caches provide much of the same data, but most often exclude the presence of human bone. In particular, caching at Caracol's households occurs in approximately the same frequency as human interments and caches often correspond to punctuated calendric events and/or mark significant locations (A. Chase and D. Chase 2010; 2013; D. Chase and A. Chase 1998). For the ancient Maya, rituals formed much of the backdrop for the formation and maintenance of their identity (D. Chase and A. Chase 2004) and therefore their political economy was embedded in the production and distribution of ritually used objects. Participation by crafters within a "ritual economy" – one where crafters fashioned objects specifically for distribution to residences for rituals – certainly elevated the status of those either doing the actual work and/or controlling production (Clark 2007; Hruby 2006; Inomata et al. 2001; Kovacevich 2007). Clark (2007) advocates for a practice theory approach where human action and intentionality is related to what it means to *do* specialized production at various scales, including how the identity of the crafter is tied up in their crafted objects (see Weiner 1992).

At Caracol, it seems as if the production and distribution of ritualized items was not exclusively performed by elites or somehow attached to elite management. Production and distribution of workshops form part of Caracol's household economic diversity (e.g., A. Chase and D. Chase 2015b; Cobos 1994; Pope 1994) and workshops are not typically spatially adjacent to elites or royals living in the city center (A. Chase and D. Chase 2001). House groups of varying size also exhibit wide ranging access to different materials. The GRB group investigated during the 2007 field season is an appropriate example to better understand the breath of access to materials and how household practices defined aspects of their identity through rituals (see A. Chase and D. Chase 2007a; Johnson et al. 2015). Table 3-1 shows a general inventory of materials from Special Deposits (S.D.s) and refuse and/or construction fill (i.e., non-S.D.'s) from the GRB group. Figure 3-2 shows the excavation section of the axial trench through the eastern building at the GRB group.

Table 3-1. The diversity of local and non-local materials from the GRB Group case-study north of Caracol's city center. Special deposits (S.D.s) most often consist of cache deposits and human interments. Non special deposits (Non-S.D.) most often consists of household refuse and/or construction fill contexts and make up the bulk of excavated space at Caracol.

Operation C177 Contents	Contexts			
Classification and Type	Special Deposits (SDs)		Non-SDs	
Local Stone	25		318	
Chert		15		314
Shaped Limestone		10		2
Quartz		0		2
Nearby Stone	6		42	
Slate		5		17
Granite		1		15
River Cobble		0		10
Distant Stone/Mineral	77		30	
Obsidian Blade		3		30
Obsidian Core (eccentric)		65		0
Jadeite		8		0
Malachite		1		0
Ceramic	-		-	
Vessels (whole/partial)		79		19
Shell	-		-	
Marine		146		6
Bone	-		-	
Faunal		11		19
Human Interment		7		0
Totals		351		434



Behavioral Sequence	Deposit	Description
1	SDC117D-13	Construction of Plaza floor, cache placed, then capped with next floor
2A	SDC117D-7A	Floors intruded and burial placed under 1st plaza floor
2B	SDC117D-12	Intruded into 1st structure and burial placed within
3	SDC117D-10	2nd phase of construction cut to place cache vessel and objects
4	SDC117D-9	2nd phase of construction cut to place cache vessel and objects
5A	SDC117D-3	Latest phase of architecture modified to house deposit
5B	SDC117D-11	Latest phase of architecture modified to house deposit
6	SDC117D-8	Latest plaza floor cut and two cache vessels placed within
7	SDC117D-2	Burial placed within latest phase of architecture
8	SDC117D-1	Latest phase of architecture modified to house deposit
9A	SDC117D-7B	Cache placed during modification of structure and deposited more vessels
9B	SDC117D-6	Stairs cut to construct crypt and then capped with latest stairs
10	SDC117D-5	Cache vessel with lid placed in association with latest stair
?	SDC117D-4	Human bone deposited in front of structure

Figure 3-2. Southern section of axial trench through the eastern building at the GRB Group. Numbers in parenthesis next to S.D. number correspond to the sequence of deposition. Areas around Special Deposits and in between floors represent construction fills and redeposited residential refuse materials. Image taken from Johnson et al. 2015:116, Figure 2.

However unlikely it is that elites figured into the management of craft production and distribution, intensive crafting did take place at a variety of locations throughout Caracol's settlement. And, although no obsidian workshop(s) have been located to date at Caracol, determining distribution and common use of certain items can provide proxy or indirect measures for how to examine the ways in which obsidian crafters articulated with the broader political and ritual economy. Therefore, I will examine to what extent research on the ritualization of obsidian helps address commonalities or differences in household identity and the potential role of obsidian crafters in Caracol's local political and ritual economy. *Did Caracol's households obtain the same kinds of ritual obsidian objects and were these practices shared among a wide variety of residences? How might understanding these shared or unshared practices better situate the role of obsidian crafters in Caracol's history?*

An Initial View of Caracol's Obsidian Artifacts

Previous investigations, both the within the city center and settlement areas of Caracol, explored the relationships between households of various size and status groups (e.g., Jaeger 1994). A significant amount of flaked stone, both chert and obsidian, was recovered and has enabled greater emphasis on relations between flaked stone crafters and consumers. Intensive work at many of the residential and monumental architectural constructions revealed secondary refuse deposits in the form of construction fills that yield significant evidence of intensive and standardized crafting activity of chert flaked stone (Johnson 2008, 2014) and, although workshop locales may be debated, it is very likely the same was true for obsidian based on numerous explorations of secondary contexts (e.g., large assemblages of obsidian production debris above three tombs). Large depositional contexts of obsidian and chert artifacts recovered in association with larger elite tomb chambers are seen at many Classic period Maya sites (Moholy-Nagy 1997). At sites such as Uaxactun, Río Azul, Lamanai, Altar de Sacraficios, Copan, Quirigua, and Buenavista del Cayo, this kind of deposit is found above and adjacent to large vaulted tombs (Moholy-Nagy 1997:306; see also Andrieu 2001). Moholy-Nagy (2011) argues that the presence of obsidian eccentrics above tombs in these larger deposits at Tikal could signal them as ritual offerings. She asserts that these large amounts of flaked stone were obtained through a redistribution exchange system in contrast to simply adding volume to structures during building efforts (Moholy-Nagy 1997, 2011).

At least three similar obsidian dumps were initially presented as summary finding by the Caracol Archaeological Project during the earlier years of investigations in or near the city center (A. Chase and D. Chase 1987). At the time there was little presented on the technological composition of these deposits, but it was clear that there was a diversity of chipped stone present, not just obsidian blades. During the re-analysis of these three contexts as part of this dissertation project, it was evident that a reduction sequence or profile could be reconstructed could illuminate local obsidian crafting practices. The same is true for the Dos Hombres above tomb deposit (see Trachman 2002).

The first above tomb deposit to be recorded at Caracol was during the 1986 field season. Part of Operation C12 explored the top of structure A3. A. Chase and D. Chase (1987:15) state the “excavation indicated that the interior bench has been a later addition to the structure to encompass and cover a tomb chamber had been intruded through the central doorway.” Although initial counts of this deposit recorded some 8,913 pieces of obsidian and 7,840 chert flaked stone artifacts, through refitting and re-analysis there was more conservatively at least 6,266 obsidian artifacts. The chert materials are currently being analyzed and final counts are not available. This tomb chamber included a single individual, other artifacts, and a painted capstone with a Caracol emblem glyph and a date of AD 695.

A second tomb chamber investigation at the Machete Group (Operation C19) during the same field season also exposed a layering of obsidian. Although far less obsidian was recovered, a wide range of debris was recovered. This tomb from within Structure L3 also included a painted capstone with a date of AD 613. A. Chase and D. Chase (1987:43) state,

> The contents of chamber were broken and strewn about its entire length. The tomb, however, proved to contain the remains of a single adult male, four pottery vessels, and a multitude of jadeite mosaic pieces. Red pigment was noted on the frontal bone of the individual. In the cut above the capstone, 435 pieces of obsidian were recovered; an additional 179 pieces of obsidian were within the tomb. Thus, the pattern of depositing freshly struck obsidian above the painted capstone which was noted over the Structure A3 tomb is also found, albeit on a smaller scale, in association with the Structure L3 tomb. This pattern has also been noted for Burials 24 and 116 at Tikal (Coggins 1975:373); the Caracol example in Structure L3, however, predates the appearance of this trait at Tikal by at least 60 years.

In total, 624 obsidian artifacts from this deposit were analyzed during the course of the current project.

Third, investigations at the base of Structure A34 at the Central Acropolis exposed yet another lens of obsidian associated with a tomb entryway. The lens of obsidian from this investigation (Operation C87) yielded 5,236 pieces of obsidian crafting debitage and blade-core fragments. Although the initial tomb construction dates to A.D. 577 or 582 based on text from a painted capstone (D. Chase and A. Chase 1996), the obsidian deposition occurred during a re-entry event some 100 years later (AD 682-700 (D. Chase 1994:138, Table 10.1, D. Chase and A. Chase 1996). This later date was assigned because of the ceramic assemblage (D. Chase and A. Chase 1996). The distribution of these three above tomb chamber deposits is shown in Figure 3-1.

Additionally, a fourth potential tomb deposit is far from the city center. Although explored sometime after Operation C87 during the mid-1990's, Operation C138 yielded approximately 96 obsidian artifacts. This is much less obsidian than the other deposits described above, but the kinds of obsidian artifacts recovered during the investigation of yet another tomb chamber were very similar. Given the type of excavation conducted at the Tres Grades Group during the 1997 field season, that did not expose the area above capstones, it is likely that continued excavations outside the tomb chamber would yield significantly higher quantities of obsidian.

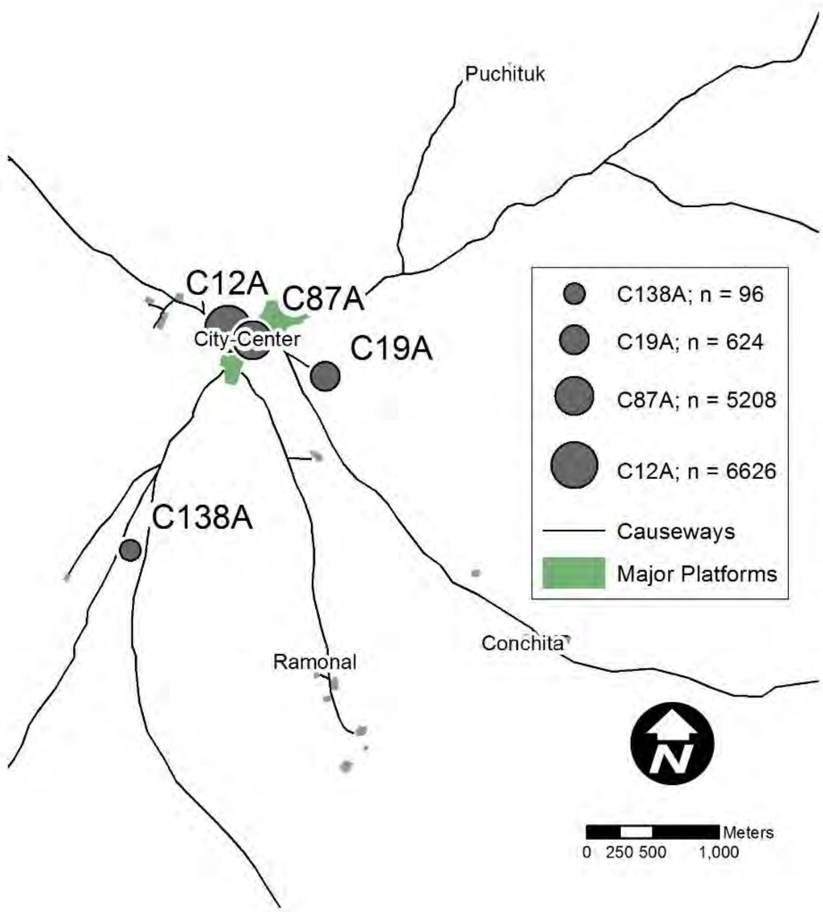


Figure 3-3. Distribution map showing the three burial associated obsidian deposits in and near the city center and one possible deposit located to the southeast. Numbers indicated the amount of obsidian recovered from these investigations.

In addition to these burial deposits, investigations at many eastern residential structures also recovered obsidian “eccentrics” from ritual caches. At Caracol, eccentrics were first recorded by Satterwaite in 1951 during excavations under Caracol's Altar 7 (A. Chase and D. Chase 1987:4). Arlen Chase and Diane Chase (1987:4) state, "This cache consisted of 3 vessels, 7 possible obsidian eccentrics, 2 jadeite fragments, 12 shell fragments, 8 pieces of pyrite, 1 stone bead, and hundreds of oddly colored stones." No other obsidian artifacts have been recovered from explorations of erected monuments, but are instead primarily recovered from caches placed on axis to eastern structures.

Maya eccentrics have long been studied in Mesoamerican archaeological literature and have been interpreted as an indication of social status differentiation because of their inclusion with high-status individuals at larger architectural complexes (Coe 1959; Iannone 1992; Iannone and Conlon 1993, Moholy-Nagy 1997).

In contrast to other studies that may assert eccentrics signify high status, explorations of both large and small residences at Caracol show that eccentrics were fairly common. Also preliminary analysis of eccentrics at Caracol and elsewhere shows this often-used term is misleading as it disregards the technological identifications of these objects that are recovered from distributed household contexts. Eccentrics may include pieces such as exhausted cores, notched exhausted cores, unifacially pressure flaked polyhedral cores, macro flakes, core platform rejuvenations, core sections, distal orientation flakes, and/or retouched blades (Johnson 2015).

The presence of technological diversity in eccentrics, coupled with attribute analysis and the possibility of refits, may show that exhausted polyhedral blade cores labeled eccentrics in the Caracol catalog even appear to be systematically destroyed prior to a ritual deposition (Clark and Bryant 1997; Hirth 2006:78). Most preliminary research that observed destruction or 'killing' of obsidian suggests that crafters could have performed this task in order to disable blade removal from blade-cores by positioning exhausted cores on an anvil and splitting them medially or laterally using indirect percussion. Other 'killed' obsidian blade-cores appear to have had their proximal, lateral, and distal margins removed to disable any further blade removal by both crafters and non-crafters. It is unclear if many or any of these killed or shaped exhausted blade cores, known as Maya eccentrics, were used as tools prior to being deposited in a ritual cache or other ritual context, but there is evidence to suggest stylistic continuity over time and space (see Chapter 6). This research considers the style and form of Caracol's eccentrics and how their general morphology may reflect habitual practices on the part of the obsidian crafters to curate and then destroy cores rather than to potentially fit some type of visual aesthetic or symbolic style. It may well be that the technological morphology and symbolic representations are linked and deserve more detailed attention (see Hruby 2007). And, because many blade-core fragments fit this general pattern of destruction through notching or removing proximal and/or distal ends of the core, it can be suggested that these should be defined as eccentrics that occur in burials at Caracol, although this context is less common than in caches.

In terms of the broader distribution of obsidian, a review of the Caracol season reports (caracol.org) shows obsidian is a typical component in Caracol archaeological investigations, D. Chase and A. Chase (2014b) noted that obsidian is present in nearly 90 percent of investigated architectural groups as well as some vacant terrain excavations. Further analysis of non-special deposit obsidian will be detailed and summarized in Chapters 5 and 7, but the intention here is to simply present initial understandings of the obsidian data that can be gleaned from published data, whether peer-reviewed or in season reports. Taken together, the current body of published data does show that obsidian was significant and often present in both ritual and domestic activities throughout the sampled contexts. The key point is the omnipresence of obsidian in nearly all investigations and the fact that the majority of the sample dates to the Late Classic period. Samples come from a broad array of physical features and contexts - household construction, refuse, and ritual deposits, as well as monumental contexts in the city's central architecture (and in some cases associated with erected monuments).

This work focuses on a more detailed presentation and discussion of how the obsidian industry and its agents articulate with the broader circulation of other crafted materials. For example, we do not know how Caracol articulates with other sites that obtain large amounts of obsidian. What are the geological sources of Caracol's obsidian? How will these data help to inform regional trade connections? There is also a need to understand what form obsidian was imported into Caracol – rough nodules, final polyhedral cores, or exhausted cores in need of rejuvenation. Regarding local crafts people, what were the strategies and knowledge of obsidian crafters to reduce the imported form to produce blades and eccentrics? In order to inform how crafters were involved within the local economy we need to better understand the nature of their technical and social organization within a proposed market economy. And finally, we may ask what can be said about the state of personhood, identity, and power relations crafters had with others while interacting in a complex web of social relations at a site with a population of 100,000 or more?

Exclusions and Limitations of the Research

Because this dissertation uses a previously excavated dataset to address a number of questions regarding the ancient Maya, I must outline a number of important caveats. First, this research is about the obsidian artifacts from Caracol and therefore will not include analysis of other types of material remains. Despite this exclusion, other materials will be referenced in a general way. For example, obsidian from ritual deposits are often recovered alongside ceramics and/or other objects made of chert, limestone, shell, slate, and jadeite. In particular, it is common at Caracol to find eccentric obsidians recovered from inside ceramic cache vessels or in association with these vessels and accompanied by jadeite, shell, and other material residues. In these cases, the assemblage – a suite of different materials situated in time and space – are critical to understand the potential meaning of obsidian. Because of the scope of analysis and research needed to evaluate just the obsidian, future research will have to detail how obsidian materials articulate with other types of materials and artifacts. The artifact assemblage from Caracol is simply too large.

Second, excavations at Caracol, like those from of other Maya sites, recover other artifacts besides those explicitly sought to help answer research objectives. Through nearly 34 years of exploration and systematic research, the Caracol Archaeological Project has recovered nearly 20,000 obsidian artifacts. Thus, the knowledge produced from this dissertation research must be considered within the understanding that interpretations of Caracol's blade production industry and those actors involved are possible only through an aggregate analysis. In other words, no single season or multi-year research program at Caracol could have resulted in a general understanding of Caracol's obsidian. A bulk analysis of nearly all of Caracol's recovered obsidian to date is therefore extremely important as it enables the opportunity to support or re-evaluate past interpretations based on other material and contextual analysis.

Third, no microscopic use-wear study was done on the collection for this dissertation research, although such a study is planned for the future. To prepare for such a study, artifact edge-damage was recorded and coded for invasiveness. Edge-damage, modification (retouch), and invasiveness refers to the extent to which an object was used by observing the presence or absence of macro-scale (10x-20x magnification) flaking, notching, and/or other damage to an otherwise unused fine margin of a blade (see Appendix H, *edge-modified tool*). Through relating edge-wear with contextual associations, this recording scheme was also employed to determine where utilized tools were discarded in comparison with unused objects (e.g., blades without edge-damage). This macro-scale analysis produces evidence for determining what part of the blades were utilized, how invasive that use was, and the final depositional contexts of these utilized tools.

Fourth, no obsidian workshop has been found at Caracol like the few recorded elsewhere (Neives and Libby 1976; Olson 1994; Puleston 1969). The presence of workshops is, however, very likely given the extent to which obsidian has been collected from about 200 household contexts. Also the objects collected from many ritual special deposits, such as burials and caches, shows that core shaping and rejuvenation debitage as well as exhausted cores were widely distributed to households. Basically, a full reduction sequence to shape and maintain cores for blade production can be inferred through an analysis of these types of contextual assemblages. In contrast to obsidian, shell and chert flaked stone crafting workshops have been investigated at Caracol and have yielded important information on the kinds of organization or production that were done, the materials modified, and the techniques used to craft (Johnson 2008; Pope 1994). It is anticipated that by focusing on obsidian through this research a better understanding of obsidian crafting and the most probable locations for workshops can be determined. Given the nature of reuse or the recycling of many obsidian crafting by-products such as exhausted cores and rejuvenation debitage in caches and burials, it seems likely that workshops were well kept and perhaps their residues erased as a result of this recycling practice. These issues will be explored at greater length in later chapters.

Fifth, possible limitations lie in accurately dating construction fills, refuse, and/or ritual contexts because dates were problematic or unavailable at the time of the research. Despite this potential shortcoming at some sites and the likelihood of it significantly changing interpretations, the bulk of recovery contexts date to the Classic period (AD 250-900). As D. Chase and A. Chase 2004 (see also A. Chase and D. Chase 1994b, 2001; A. Chase et al. 2011) have shown, the majority of the settlement at Caracol is contemporaneous to the Late Classic period. Despite the problems of dating construction fills, I am operating under the presumption that unless otherwise stated, items within construction fills referenced to as secondary refuse or some other non-ritual or non-special deposit are contemporaneous to the Classic and/or Late Classic period.

Finally, and because this project analyzed previously collected artifacts, not all artifacts were analyzed using the standard analysis scheme presented in Chapter 5. Due to time constraints, the 2015 season obsidian (C49D, C205-C208) is presented in analysis tables available on the (see Appendices F-L), but is not included in each of the chapters that follow. For example, these recently collected artifacts were unavailable during the sourcing study and were not calculated in understanding domestic and ritual activities. Approximately 1,724 artifacts were not analyzed during this research and a sample (n=426) of these is listed in Appendix F. The artifacts not included in Appendices G-L analysis tables still remain either (1) at the on-site Caracol laboratory facility, (2) in the Belizean Institute of Archaeology (IOA) curation facility, (3) as part of a rotating museum exhibit title “Maya: Hidden Worlds Revealed” currently on display during the analysis, or (4) were otherwise unaccounted for during the course of this research project. In a few cases, greater counts were recorded during initial cataloging and counts were reduced after subsequent refitting of broken fragments. Although these artifacts are not presented specifically in later chapters, some will be referenced in interpretative discussions. Again, the total unanalyzed obsidian is approximately 1,724 pieces, representing less than 10% of the collection. Thus the conclusions drawn from this analysis of 17,868 are not expected to change, but rather to be reinforced had the remaining pieces been analyzed.

CHAPTER 4
SOURCING AND MOVING OBSIDIAN INTO A CITY

Significance of Obsidian Sourcing

Chapter 4 summarizes the importance of obsidian sourcing in the Maya area as well as explores the type of obsidian artifacts by source, the spatial distributions of obsidian sources that are present at Caracol, and finally discusses the temporal changes in the sources imported into Caracol. This last area will also position technological class and artifact type into discussion to better understand when particular crafting practices first began and which obsidian sources were first utilized for these practices. For example, when did local blade production first begin and did these crafting practices appropriate one or multiple obsidian sources? Was blade production continuous during all of Caracol's periodic divisions and did obsidian sources stay consistent over time in terms of provisioning local crafters for these specific practices?

Recording geochemical elemental data on obsidian artifacts, assigning an artifact's technological description (e.g., blade, blade-core), and mapping them temporally and spatially allows for the investigation of the beginning stages in the itinerary of obsidian. Elemental data tells us about the likely places where the raw material was quarried (Figure 4-1). By correlating these data with an artifact's technological description we can begin to see what form these materials took before being imported into a site (e.g., nodule, prepared core, biface) and which sources of obsidian were predominately used for certain purposes (i.e., El Chayal obsidian for blade production). These data also help to reinforce existing trade route models or provide an opportunity for their revision (see Demarest et al. 2014).

Obsidian sourcing studies in the Maya area continue to contribute to regional macro-political economic models of exchange (Arnauld 1990; Braswell and Glascock 2007; Ford et al. 1997; Fowler et al 1989; Golitko and Feinman 2015; Hammond 1972; Healy et al. 1984; Moholy-Nagy 1999, 2003b; Nazaroff et al. 2010; Rice 1984; Sidrys 1976). In his review of obsidian studies in Mesoamerica, Clark (2002:36-37) argues that archaeologists cannot simply connect the dots between sources and sites using specific sources; more information is needed. Trade routes are dynamic social and physical features that require human locomotion, knowledge of the landscape, communication, cooperation, and the ability to politically control resources. Some sites seem to be located at specific confluences where non-locally available materials were funneled. Braswell (2010) argues that based on the near paucity of obsidian at Calakmul and the "millions" of obsidian artifacts reported from Tikal (Moholy-Nagy 1994, 1997, 2003), it is very likely that Tikal was controlling the distribution of obsidian as it moved northward. Demarest et al. (2014) also asserts that because of Cancuen's location along the Rio Pasion, south of Tikal, in a transition area where local jadeite and obsidian production was intensive, Cancuen was a major power broker and focal point for regional trade. A large obsidian cache at Cancuen recovered from below a plain stela dating to the eight-century shows Cancuen had ready access to exotic raw materials from the Guatemalan highlands (Demarest et al. 2014; Urquizú et al. 2013). The amount of blades produced from these cores far exceeded local demand. Due to the depositional context near elite areas, Demarest et al. (2014) claim that both local production and regional exchange of obsidian blades was under elite supervision and control. To be sure, the Rio Pasion and sites located along this route were important for circulating goods from the highlands to the lowlands, but the nature of local production and regional exchange by elites is debatable, especially as other sites in the lowlands (as well as earlier Maya sites) yielded larger deposits of obsidian not necessarily associated with elites (Olson 1994; Neivens and Libby 1976).

Other sites that exhibit larger obsidian dumps (see Aoyama 1999; Moholy-Nagy 1997; Olson 1994; Trachman 2002) do highlight the diversity in the depositional context of obsidian blade production by-products. They also demonstrate that many sites throughout the Maya lowlands had access to obsidian blade-cores and not necessarily only to blades presumably imported from other sites of production. Sites with abundant amounts of obsidian spread throughout the Maya area do not support some older regional trade models (Sidrys 1976). Obsidian dumps or redeposited workshop refuse are discussed further in Chapter 8, but they are relevant in discussing regional trade as a dynamic process where making correlations between elite control and extra-local resources should be tested rather than assumed. However, as more data are recovered models will certainly change. In addition, these dumps do provide useful contexts to better characterize through which routes specific sources of obsidian were circulated. For example, Aoyama (1999) used neutron activation analysis (NAA), XRF, and visual characterization to show that most obsidian from Copan was coming from the nearby Ixtepeque source (~90%) and far less from the more distant El Chayal source (~10%). Other sites in the southern and northern lowlands, however, show a stronger association with the El Chayal obsidian source (~90%) and less so with the Ixtepeque source (~10%) during the Classic period (Meierhoff et al. 2012; Moholy-Nagy et al. 2013). This contrasting distributional relationship is likely due to the kinds of trade routes that traversed the rivers of the central Petén and those that navigated the

Motagua Valley (Demarest et al. 2014; Hammond 1972; Nazaroff et al. 2010).

The use of XRF and more specifically pXRF has brought archaeologists increasing amount of obsidian geochemical data. Neophytes as well as trained analysts are rapidly generating datasets at unprecedented scales and therefore increasing attention to the suite of devices, methods, and methodological transparency that exists between analysts (Shackley 2011). With this increase in data production and presentation, a regional trend of lowland Maya obsidian trade has emerged and been largely reinforced. Nazaroff et al. (2010:888) summarize this general temporal model as follows,

> In general, in the southern Maya lowlands, San Martin Jilotepeque was commonly traded during the Middle Preclassic (100-400 BC), but declined in use during the Late Preclassic through the Terminal Classic periods (400 BC to AD 900) when El Chayal became the dominate source, only to be overshadowed by Ixtepeque during the Post Classic (AD 900-1500).

More recent data from Tikal in Guatemala (Moholy-Nagy et al. 2013) and Chan in Belize (Meierhoff et al. 2012) also support this general trend with the exception of the Postclassic. Many sites in the southern lowlands were either abandoned in the Postclassic or have not produced datasets comparable with the Classic period. Even though data from the Postclassic is somewhat lacking in the southern Maya lowlands, trends at Tikal and Chan do show a slight decline in El Chayal and an equally slight incline in Ixtepeque indicating that this change may have begun to occur before these sites were abandoned. Caracol participated within these same regional trade networks from 200 BC through AD 900 and therefore trends in obsidian source changing through time offer confident cases for comparisons. Sourcing obsidian to specific obsidian quarries in the Maya and non-Maya regions presents an opportunity to continue to test dominant models of exchange while amassing unprecedented geochemical data using nondestructive HHpXRF.

Returning to the organization of this obsidian research program, an itinerary approach requires that another level of data be juxtaposed with XRF sourcing techniques to better understand relations of regional control. Specifically, following obsidian from sources to sites must take into account raw material form to understand those involved in material transformations before, during, and after obsidian was exported from a quarry. For example, would assertions of elite control need revision if those elite that managed blade producers only had access to nearly exhausted cores that were in need of immediate rejuvenation (see Hirth 2006)? Were sites such as Cancuen receiving nodules directly or already reduced blade-cores? This would significantly change output estimates and assertions that Cancuen was a center of gravity for the region. Cancuen may have had a subsidiary relationship with another site that would have previously removed a significant portion of blades. Large, politically important sites appear to only have access to prepared macrocores or pressure cores rather than rough nodules. While Tikal does not exhibit cortical macro-core shaping debitage (Moholy-Nagy et al. 2013:78), Aoyama (1999:141, Figure 8.9 and 8.10) shows that some cortical material from Ixtepeque did reach the Copan Valley. Some of the absence of these kinds of core-shaping debitage and/or cortical material at some sites could be accounted for by broader sampling. The presence of large obsidian dumps shows that ancient Maya obsidian crafters did manage production waste and that this waste was ritualized starting as early as the Early Classic in northern Belize (Trachman 2002) and perhaps during the same time and later from the Classic period in the central

Petén (Moholy-Nagy 1997). Moholy-Nagy (1997:306) states that lithic deposits of both obsidian and chert are present in association with eight elite interments at Tikal and similar contexts at seven other sites.

What these kinds of deposits, in conjunction with technological and sourcing studies, begin to show is that Maya obsidian moved over vast distances and had a highly fractal or transformative route before being deposited. It was part of a series of regional and local relationships that likely defined parts of life for many different social levels of society. This chapter will further engage with the above literature and dynamics of ancient Maya society as it pertains to the regional circulation of obsidian using Caracol as a case-study.

Data and Methods

X-ray florescence (XRF) methods have been useful in assigning artifacts to obsidian sources in Honduras, Guatemala, and Mexico using ten elements: Manganese (Mn), Iron (Fe), Zinc (Zn), Gallium (Ga), Thorium (Th), Rubidium (Rb), Strontium (Sr), Yttrium (Y), Zirconium (Zr), and Niobium (Nb) and most published studies assign artifacts to geochemical obsidian sources using Fe, Rb, Sr, Y, Zr, and Nb. Because of previous research in the Maya area by other scholars (Nazaroff et al. 2010), I use elements Sr, Zr, and Rb specifically to assign artifacts to geochemical sources; these elements have proved the most useful in distinguishing between Mexican, Guatemala, and Honduran obsidian geochemistry. While I focus on three elements in particular I do provide part per million (ppm) quantities of other elements (see Appendix C). Using most other elemental quantities in combination with Sr, Zr, and Rb would also confirm the results presented below.

All of the artifacts included in this sourcing study were also assigned approximate dates then situated within one of Caracol's seven temporal periods: (1) *Late Preclassic 1*, ca. 300 BC – 50 BC; (2) *Late Preclassic 2*, 50 BC – AD 200; (3) *Early Classic 1*, AD 200 – 350; (4) *Early Classic 2*, AD 350 – 550; (5) *Late Classic 1*, AD 550 – 700; (6) *Late Classic 2*, AD 700 – 800; and (7) *Terminal Classic*, AD 800 – 900. These assignments permit the exploration of temporal or periodic changes or continuities in obsidian obtainment.

The Caracol obsidian sourcing study assayed both artifacts and source samples using only one handheld portable energy-dispersed XRF (HHpXRF). A Bruker Tracer III ED-HHpXRF serial number T3S1330 from the University of California Berkeley, Archaeological Resource Facility (ARF) was used by the author to assay 1,786 available artifacts during 2013 through 2016. Each artifact and source sample was at least 3mm in thickness and in many cases samples were >8mm thick. Sample thickness can affect the peak intensity of the beam as it is returned to the instrument detector (Davis et al. 2010; Ferguson 2012; Frahm 2016; Hughes 2010). An adapted method of elemental ppm ratios, not Compton peak net counts per second, was calculated and plotted to help correct for differing beam intensities returning to the X-Ray detector due to thinner samples (see Hughes 2010). Compton net peaks are provided in Appendix C and a post ppm analysis using these Compton peak ratio data for the same elements reproduced the analysis of ppm quantitative data. In addition to correcting for artifact thickness, an RGM-2 USGS pressed pellet sample was assayed before each scanning session (see Table 4-1). The use of this pressed pellet sample not only helped to determine the possibility for detector drift, but also ensured the reproducibility of the results presented below and the reliability of the ppm calibration equation (see Bruker white papers).

The sampling strategy was both stratified and random. Each investigated operation – or general excavation - was sampled by pulling at least a 10% sample of artifacts. When different types of artifacts were present, I made every effort to assay at least 10% of each type; therefore, a wide diversity of artifacts types were included in the HHpXRF study. In many of those operations that had less than ten pieces of obsidian, each was scanned unless too thin to return a signal back the instrument's detector (artifacts typically less than 2mm thick). Future research will incorporate very thin artifacts into the sample methods as new methods have been proposed to determine sources for this artifacts (see Frahm 2016).

When encountering obsidian from special deposits – burials and caches – each artifact was assayed unless not all artifacts from a given special deposit was available or if they were >2mm thick. These un-assayed artifacts were either on loan elsewhere or were not part of the original export permit by the IOA of Belize. In total, 1,768 obsidian artifacts were assayed using an HHpXRF instrument. Future research plans to scan a minimum of 20 percent of the entire assemblage.

Also assayed during the study was a source library loaned from the Missouri University Research Reactor (MURR) and the ARF (Table 4-1). These included 12 sources provided by MURR (El Chayal n=5, Ixtepeque n=4, San Martin Jilotepeque n=5, Zaragoza n=5, Paredon n=5, Otumba n=5, Pachuca n=5, Tulancingo n=5, Zacualtipan n=5, Ucareo n=5, Cerro Varal n=5, and Fuentezuelas n=5) and one source from the ARF (La Union n=3). These source samples on loan were assayed on the same HHpXRF to ensure internal instrument consistency. Once these source samples were scanned they were returned to MURR and the ARF storage. Figure 4-1 shows the approximate location and distribution of these obsidian sources.

Figure 4-1. Obsidian sources used in study and mentioned in text.

Each artifact (n=1,768) and source sample (n=62) was assayed at 40 kV and 12μA for 180 live seconds with a 10mm2 X-Flash detector (resolution approximately 145 eV at 2000,000cps) using a filter composed of 6 mil copper, 1 mil titanium, and 12 mil aluminum (see Nazaroff et al. 2010 for similar methods). A series of mass quantitative calibrations to ppm was performed using the GL1 calibration macro in Microsoft Excel developed by Bruker Elemental in conjunction with MURR (Speakman 2012). The raw spectra files, calibrated ppm data, and the Compton peak net counts per second are available for download and comparison (Appendices B - D).

A series of standard bivariate and ternary plots show the source geochemical distributions using elements Sr, Zr, and Nb (Figure 4-2, Figure 4-3, and Figure 4-4). Initial organization of the ppm included constructing the source sample bivariate plots (Figure 4-2) and then overlaying artifact scans on source samples (Figure 4-3). Due to the variation in thickness and irregular surface of artifacts, some samples were closely aligned with more than one source. Other plotting methods that used ratios of elemental ppm (Rb/Sr/Zr) were then used to confidently assign artifacts to source samples (Hughes 2010). Figure 4-3 shows those artifacts that are outside a 95 percent confidence ellipse for El Chayal, San Martin (de Jilotepeque), and Ixtepeque. Pachuca obsidian artifacts also exhibited a wider geochemical variation when compared to the source samples provided by MURR (Figure 4-3 and Figure 4-4, bottom right). This is an expected outcome as sub-sources have been recorded at the Pachuca obsidian source (Glascock, personal communication 2015).

The La Union source samples and single Caracol artifact also exhibited a wide variation in geochemistry. The single La Union artifact from Caracol, an obsidian pebble about 1.5cm in diameter with nearly 100 percent cortex, overlaps slightly with the confidence ellipsis of Ucareo, a Mexico obsidian source. Despite this overlap and the combination of artifact morphology and geochemistry it is very likely that this artifact is from the La Union obsidian source in northwestern Honduras (Glascock, personal communication 2015). These types of obsidian pebble objects have been recorded by Joyce (1985) during her dissertation field work in the proximity of the La Union obsidian source and in subsequent work in the area (Joyce et al. n.d, Hendon 2004, 2009).

These small pebbles (≤3 cm) are described as originating and eroding from ash flow tuff eruptions near the site of Cerro Palenque, Honduras and are named after the modern town of La Union (Joyce et al. n.d.). Of the three La Union obsidian source samples, two were obsidian pebbles like the Caracol artifact. These objects are common from certain types of volcanic landscapes and often erode out of obsidian flows or are ejected short distances during eruptions. At the time of this research this is the only La Union obsidian artifact cited in the Maya lowlands outside Honduras and it also one of the earliest known obsidian artifacts recorded at Caracol (see below). It is currently unclear why this kind of object was imported into Caracol.

Figure 4-4 shows a Sr and Zr bivariate plot for only the artifact HHpXRF assays. Note that the vast majority of artifacts can be assigned to the El Chayal obsidian source (n=1,595, or 90%). The ternary plots (Figure 4-5, Figure 4-6, and Figure 4-7) better demonstrate and reinforce which obsidian sources are present in the Caracol sample. The ternary plots show a comparison to three elements (Rb/Sr/Zr). This ratio helps to assign artifacts to sources when those artifacts are relatively thin (<4mm) and do not provide the same return beam intensity like that of source samples back to the HHpXRF detector (see Ferguson 2012; Hughes 2010). All raw spectral data, calibrated ppm, bivariate and ternary plots, as well as initial source assignments were shared with the Archaeometry Laboratory at MURR. The source assignments were later confirmed by senior scientists (Ferguson and Glascock, personal communication 2015). The findings by artifact typology are discussed in the next section as well as the spatial and temporal shifts in overall obsidian importation into Caracol.

Table 4-1. Summary ppm data for all source samples scanned with HHpXRF. Table modeled after Meierhoff et al. (2012:275, Table 14.1). A sample of RGM-2 (n=5), both *calibrated* with the Bruker method and *recommended* from USGS, is included for greater transparency.

Source Sample	Reference Library		Mn****	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Present at Caracol
Cerro Varal	MURR**	mean	404.42	6987.12	40.70	19.00	12.02	127.98	73.52	23.28	120.92	17.04	X
		σ	49.03	471.18	5.86	2.53	1.55	5.44	5.82	1.59	7.54	0.42	
El Chayal	MURR	mean	603.06	6154.84	43.64	17.70	10.10	139.52	132.56	18.58	104.18	10.56	✓
		σ	115.43	208.69	11.37	0.67	1.70	4.64	6.85	1.69	3.09	0.51	
Fuentezuelas	MURR	mean	205.80	14344.58	148.26	24.24	20.36	171.26	1.26	97.32	611.26	34.22	X
		σ	75.20	203.38	6.45	1.86	2.35	4.45	0.36	1.13	4.03	1.68	
Ixtepeque	MURR	mean	419.48	9148.73	43.95	20.40	7.68	99.70	145.65	18.13	160.65	9.65	✓
		σ	36.76	257.25	3.74	1.36	2.12	2.21	7.89	1.02	6.98	0.47	
La Union	ARF***	mean	451.17	7919.70	47.20	17.67	11.33	129.93	38.47	24.07	141.37	16.40	✓
		σ	143.43	433.70	7.20	1.34	2.15	11.96	6.38	4.35	6.13	2.36	
Otumba	MURR	mean	400.78	8865.70	49.54	19.12	10.06	123.58	118.14	21.80	135.96	12.44	✓
		σ	22.72	363.74	6.97	2.36	1.08	5.08	6.16	1.32	3.07	1.23	
Pachuca	MURR	mean	1049.54	15709.02	208.36	23.46	20.48	194.32	3.62	109.20	890.56	87.98	✓
		σ	78.78	180.37	6.00	1.18	1.58	2.27	0.66	2.87	2.62	0.88	
Paredon	MURR	mean	363.98	8776.44	62.12	21.98	17.20	164.54	4.34	48.12	200.74	41.40	X
		σ	27.57	316.51	1.89	1.65	1.23	7.18	0.74	3.12	8.88	2.27	
San Martin*	MURR	mean	553.46	6510.04	46.78	18.12	7.80	108.62	172.06	15.28	110.00	8.76	✓
		σ	28.08	153.34	2.76	1.02	1.50	4.10	3.63	1.62	2.60	1.38	
Tulancingo	MURR	mean	435.50	18443.06	185.72	24.02	12.76	125.52	13.22	92.98	684.98	45.60	X
		σ	46.87	706.21	13.31	1.95	1.37	4.70	1.00	4.36	31.07	1.31	
Ucareo	MURR	mean	207.98	7569.18	43.88	19.52	12.78	150.10	10.48	25.64	115.08	13.94	✓
		σ	17.48	119.52	8.86	1.21	1.23	5.71	1.12	0.88	3.29	0.66	
Zacualtipan	MURR	mean	183.40	10583.60	48.32	22.66	32.20	281.82	35.78	45.96	213.26	19.16	✓
		σ	26.13	551.48	3.61	2.20	1.93	8.64	2.38	2.39	4.35	1.47	
Zaragoza	MURR	mean	262.98	9594.58	45.90	21.90	17.20	137.60	25.76	31.88	189.28	17.46	X
		σ	29.33	342.56	5.81	1.08	1.79	4.60	1.85	1.80	8.45	0.69	
RGM-2 (measured)	USGS	mean	290.93	11934.02	40.91	16.15	11.76	138.32	95.64	24.22	201.91	9.25	-
		σ	67.89	254.17	4.80	2.30	2.12	2.34	1.62	2.05	5.24	0.89	-
RGM-2 (recommended)	USGS	actual	273	-	33	16	-	147	108	24	222	9	-
		±	8	-	2	1	-	5	5	2	17	-	-

*San Martin de Jilotepeque, **Missouri University Research Reactor, ***Archaeological Research Facility, UC Berkeley, ****All spectra calibrated to produce parts per million (ppm) using the GL1 method preinstalled on Bruker handheld portable energy dispersed XRF unit with serial number T3S1330

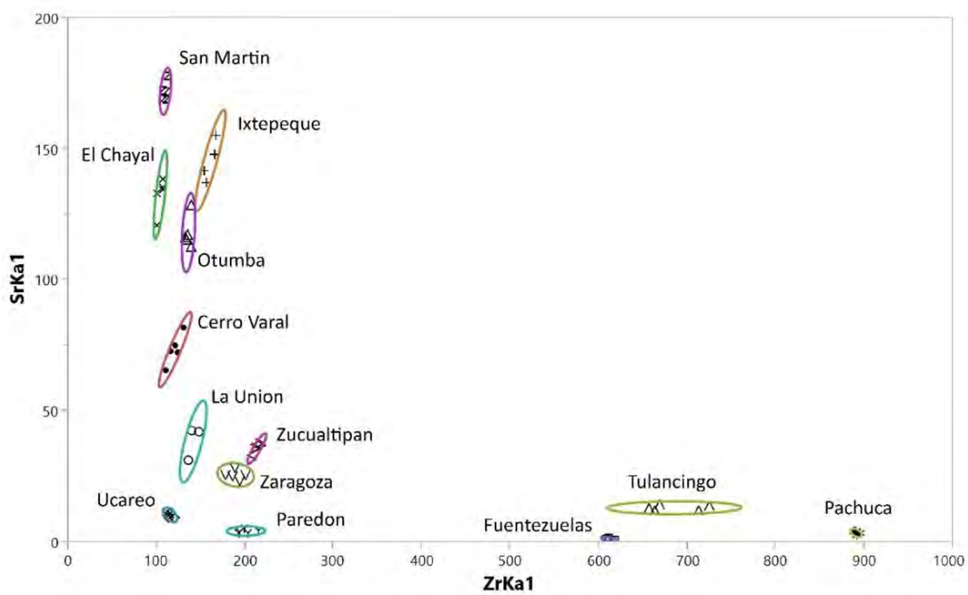


Figure 4-2. Strontium and Zirconium bivariate plot of MURR (Missouri University Research Reactor) and ARF (Archaeological Research Facility at UC Berkeley) source samples with 95% confidence ellipses.

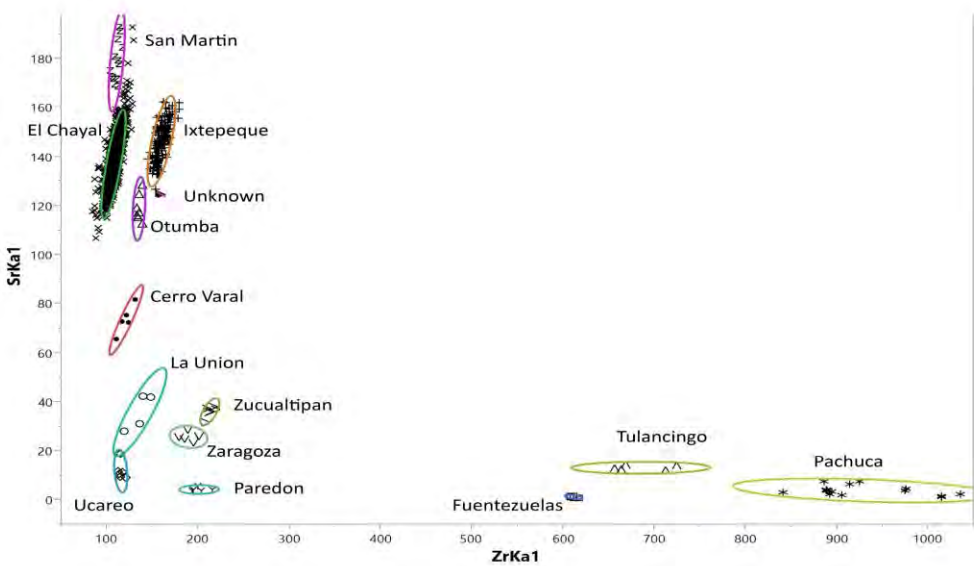


Figure 4-3. Strontium and Zirconium bivariate plot of all obsidian source samples (Table 4-1) and all Caracol artifact samples with 95% confidence ellipses.

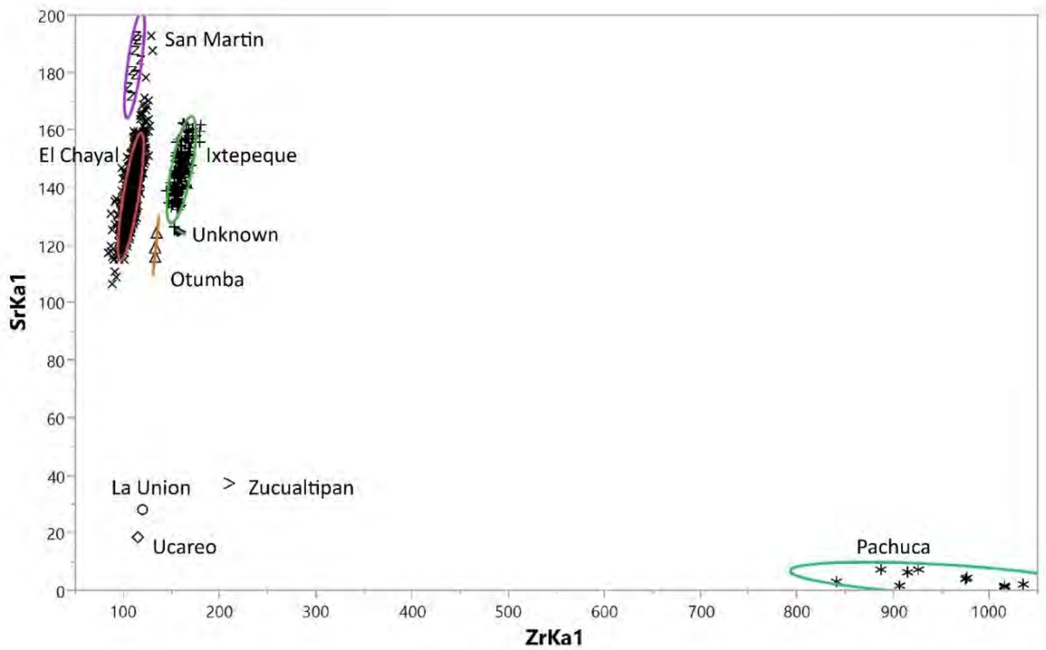


Figure 4-4. Strontium and Zirconium bivariate plot of only Caracol artifact samples with 95% confidence ellipses.

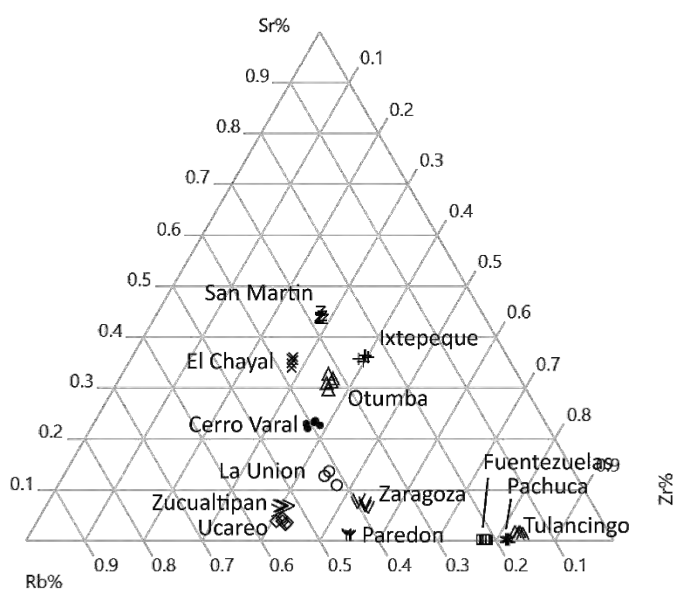


Figure 4-5. Rubidium, Strontium, and Zirconium ternary plot of all obsidian source samples available for study.

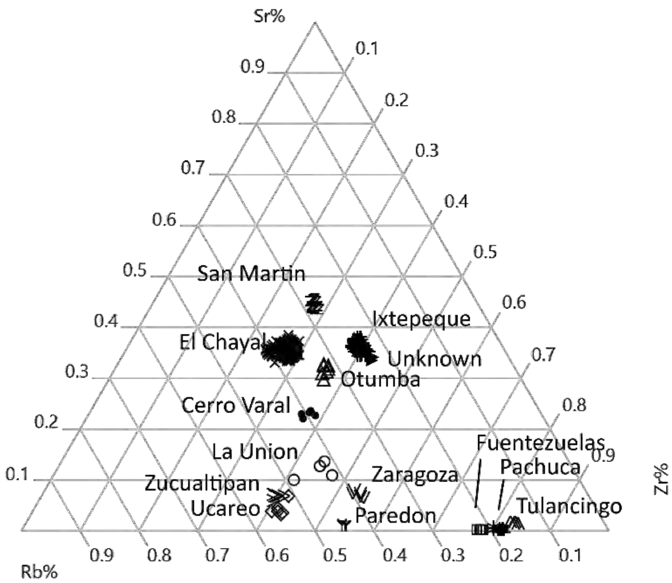


Figure 4-6. Rubidium, Strontium, and Zirconium ternary plot of all obsidian source samples and all Caracol artifact samples.

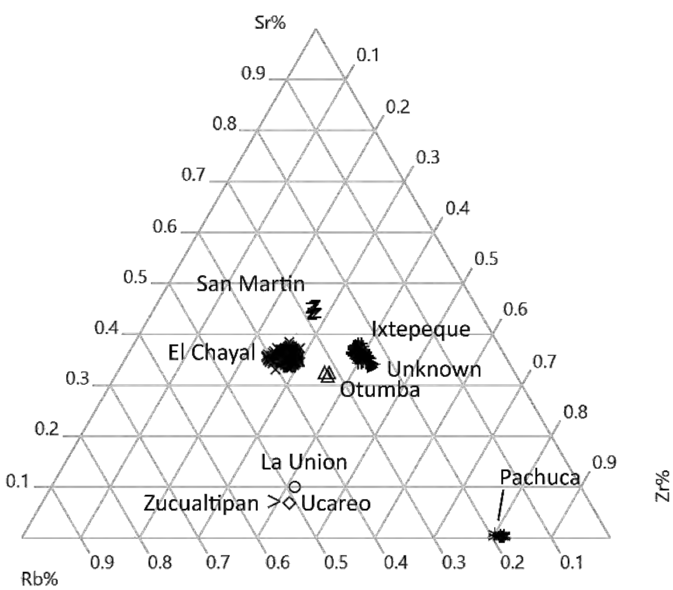


Figure 4-7. Rubidium, Strontium, and Zirconium ternary plots of only Caracol artifact samples.

Obsidian Source by Artifact Type

As stated above a ten percent sample of obsidian was taken with regard to quantity by archaeological operation and by technology type whenever possible. The resulting sample is presented in Table 4-2 and the distribution of artifact type by source is shown is in Figure 4-8. Blade-core shaping debitage (n=247) makes up nearly 14 percent of HHpXRF sample and includes a variety of debitage with and without cortex. Because some of these debitage are the only pieces to have cortical material on them, they help to understand how and in what form some sources of obsidian were coming into Caracol. El Chayal obsidian was imported into Caracol with some amount of cortex when compared to other sources. Core-shaping macro debitage from Ixtepeque is present and therefore Ixtepeque obsidian too may have been imported in the same roughed out macrocore form, like El Chayal, although in far fewer amounts. No Ixtepeque obsidian included in the HHpXRF study exhibited cortex and therefore may indicate the geological nature or different quarrying techniques of Ixtepeque obsidian.

Table 4-2. Artifact Type by Obsidian Source

Technology	El Chayal	Ixtepeque	La Union	Otumba	Pachuca	San Martin	Ucareo	unknown	Zacualtipan	Total	%
Blade-core shaping debitage	231	16	0	0	0	0	0	0	0	247	14.0
Macroblade	33	1	-	-	-	-	-	-	-	34	
Macroblade with cortex	4	-	-	-	-	-	-	-	-	4	
Macroflake	37	9	-	-	-	-	-	-	-	46	
Macroflake with cortex	16	-	-	-	-	-	-	-	-	16	
Object from macroblade	1	1	-	-	-	-	-	-	-	2	
Object from macroflake	1	-	-	-	-	-	-	-	-	1	
Small percussion blade	43	-	-	-	-	-	-	-	-	43	
Small percussion flake	96	5	-	-	-	-	-	-	-	101	
Rejuvenation debitage	445	16	0	0	0	0	0	0	0	461	26.1
Core section flake	53	2	-	-	-	-	-	-	-	55	
Cortical core-top	11	-	-	-	-	-	-	-	-	11	
Distal orientation flake	109	3	-	-	-	-	-	-	-	112	
Faceted core-top	7	1	-	-	-	-	-	-	-	8	
Faceted/striated core-top	7	-	-	-	-	-	-	-	-	7	
Indeterminate core-top	3	-	-	-	-	-	-	-	-	3	
Indeterminate rejuv debitage	2	-	-	-	-	-	-	-	-	2	
Lateral core rejuv	8	1	-	-	-	-	-	-	-	9	
Object from core rejuv	6	-	-	-	-	-	-	-	-	6	
Object from core rejuv debitage	4	-	-	-	-	-	-	-	-	4	
Pecked ground core-top	8	-	-	-	-	-	-	-	-	8	
Platform prep flake	206	9	-	-	-	-	-	-	-	215	
Striated core-top	21	-	-	-	-	-	-	-	-	21	
Blade-cores and fragments	524	9	0	0	0	0	0	0	0	533	30.1
Bidirectional core	10	2	-	-	-	-	-	-	-	12	
Bidirectional core fragment	10	-	-	-	-	-	-	-	-	10	
Blade-core frag (non-rejuv)	329	4	-	-	-	-	-	-	-	333	
Exhausted core	15	3	-	-	-	-	-	-	-	18	
Object from blade core frag	83	-	-	-	-	-	-	-	-	83	
Object from exhausted core	77	-	-	-	-	-	-	-	-	77	
Blades	379	79	0	0	7	5	0	1	0	471	26.6
Final series	339	74	-	-	7	5	-	1	-	426	
Initial series	40	5	-	-	-	-	-	-	-	45	

Table 4-2. Continued

Technology	El Chayal	Ixtepeque	La Union	Otumba	Pachuca	San Martin	Ucareo	unknown	Zacualtipan	Total	%
Misc. Blades and debitage	13	12	0	0	0	3	0	1	1	30	1.7
Blade artifact	-	2	-	-	-	-	-	-	-	2	
Chunk	-	-	-	-	-	1	-	1	-	2	
Edge modified flake	2	-	-	-	-	-	-	-	-	2	
Flake	4	4	-	-	-	1	-	-	-	9	
Flake (edge mod. Tool)	1	-	-	-	-	-	-	-	-	1	
Fragment	6	6	-	-	-	1	-	-	1	14	
Bifaces and points	3	2	0	3	3	0	1	0	0	12	0.7
Biface	1	-	-	1	-	-	-	-	-	2	
Point	2	2	-	2	3	-	1	-	-	10	
Other and adornments	0	13	1	0	0	0	0	0	0	14	0.8
(Undiagnostic) scraper	-	1	-	-	-	-	-	-	-	1	
Adornment (earflare, set)	-	12	-	-	-	-	-	-	-	12	
Obsidian pebble	-	-	1	-	-	-	-	-	-	1	
Total	1,595	147	1	3	10	8	1	2	1	1,768	
Percentage of Total	90%	8.20%	0.05%	0.16%	0.56%	0.62%	0.05%	0.16%	0.05%	100%	

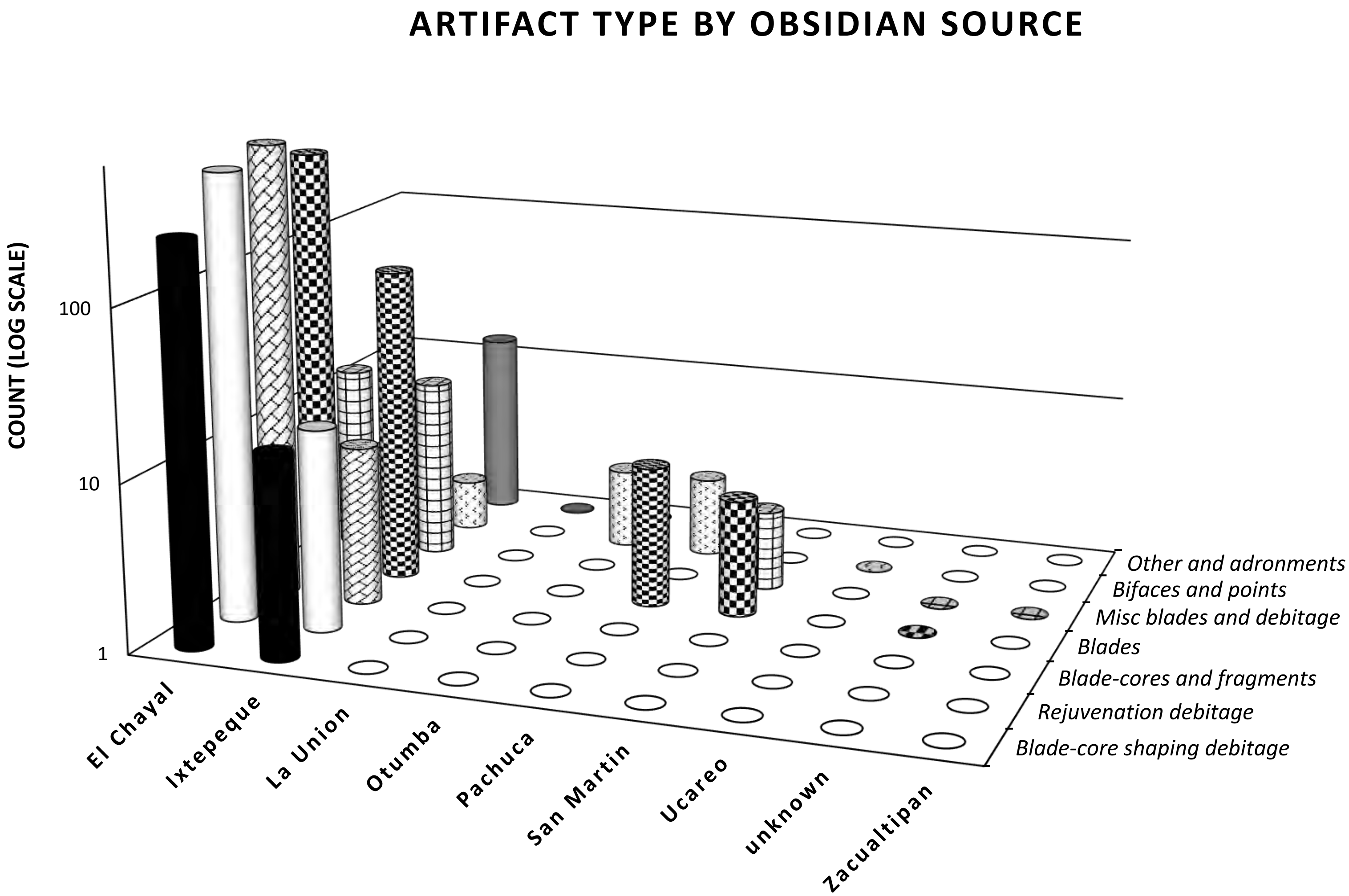


Figure 4-8. Artifact types by obsidian source. Bar graph in log scale (Base 10). Note that blade-core shaping debitage, rejuvenation debitage, and blade-cores and fragments are specific to only the El Chayal and Ixtepeque sources.

Percussion rejuvenation debitage (n=461) comprises 26 percent of the HHpXRF sample. A wide variety of rejuvenation debitage was assayed and included different technological sub-types (Table 4-2). The bulk of these sub-types are core-tops, platform preparation, and distal orientation flakes. These artifacts represent varied stages in the rejuvenation and preparation of a blade-core's platform and the realignment of the distal end of a blade-core (see Chapter 5). Like blade-core shaping debitage, El Chayal and Ixtepeque sources are represented in the sample, although Ixtepeque occurs in far lesser amounts. The presence of El Chayal in all sub-types of rejuvenation debitage is likely due to the abundant nature of this obsidian over all others. It also demonstrates the wide variety of techniques used to rejuvenate blade-cores from one source as opposed to another; however, it is entirely likely that all technological classes would occur if the XRF sourcing study were expanded to include more than 10 percent. Despite this sampling issue, these quantities from a 10 percent sample are consistent with other sourcing studies in the southern Maya lowlands (Ford et al. 1997; Moholy-Nagy et al. 2013; Nazaroff et al. 2010).

Blade-cores make up about 30 percent of the HHpXRF sample (n=533). The bulk of these artifacts are from the El Chayal obsidian source (n=524), while only 9 are from Ixtepeque. Like the previous two classes of artifacts, no other obsidian source is present in this technological classification. These artifacts are either exhausted blade-core, blade-core fragments, or objects from blade-cores (i.e., eccentrics). The vast majority of these artifacts are from El Chayal (n=524, or 98.3%), and therefore reinforcing the data already described above.

Obsidian blades that were scanned included both initial-series and final-series blades (see Chapter 5). Both of these blades could have been useful as cutting implements, but the vast majority of blades that exhibit use-related wear are final-series blades (see Chapter 5). These were also better represented in the Caracol assemblage and therefore more were assayed during the sourcing study. A total of 471 blades (initial-series blades n=45, final-series blades n=426) were assayed. The results show that the majority of blades are sourced to El Chayal and secondarily to Ixtepeque. Initial-series from both of these quarries further demonstrates that the local crafting or shaping of blade-cores from both El Chayal and Ixtepeque occurred. Other sources for final-series blades are present from Pachuca (n=7), San Martin de Jilotepeque (n=5) and an unknown source (n=1). The juxtaposition of these sourced blade with the complete absence of blade-core shaping debitage, rejuvenation debitage, and exhausted blade-cores, suggests that is very likely that these sources (e.g., Pachuca and San Martin) were being imported separately from other sources rather than locally produced.

Miscellaneous blade and other debitage (n=30 or 1.7%) reflect a similar pattern to that of blades. Both El Chayal and Ixtepeque are well represented and make up more than 80 percent of this artifact type. Three other sources make up the remainder of this type and are probably associated with the importation and local retouch of flake tools.

Of bifacial artifacts – bifaces and points – twelve were scanned and the results show that 7 or 58.3 percent come from sources other than El Chayal (n=3) and Ixtepeque (n=2). Three bifacial artifacts from Otumba, 3 from Pachuca, and 1 from Ucareo demonstrate that exchange networks for obsidian went far beyond the Guatemalan source areas. It is important to note that only three large green Pachuca obsidian Stem-B points were included in this study. A total of 6 were recovered from a cremation burial in the plaza of Caracol's Northeast Acropolis (A. Chase and D. Chase 2011; Johnson et al. 2010). These points were accompanied by the 18 green Pachuca blades not included in the HHpXRF study. A. Chase and D. Chase (2011) argue these and other artifacts establish a direct connection to individuals from central Mexico being active at Caracol during the Early Classic period and were used as tools to interact with the burning remains while later being interred with the individuals (Johnson 2010). A deposit with similar obsidian has been recorded at Altun Ha (Pendergast 1971, 2004; Spence 1996).

Other obsidian objects and adornments, like bifaces and points, make up less than one percent of the HHpXRF study. These include one scraper from an undiagnostic piece of debitage, a set of earflares (6 pieces each), and one obsidian pebble. Both the scraper and set of earflares are sourced to Ixtepeque and the single obsidian pebble is from La Union. The pieces comprising the earflares are from a single interment; they are retouched and ground so extensively that they cannot be confidently assigned to a technological type, but the tabular nature of these objects might suggest that they are blade-core tops or blade-core section flakes. These were attached to a ceramic backing with some type of adhesive (see Figure 5-32).

The single La Union obsidian pebble is similar to those objects described by Moholy-Nagy (2003a:51, Figure B 120a; see also Hildebrand Appendix H in Moholy-Nagy 2003). Moholy-Nagy (2003a) describes these similarly looking objects recovered from various excavations as tektites. Alan R Hildebrand (2003:100-101, Appendix H in Moholy-Nagy 2003) states, "These nodules [see Moholy-Nagy 2003a, Figure B 120a] were found in general excavations widely scattered through the city, mostly in small structure groups that are presumed to be residential. Unlike the single small rounded pebble or nodule from Caracol, Tikal's small assemblage of eleven were not recovered form ritual contexts. Also dissimilar to Caracol, the small pebbles are not obsidian, but rather tektites. Hildebrand (Appendix H in Moholy-Nagy 2003a:100) states, "Tektites are natural glasses quenched from superheated melts, produced and ejected at relatively large velocities, by [meteor] impacts on the surface of the earth." Their overall general appearance and size is similar to the single pebble recovered from Caracol, but their color and geochemistry are significantly different (see Koeberl and Sigurdsson 1992; Hildebrand et al. 1992 cited in Moholy-Nagy 2003a). No elemental concentrations were provided in Moholy-Nagy Appendix H (2003a:100-101) and no response from received from the laboratory that conducted elemental analysis in time for further discussion in this research.

A technological differentiation of artifacts by obsidian source demonstrates that there is a fairly clear difference between raw material form, local reduction, and tool type as it pertains to sources. Both El Chayal and Ixtepeque provided the bulk of tool stone for the production of blades and it appears that at least El Chayal obsidian was imported in the form of roughed-out macrocores that still retained minor traces cortex. Ixtepeque may have been imported in a similar form albeit in far fewer amounts, and did not retain any cortical material. The other forms- those of bifaces, points, adornments, or other objects - appear to be more aligned with sources apart from El Chayal and Ixtepeque. These data enable a broader discussion of other regional trade that included finished or unmodified objects imported from Mexican as well as Honduran obsidian sources.

Spatial and Chronological Considerations in Obsidian Sourcing

Both Braswell (2010:132, Table 6.1) and Hirth (1998) explain that the existence of marketplace exchange will result in a 'homogeneity' in the distribution of obsidian commodities and obsidian sources at a given site. Although marketplace exchange has been argued to exist at Caracol (D. Chase and A. Chase 2014a), the degree to which markets influenced the distribution of obsidian and how there may be differential access with regard to residential status remains untested using statistical methods (see Chapter 6). Nevertheless, obsidian source data from Caracol does introduce a first line of evidence to argue that obsidian was moving through a local marketplace system.

A benefit of this research was that each artifact could be mapped to its approximate location within Caracol, thus enabling a distributional analysis using multiple datasets. This type of distributional analysis allows for an actual visualization of what *homogeneity* may look like in terms of obsidian source distribution. A distributional analysis is also performed on different technological classes as well (see Chapter 6) to better frame further discussions regarding the nature of local exchange. Despite the caveats in Chapter 4 regarding previously excavated collections, there is sufficient data from the existing obsidian database to draw a series of conclusions. It is also extremely likely that if systematic testing across Caracol's some 200sqkm of settlement would continue to occur, the data gathered would reinforce many of the conclusions presented in earlier research that asserted a well-integrated local economy where households throughout the city relied on market exchange (A. Chase and D. Chase 2009; D. Chase and A. Chase 2014a).

El Chayal obsidian was the most accessible source of obsidian at Caracol and therefore was the most abundant source for blade-tool production. If markets were a mechanism for this source to move about within Caracol, then we should expect to see a dispersed, non-clustered distribution. Figure 4-9 shows the distribution of El Chayal obsidian throughout the site. The distributional pattern does not support the supposition that source distribution was restricted to certain areas or status groups. Similarly, the distribution of Ixtepeque obsidian is also widely distributed (Figure 4-10).

However, other sources apart from these two Guatemalan sources (and the single La Union pebble) do appear to cluster and are limited to the city center and areas just adjacent to it (Figure 4-11). It could be likely that these items were only accessible through a marketplace located in the city center and therefore did not disperse far beyond. D. Chase and A. Chase (2014a:243, Figure 4) show that a marketplace located within the city center had a projected 3km service area and therefore these finished artifacts were readily available to those closest to this market. It is also likely these *foreign* objects were traded directly with local elites living in epicentral palaces and therefore may have not circulated through markets. These sources (e.g., Otumba, Pachuca, San Martin de Jilotepeque, Ucareo, Zacualtipan, and an unknown source) also correspond to the transition between Early Classic 1 and Early Classic 2 period (AD 330) (see Figure 4-12). The presence of a Teotihuacan style burial in Caracol's Northeastern Acropolis suggests that people with ties to central Mexico were present at Caracol during this time and may have brought trade items with them from outside the Maya lowland areas (Pendergast 1971, 2004; Spence 1996). This time period also corresponds to marked decrease in El Chayal obsidian and a slight increase in Ixtepeque (see Figure 4-13) and therefore this may provide evidence for some general changes in trade relations that eventually reverted to an earlier trajectory.

Artifacts from these sources entered Caracol as blades and bifacial tool forms, some of which were exclusively used in city center rituals. This will be discussed further below, but it is important to note that there are three lines of evidence – technological, source geochemistry, distribution, and temporal – to suggest that the transition between Early Classic 1 and Early Classic 2 constitutes a unique time of change and influence with regard to obsidian importation.

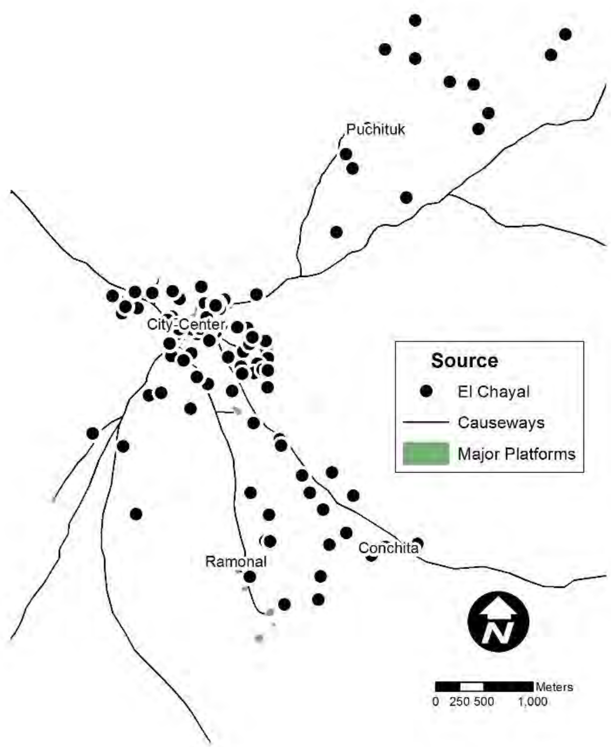


Figure 4-9. Spatial distributions of El Chayal obsidian at Caracol. Note the wide distribution of sources from the sampled residential settlement.

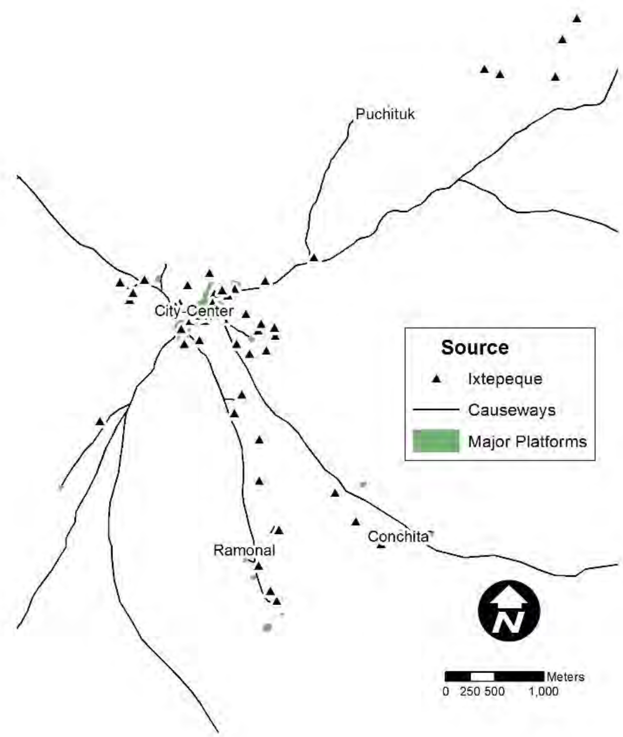


Figure 4-10. Spatial distributions of Ixtepeque obsidian at Caracol. Note that although less dense overall, the distribution is still wide spread from the sampled residential settlement.

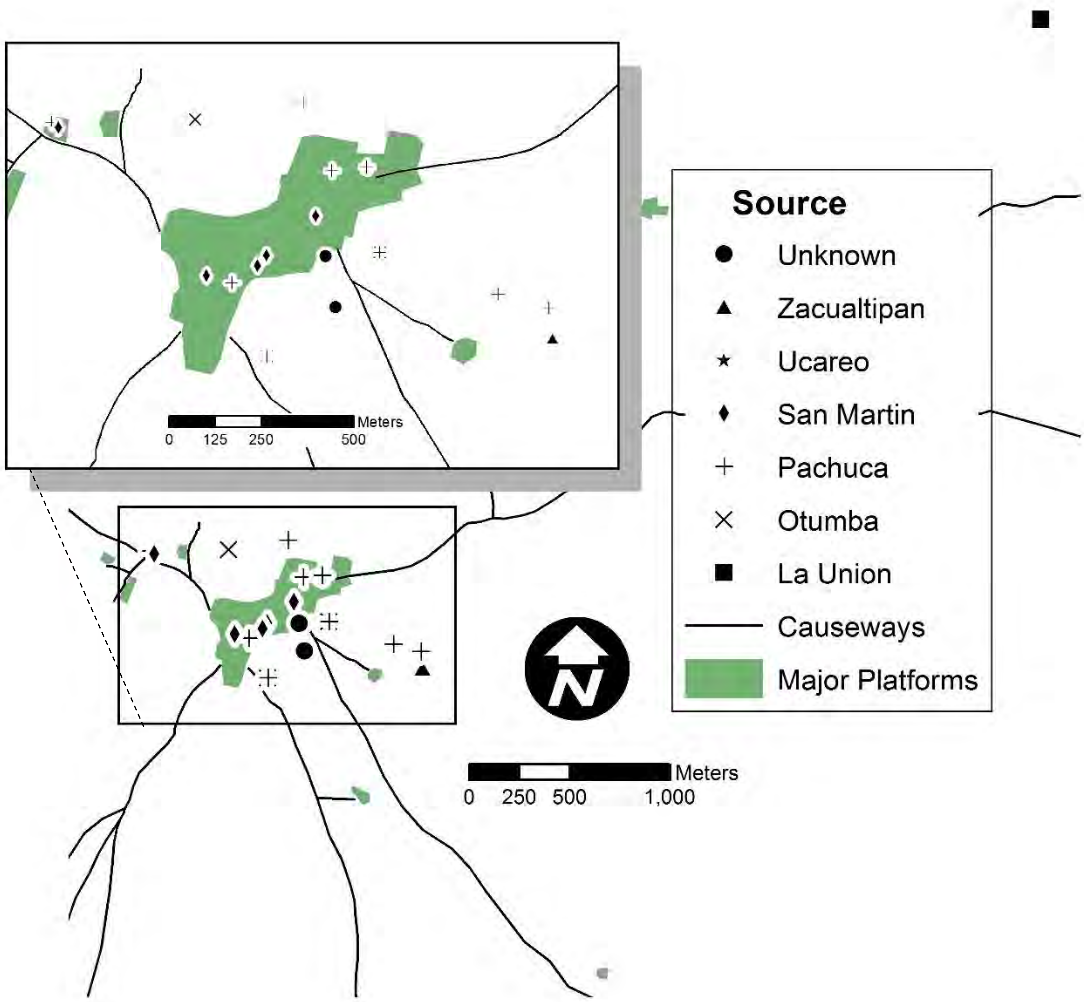


Figure 4-11. Spatial distributions of other obsidian sources at Caracol. Note that sources other than El Chayal and Ixtepeque (with the exception of a single La Union artifact) are limited to elite complexes in and just outside the city center.

As the previous sections have shown, the bulk of obsidian coming into Caracol was from the El Chayal obsidian source (90.2%) and the second most abundant source was that of Ixtepeque (8.3%). Other sources combined make up approximately 1.5 percent of the total assemblage. This next section will address how might the importation of these sources changed or stayed consistent through time. Table 4-3 and Table 4-4 show the time periods represented at Caracol and obsidian distribution by source. These time periods are derived from dating primary contexts and ceramics assemblages (e.g., A. Chase 1994; A. Chase and D. Chase personal communication 2012). Many Maya sites in the region also have obsidian assemblages that date to these broad time periods; however, their bracketed limits can be slightly different than those presented here, therefore further comparison must take this into account. For example, Moholy-Nagy et al. (2013:89, Table 6) defines multiple time periods which makes specific temporal comparisons difficult, while others more or less align with Caracol (see Kosakowsky 2012:44, Table 3.1). Because the Classic period can be defined broadly and are commonly done by lead researchers, I use the local Caracol chronology with comparisons to other sites nearby that likely obtained obsidian alongside Caracol for more than 500 years. I begin my data with a slightly different order. I display my data from the earliest dated obsidian artifact through to the most recent data. These dates and counts by time period are listed in Table 4-3.

Table 4-3. Number of Caracol obsidian artifacts sampled by time period for all available obsidian sources.

Period	Dates	Cerro Varal	El Chayal	Fuentezuelas	Ixtepeque	La Union	Otumba	Pachuca	Paredon	San Martin	Tulancingo	Ucareo	unknown	Zacualtipan	Zaragoza	Grand Total
Late Preclassic 1	ca 300 BC - 50 BC		1		2											3
Late Preclassic 2	50 BC - AD 200		7		3	1										11
Early Classic 1	AD 200 - 350		15		4			3								22
Early Classic 2	350 - 550		49		29					2		1	1			82
Late Classic 1	550 – 700		308		35		1	2		1			1			348
Late Classic 2	700 - 800		1,147		62		2	5		4				1		1,221
Terminal Classic	800 - 900		68		12					1						81
Grand Total		0	1,595	0	147	1	3	10	0	8	0	1	2	1	0	1,768

Table 4-4. Percentage by time periods and obsidian sources present at Caracol. Number sampled is in parenthesis after time period.

Period (n=)	El Chayal	Ixtepeque	La Union	Otumba	Pachuca	San Martin	Ucareo	unknown	Zacualtipan
Late Preclassic 1 (3)	33.3	66.7							
Late Preclassic 2 (11)	63.6	27.3	9.1						
Early Classic 1 (22)	68.2	18.2			13.6				
Early Classic 2 (82)	59.8	35.4				2.4	1.2	1.2	
Late Classic 1 (348)	88.5	10.1		0.3	0.6	0.3		0.3	
Late Classic 2 (1,221)	93.9	5.1		0.2	0.4	0.3			0.1
Terminal Classic (81)	84.0	14.8				1.2			
Percentage of total	90.2	8.3	<0.1	0.2	0.6	0.5	<0.1	0.1	<0.1

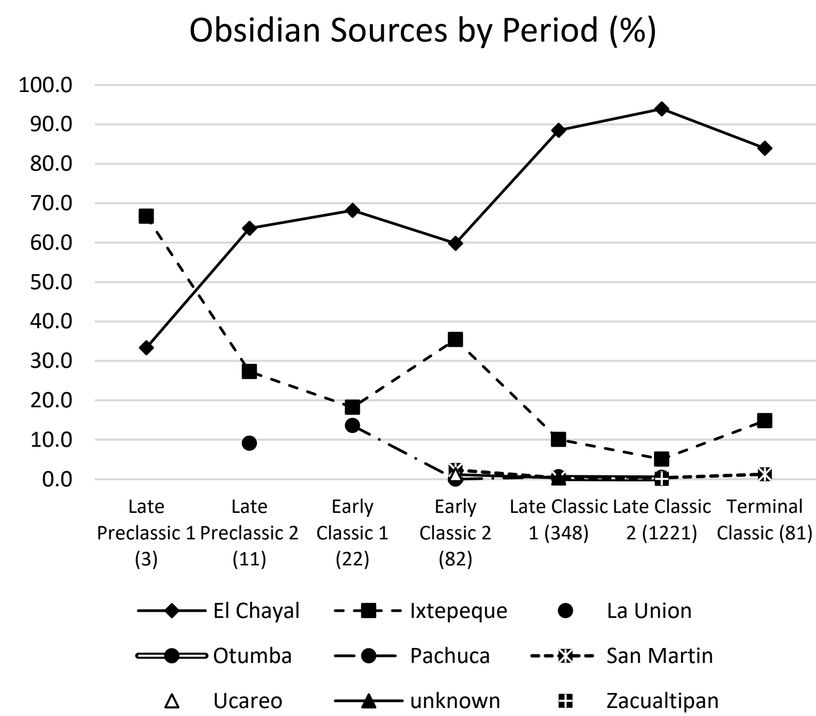


Figure 4-12. Distribution of obsidian sources through time at Caracol, Belize. The number in parentheses is total number of artifacts scanned using a HHpXRF. Figure modeled after Meierhoff et al. (2012:278, Figure 14.1).

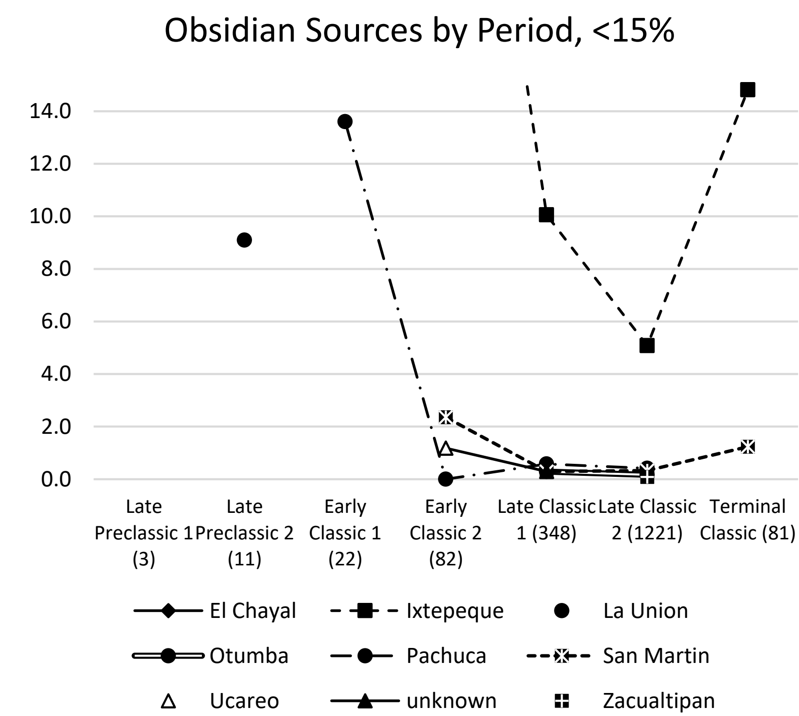


Figure 4-13. Distribution of obsidian sources through time at Caracol, Belize. Graphic shows sources that make up <15% of total by time period (La Union, Otumba, Pachuca, San Martin, Ucareo, Zacualtipan, and Unknown).

The general temporal trends observed at Caracol are similar to other studies in Belize and the Petén area (Cecil et al. 2007; Dreiss and Brown 1989; Meierhoff 2012; Moholy-Nagy 1999; Moholy-Nagy et al. 2013) and technological type by time period demonstrates that crafting obsidian blades was practiced locally throughout Caracol's history beginning in the Late Preclassic (see Table 4-5). A few observations are notably different when compared to other studies. Particularly some of these differences may be due to alternative sampling strategies across different projects in the Maya lowlands. The Late Preclassic 1 period (ca 300-50 BC) represents a time that yielded the least amount of datable obsidian. Only three obsidian artifacts can be dated to this time period. But these data begin the long-term trend that is seen throughout the Classic period – both El Chayal and Ixtepeque dominate the overall assemblage through time. These trends are evident from other studies but the overall percentages reported from different sources may vary. Again, this is likely due to sample differences.

During the Late Preclassic 2 (50 BC-AD 200), there is a notable increase in the presence of El Chayal obsidian and a marked decrease in Ixtepeque obsidian. This change in percentages by source during this time period marks the beginning of a general trend toward greater El Chayal importation except with some interruption during the Early Classic 2 period. Also present during the Late Preclassic 2 is the presence of a single obsidian sample from La Union. This artifact described above and further in Chapter 6 was recovered from a cache (S.D.C118F-6) located in the eastern ritual shrine structure at the Monterey Group. This cache consisted of a larger "lion's paw" shell and four "Charlie Chaplin" figures (see Lomitola 2012:133, Figure 66). The presence in this obsidian source in this cache deposit may signify some early connection with the Copan Valley and some obsidian sources nearby.

The Early Classic 1 period (AD 200-350) shows a growing trend to the increasing importation of El Chayal and further decrease in Ixtepeque; however, this trend reverts to an earlier pattern during the Early Classic 2 (AD 350-550) where Ixtepeque makes about one third of the total obsidian sources. This ratio is reflected earlier during the Late Preclassic 2. Also during the transition from Early Classic 1 and Early Classic 2, there is an introduction of Mexican sources of obsidian. As stated above this might be due to some new populations moving in or a broader trade network influencing the region; it may likely be both of these scenarios. Regional relationships were certainly growing during beginnings of the Classic period around AD 200-550. Moholy-Nagy et al (2013:89, Table 6) show that obsidian from Mexican sources first appears during the transition from Tikal's Terminal Preclassic (A.D 150-250) into that site's Early Classic (A.D. 250-500). A Mexican population, or individuals identifying with central Mexico, did make a presence at Caracol during this time (A. Chase and D. Chase 2011). The same types of obsidian sources first appear at Caracol during this period as well (Table 4-3, Figure 4-12). While some green obsidian was recovered from domestic refuse and/or construction fills in the form of utilized medial blade fragments (n= approximately 34), nearly half of green obsidian (n=32 or 48%) was recovered from an elaborate cremation burial from within the plaza of Caracol's Northeast Acropolis (A. Chase and D. Chase 2011). The presence of these objects and others demonstrates that individuals from, or in relation to a people identifying with Teotihuacan were present at Caracol and were aligned with elites living in the city center. The distribution of geochemically sourced Mexican obsidian also supports a limited distribution outside Caracol's city center elite.

This may due to direct exchange with foreign merchants or that these objects entered directly into a city center market and therefore circulated within a given provisioning radius (see D. Chase and A. Chase 2014b). Braswell (2010:136) and Aoyoma (1999) both claim that green obsidian was traded directly with Copan's elites and was not redistributed to lesser status groups. At Caracol, however, some green obsidian blades were consumed outside Caracol's elite center and therefore further research is needed. A cursory examination of the remaining 34 artifacts does not demonstrate that *all* green obsidian was restricted to the site's epicenter like the cremation burial. Rather, it looks like some green obsidian was accessible to the wider population and the burial context may have been the exception.

During the Late Classic 1 period (AD 550-700) a drastic shift in obsidian importation is apparent. Not only does there appear to be greater access overall, but El Chayal again dominates the sampled assemblage. A preliminary assessment of technological types by time period suggests that the Late Classic 1 period shows the first time that core-shaping debitage with cortex is present. The presence of this debitage during the noted increase in importation suggests that this period is when Caracol began having access to roughed-out macrocores rather than prepared pressure cores. Although preliminary, these types of debitage are also reflected in the Late Classic 2 period (AD 700-800) through Terminal Classic (AD 800-900) deposits, signaling a continued trend until the site was abandoned.

The Late Classic 2 period (AD 700-800) exhibits nearly 95 percent reliance on El Chayal obsidian. Most Mexican obsidian sources are also present during this time period with the exception of Ucareo and an unknown source. The majority of obsidian assayed for geochemical data dating to this time period was from two above-tomb deposits located in the city center. Both Operations C12 (Structure A3) dating to ca. AD 695 and C87 (Structure A34) dating to ca. AD 682 (see A. Chase and D. Chase 1987:13-15, D. Chase and A. Chase 1996; D. Chase personal communication 2014), yielded two of the largest deposits of obsidian yet recovered from Caracol's architectural ritual deposits. These and two other similar deposits are discussed later in Chapter 7, but it is important to note here that the transition between Late Classic 1 and Late Classic 2 period is marked by the occurrence of these deposits not only at Caracol, but also at other sites (see Moholy-Nagy 1997:306). A geochemical sourcing study of these contexts may distort overall consumption patterns. Because Operation C19 (Structure L3), like C12 and C87, also yielded a larger obsidian deposit associated with a tomb style burial and may reflect an organized and well managed effort on the part of obsidian crafter to curation production debitage, it may be possible that these deposits were made up from obsidian that likely predate the tombs by serval years or perhaps decades. Crafters may have had to wait sometime for the backlog of production waste to build up before it could be moved to these singular ritual events surrounding the death of these elite individuals. As will be discussed (see Chapter 6), these deposits may introduce problems into an obsidian sourcing study, but it is important to note that the debitage reflected in the HHpXRF sample is representative of the activities occurring during the Late Classic 1 to Late Classic 2 periods. The general trend is still clear despite potential sampling errors – El Chayal continues to dominate Caracol's obsidian supply while the other Guatemalan sources make up less than 10 percent of the total for the Late Classic 2 period.

Obsidian counts for the Terminal Classic period are not what they were for the Late Classic periods and are only slightly higher than the Early Classic 2 period. While overall counts appear to tapper-off after the Late Classic 2 period into the Terminal Classic, the kinds of overall sources being acquired by Caracol does not drastically change, with the exception of obsidian from Mexican sources. These data continue to support a wide range of networks still in place before the site was abandoned sometime around A.D. 900 (A. Chase and D. Chase 2007b:23). All Guatemala obsidian sources are present, but in fewer sampled amounts, and there is an absence of Mexican obsidian during this era. This may reflect a general trend in the waning of Caracol's regional demand for Guatemalan obsidian, the transition away from trading, a lack of access to Mexican obsidian objects, and/or a product of sampling bias.

Observations and Interpretations from Sourcing Obsidian

Technological Classification

A number of broad observations are apparent from an analysis of the technological types by obsidian source. First, El Chayal obsidian was used to manufacture the widest range of obsidian objects. Ixtepeque too was used much the same way as El Chayal, although with less overall percentages. Second, other sources were nearly exclusively reserved to specific artifact forms (e.g., many finished blades – manufactured elsewhere – and bifaces and points) and these were most likely imported rather than locally manufactured. These observations therefore suggest that Caracol was more closely aligned with sites in the Petén region and those in both southern and northern Belize during the Classic period.

Spatial Distribution

Spatial mapping of artifacts by obsidian source has shown that both El Chayal and Ixtepeque were widely distributed during the Classic period broadly and especially during AD 550 – 800. Other sources, however, are more restricted to Caracol's city center. Interestingly, these other sources (i.e., those excluding El Chayal, Ixtepeque, and La Union) first appear by the Early Classic 2 period (AD 350 – 550) and, with the exception of San Martin, tapper off quickly through the next few hundred years.

The single La Union obsidian pebble from a cache within the eastern structure at the Monterey group is clearly an outlier when compared to the other data. This piece also demonstrates that some of Caracol's earliest established residences that were not located within the city center had connections to exchange partners that brought materials from the southeast into Caracol. Lomitola (2012) describes the Monterey group:

> The Monterey Group is outside of the epicenter and may have been an early "node" location. While it is similar in architectural layout and size to many of Caracol's elite residential groups, the nature of the caches found within the eastern structure are similar to many of the Early Classic [Late Preclassic] caches found in the public structures of Caracol, Hatzcap Ceel, and Cahal Pichik, all exterior to and at least 3 km from the group. Monterey and the surrounding area may have been attempting to establish itself as a distinct political unit during the Late Preclassic [Late Preclassic] Period, a contemporary to both Hatzcap Ceel and Cahal Pichik directly to the east (A. Chase Personal Comm. 2011). A ballcourt located in close proximity to the Monterey Group may serve as evidence for an early political entity. However, Monterey and the surrounding area were all consumed by Caracol's Late Classic polity.

The sample size for earlier time periods is not as well represented as later time periods and therefore spatially mapping these samples would not enable a broader discussion of obsidian exchange. The later time periods, however, do exhibit a marked pattern (Figure 4-9, Figure 4-10, and Figure 4-11). As stated above, both El Chayal and

Ixtepeque do exhibit a broad distribution and therefore it is likely that local markets were present beginning as early as the Early Classic 2 period (AD. 350 – 550). Further studies of earlier material are required to better understand when markets were influencing obsidian distributions, that is assuming they existed prior to the Early Classic 2 period.

Other non-market transactions may have occurred between merchants and those high status individuals living in or near to the city center. As Figure 4-11 has already shown, sources such as Otumba, Pachuca, Ucareo, and others are limited to the city center and do not circulate beyond the 3 km provisioning radius modeled for this location (D. Chase and A. Chase 2014a:243, Figure 4). One of two scenarios is likely. Either (1) this city center market was the only market to receive these objects and therefore they did not circulate to other areas or (2) these objects were exchanged directly with those individuals living in or near to the city center. The second scenario may allow for a cursory examination of elite gift-giving between non-Caracol merchants or other elites and local Caracol elites. Further analysis is required to better engage non-market exchange options during the Classic period as it pertains to obsidian research.

Temporal Changes

One issue that has not been discussed in the above presentation is that obsidian sources were not mapped with respect to time period because greater sampling and temporal resolution is needed. This is an important dimension for understanding when in time sources become widely distributed and accessible to the population. Further research is needed to better understand when local markets may have impacted the internal distribution of obsidian even though D. Chase and A. Chase (2014a) argue that markets were influencing distributions during most of the Classic period (AD 250-900). During the time periods that are represented in the obsidian sourcing study, both El Chayal and Ixtepeque obsidian increase in amount and it is therefore likely that with the increase in source acquisition there was a greater dispersal of obsidian to the local population. Despite spatially mapping obsidian source data by time period, the bulk of obsidian assayed during the source study indicate that 1,569, or 88.7% date to the Late Classic period broadly; therefore, if mapped, a wide distribution would likely indicate that markets were certainly influencing the distribution of obsidian beginning as early as AD 550.

A second observation is evident from reviewing data presented in Table 4-5. Table 4-5 shows artifact type by time period and by source. The Late Preclassic is the earliest known date in the assayed material. The typology of the three artifacts shows that obsidian blade-production did occur on obsidian from both the El Chayal and Ixtepeque sources. The later Late Preclassic shows the same kind of data, but with the absence of Ixtepeque cores – probably due to sampling – and during this time period we begin to see that El Chayal obsidian was likely arriving in the form of already reduced macrocores where macro-debitage was removed to further prepare pressure blade-cores.

The Early Classic 1 period is when evidence of objects made from exhausted blade-cores first appears. These typically are called eccentrics will be discussed later in Chapters 6 and 8. Beginning in the Early Classic 2 period both El Chayal and Ixtepeque began arriving as macrocores that are further reduced – producing macro-debitage and other percussion debitage – to form pressure blade-cores. The Late Classic periods (1 and 2) show similar data in terms of the available raw materials and the continued trend to import raw materials that need initial shaping before primary pressure blade-cores were formed. The second half of the Late Classic exhibits the greatest amounts of various types of artifacts.

The importation of obsidian persisted into the Terminal Classic period although the percentage diminished drastically. Despite being caused by sampling the collection, both El Chayal and Ixtepeque still arrived in similar forms (e.g., reduced macrocores) as indicated by the presence of macro and other percussion debitage. Blade production on these sources of obsidian persisted up until the time of the site's abandonment where as it appears that no other sources are present except for a single final-series blade from San Martin.

Table 4-5. Sampled technological classification of obsidian artifacts by time period and obsidian source.

Time period / tech. class	El Chayal	Ixtepeque	La Union	Otumba	Pachuca	San Martin	Ucareo	Unknown	Zacualtipan	Totals
Late Preclassic 1	1	2	0	0	0	0	0	0	0	3
Blade-core	-	1	-	-	-	-	-	-	-	1
Final-series blade	1	1	-	-	-	-	-	-	-	2
Late Preclassic 2	7	3	1	0	0	0	0	0	0	11
Blade-core	1	-	-	-	-	-	-	-	-	1
Final-series blade	4	3	-	-	-	-	-	-	-	7
Initial-series blade	1	-	-	-	-	-	-	-	-	1
Macro debitage	1	-	-	-	-	-	-	-	-	1
Pebble	-	-	1	-	-	-	-	-	-	1
Early Classic 1	15	4	0	0	3	0	0	0	0	21
Blade-core	7	1	-	-	-	-	-	-	-	8
Core rejuv. debitage	2	-	-	-	-	-	-	-	-	2
Final-series blade	4	1	-	-	1	-	-	-	-	6
Initial-series blade	1	-	-	-	-	-	-	-	-	1
Macro debitage	1	-	-	-	-	-	-	-	-	1
Point	-	-	-	-	2	-	-	-	-	2
Undiagnostic	-	2	-	-	-	-	-	-	-	2
Early Classic 2	49	29	0	0	0	2	1	1	0	82
Adornment	-	12	-	-	-	-	-	-	-	12
Biface	1	-	-	-	-	-	-	-	-	1
Blade-core	12	1	-	-	-	-	-	-	-	13
Core rejuv. debitage	4	-	-	-	-	-	-	-	-	4
Final-series blade	28	11	-	-	-	-	-	-	-	39
Initial-series blade	2	2	-	-	-	-	-	-	-	4
Macro debitage	1	2	-	-	-	-	-	-	-	3
Point	-	1	-	-	-	-	1	-	-	2
Small perc. debitage	1	-	-	-	-	-	-	-	-	1
Undiagnostic	-	-	-	-	-	2	-	1	-	3
Late Classic 1	308	35	0	1	2	1	0	1	0	348
Biface	-	-	-	1	-	-	-	-	-	1
Blade-core	144	1	-	-	-	-	-	-	-	145
Core rejuv. debitage	30	5	-	-	-	-	-	-	-	35
Final-series blade	107	18	-	-	2	1	-	1	-	129
Initial-series blade	7	2	-	-	-	-	-	-	-	9
Macro debitage	15	5	-	-	-	-	-	-	-	20
Small perc. debitage	2	-	-	-	-	-	-	-	-	2
Undiagnostic	3	4	-	-	-	-	-	-	-	7
Late Classic 2	1,147	62	0	2	5	4	0	0	1	1,221
Blade-core	349	4	-	-	-	-	-	-	-	353
Core rejuv. debitage	400	11	-	-	-	-	-	-	-	411
Final-series blade	165	32	-	-	4	3	-	-	-	204
Initial-series blade	26	1	-	-	-	-	-	-	-	27
Macro debitage	64	3	-	-	-	-	-	-	-	67
Point	2	1	-	2	1	-	-	-	-	6
Small perc. debitage	132	4	-	-	-	-	-	-	-	136
Undiagnostic	9	6	-	-	-	1	-	-	1	17
Terminal Classic	68	12	0	0	0	1	0	0	0	81
Blade-core	11	1	-	-	-	-	-	-	-	12
Core rejuv. debitage	9	-	-	-	-	-	-	-	-	9
Final-series blade	30	8	-	-	-	1	-	-	-	39
Initial-series blade	3	-	-	-	-	-	-	-	-	3
Macro debitage	10	1	-	-	-	-	-	-	-	11
Small perc. debitage	4	1	-	-	-	-	-	-	-	5
Undiagnostic	1	1	-	-	-	-	-	-	-	2
Grand Total	1,595	147	1	3	10	8	1	2	1	1,768

Summary and Further Regional Considerations

This chapter presented the results of a handheld portable energy dispersed X-Ray florescence study of 1,768 obsidian artifacts from Caracol, Belize. Chapter 4 began the analysis of movement of obsidian from quarries far from the site. It explored how and in what forms obsidian was moved or transported, and discussed temporal changes within a broad regional exchange network. Through this elemental analysis, the initial movements of obsidian from various quarries first began early in Caracol's history and increased in amount and complexity over time. These general trends regarding the increasing complexity and amount of obsidian movement into Caracol would certainly be better understood if an increased sample size was considered. In addition, for the first time data are available that situate Caracol among other studies and demonstrates that Caracol, like other established centers, was a major consumer and may have influenced overall access to obsidian by other sites. We are also now in a better position to redraw linkages and relationships between Caracol and obsidian quarries as well as those sites in between and far beyond (Figure 4-14). Specifically, what was Caracol's relationship to sites to the south and north of it borders? Did sites northward have their obsidian funneled through Caracol? Did sites to the south of Caracol influence what was available locally? It is anticipated that these linkages to other sites will be explored in the near future.

Figure 4-14. Regional trade map. Modified after Nazaroff et al. (2010:889, Figure 3) and Demarest et al. (2014:188, Figure 1). Note the inclusion of La Union and routes from El Chayal and Ixtepeque through southern Belize.

CHAPTER 5
THE ORGANIZATION OF CRAFTING AND PRELIMENARY DEPOSITIONAL ANALYSIS

Overview and Social Significance

The goals of Chapter 5 are to (1) describe the organization of blade production at Caracol broadly through presenting the obsidian artifacts and the methods of artifact analysis, (2) introduce descriptions and discussions of obsidian artifacts by archaeological context, and (3) relate obsidian blade production at Caracol to other studies in the Maya area and broadly in Mesoamerica. In terms of the itinerary approach, this chapter follows Chapter 5 where the reduction sequence outlined below occurred after obsidian arrived at Caracol. The vast majority of the artifacts that are included in this description of obsidian craft production come from both the El Chayal and Ixtepeque obsidian sources. As mentioned in Chapter 3, there is no evidence to suggest that Mexican obsidian was being reduced locally. This chapter's content is like other Mesoamerican studies of blade production in that it does use a linear sequence broadly (Figure 5-1, Figure 5-2, Figure 5-3, Figure 6-4, Figure 5-5, Figure 5-6; Hirth and Andrews 2002:3-4, Figures 1.1 and 1.2). But it is important that the background of this study be explained in order to see how this research is similar to other studies, but diverges from them. Creating similarities and distinguishing the differences within the research is done for explicit reasons. In terms of similarities to other studies, I recognize a combination of techniques (1) *percussion*, (2) *pressure*, and (3) *percussion rejuvenation*, as well as different types of objects: (4) *blade-cores and blade-core fragments* and (5) *non-blade-core objects* (e.g., bifaces, projectile points, adornments – these did not include those objects that were made from recycled blades or related debitage), and (6) *undiagnostics* – those artifacts that cannot be easily assigned to the first five categories. These six categories are organized to record the initial stages of core shaping from obsidian macrocores through undiagnostic artifacts, like shatter and flake fragments, via different reduction strategies. It is important to note here that while sorting and analyzing the collection, analysis fields were added and the analysis scheme was modified when necessary.

Nodules

↓

Percussion Technique (Figure 5-2):

Core Preform

> Core Shaping Debitage > [Exchange*] > Mod/Use/Reuse** > Movement***> **Burial, Cache, Use/Refuse**

↓

Primary Macrocore

> Macro-debitage > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**

↓

Secondary Macrocore

> "Small" Percussion Debitage > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**

↓

Pressure Technique (Figure 5-3):

Polyhedral Core

> Initial-Series (*1's*) Blades > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**

↓

Secondary Polyhedral Core

> Initial-Series (*2's*) Blades > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**
> Platform Preparation > Cortical – Grinding – Striating – Pecking – Other

↓

First Pressure Core

> Final-Series (*3's*) Blades > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**

↓

Percussion Rejuvenation Technique (Figure 5-4):

Core Rejuvenation Process

> Core-Top/Sections/Distal/Lateral > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**
> Platform Preparation > Cortical – Grinding – Striating – Pecking – Other

↓

Pressure Technique (Figure 5-4 and Figure 5-5):

Second Pressure Core

> *3's* (possibly shorter blades) > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**
> Bidirectional Technique
Errors> Overshots > [Exchange] > Mod/Use/Reuse > Movement > **Burial, Cache, Use/Refuse**

↓

Exhausted Core

↓

Percussion and/or Pressure Technique (Figure 5-6):

[Exchange] > Mod/Use of Exhausted Core > Core Destruction**** (Termination) > Sectioning [proximal platform removal, medial, distal removal, lateral (notching), Other] > Movement of Fragments > **Burial, Cache, Use/Refuse**

↓

Modified Exhausted Core > [Exchange] > Use > Movement > **Burial, Cache, Use/Refuse**

---

* Exchange may occur before or after modification/use; ** Abbreviation for Modification/Use; *** Refers to macro market exchange, micro interpersonal exchange, and/or movement into a burial, cache, or refuse/fill context; **** This refers to technological and social process of transforming an exhausted core into another kind of object, designed for another purpose

Figure 5-1. A Model for Obsidian Reduction, Movement, and Use within Caracol, Belize. Note that objects produced during the reduction stages may enter various contexts and therefore reflects management of debris at primary workshops.

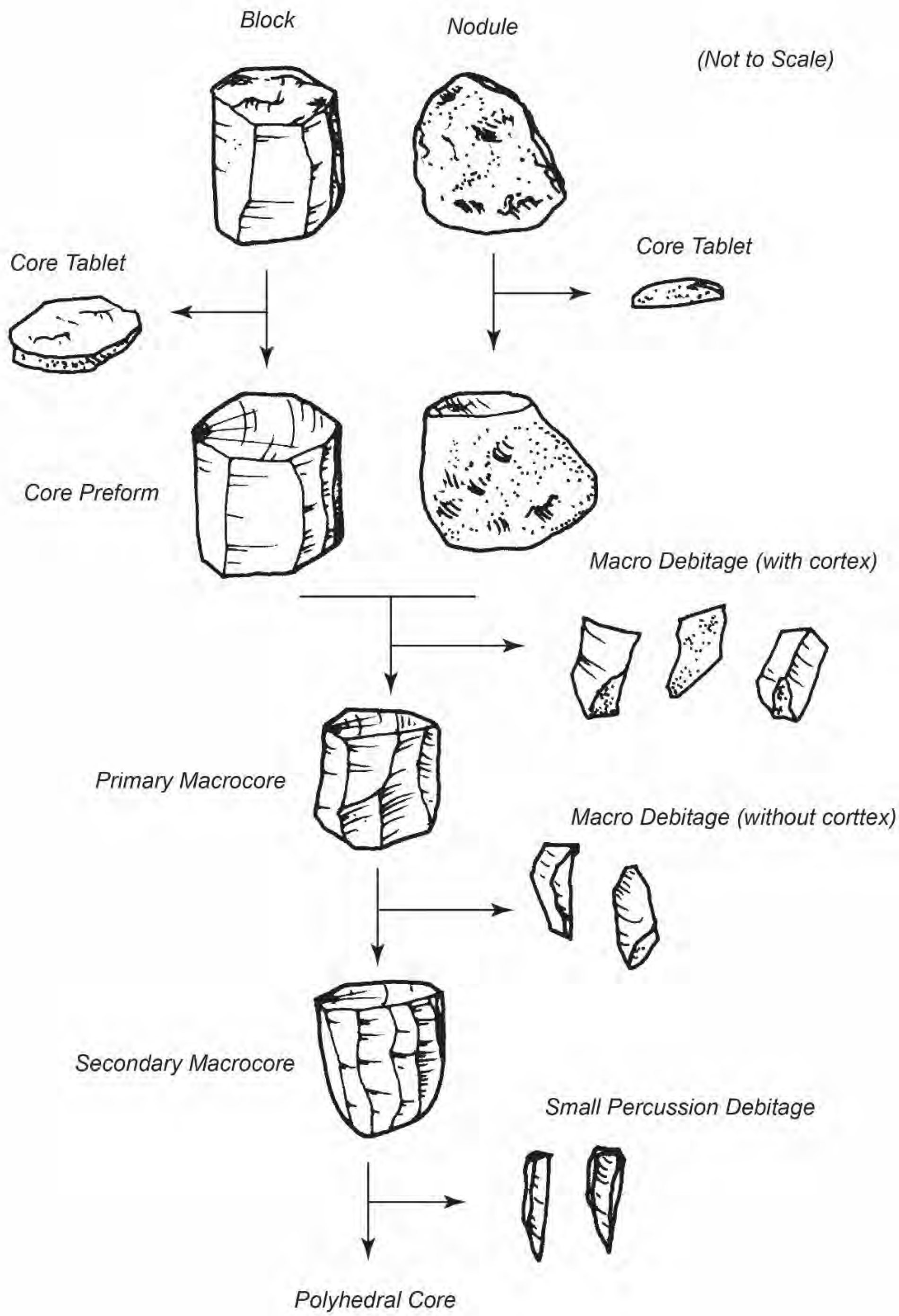


Figure 5-2. Idealized percussion reduction technique. Adapted from Hirth and Andrews 2004:3-4, Figures 1.1 and 1.2.

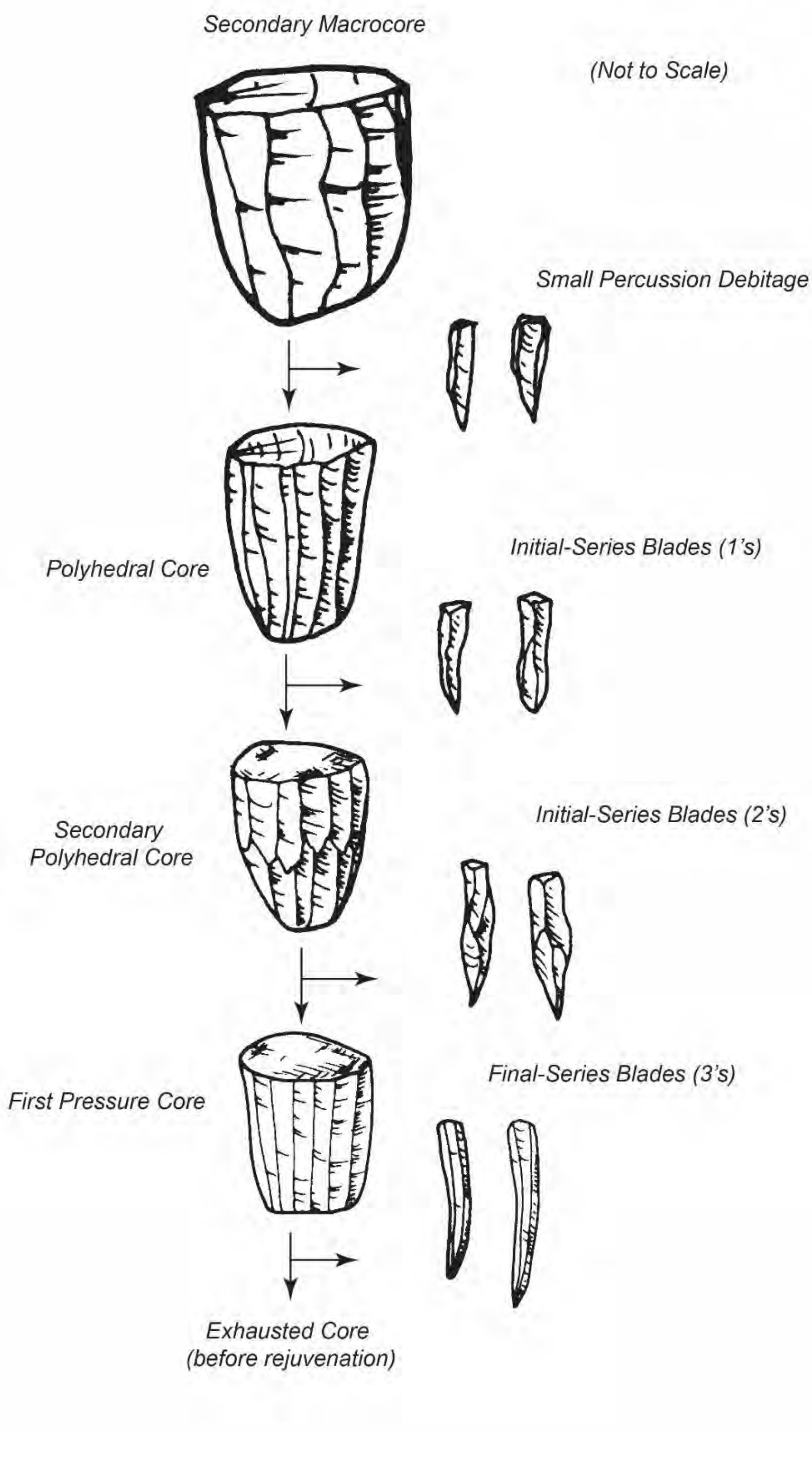


Figure 5-3. Idealized pressure reduction technique. Adapted from Hirth and Andrews 2004:3-4, Figures 1.1 and 1.2.

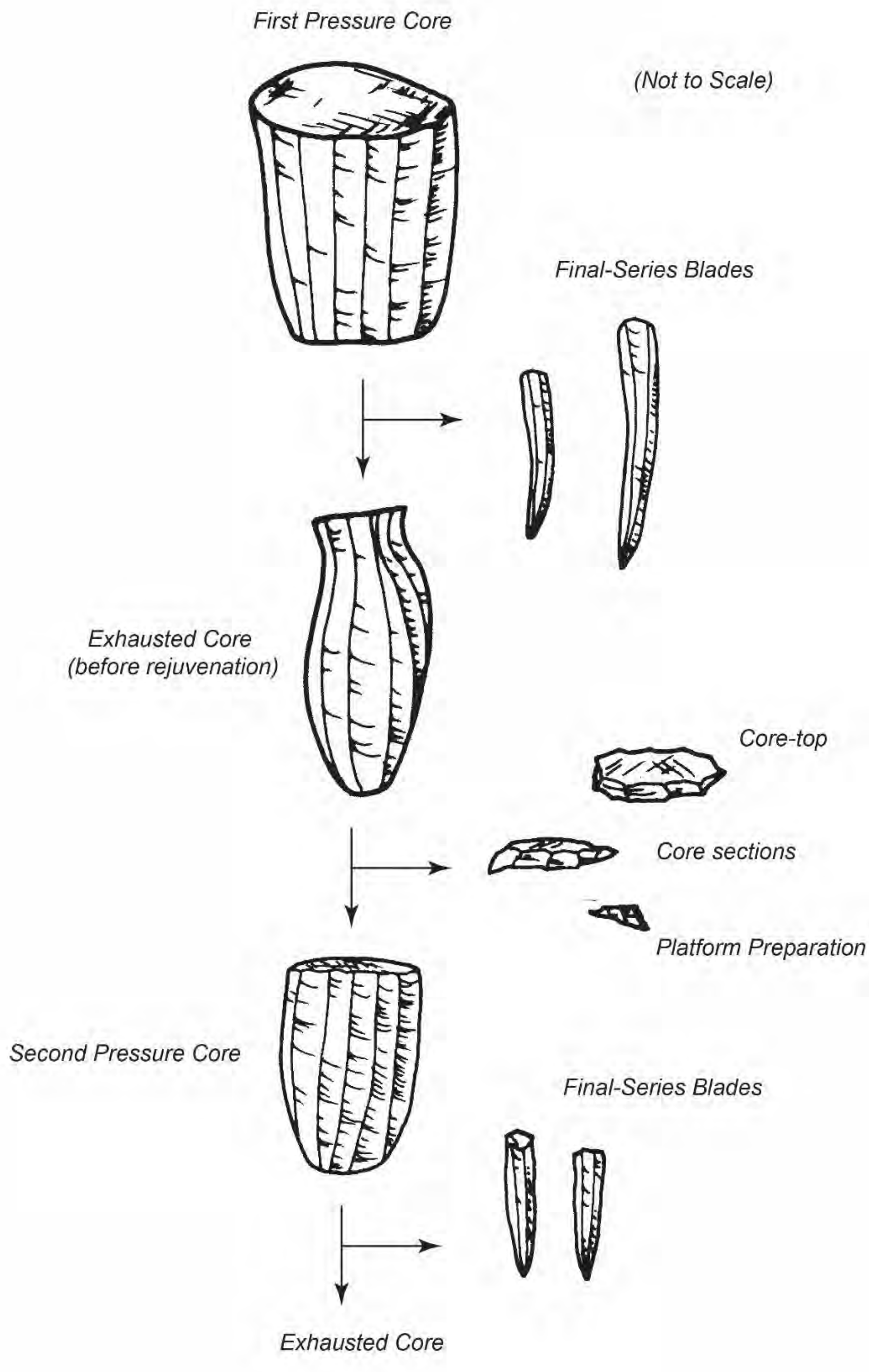


Figure 5-4. Idealized pressure reduction and percussion rejuvenation technique.

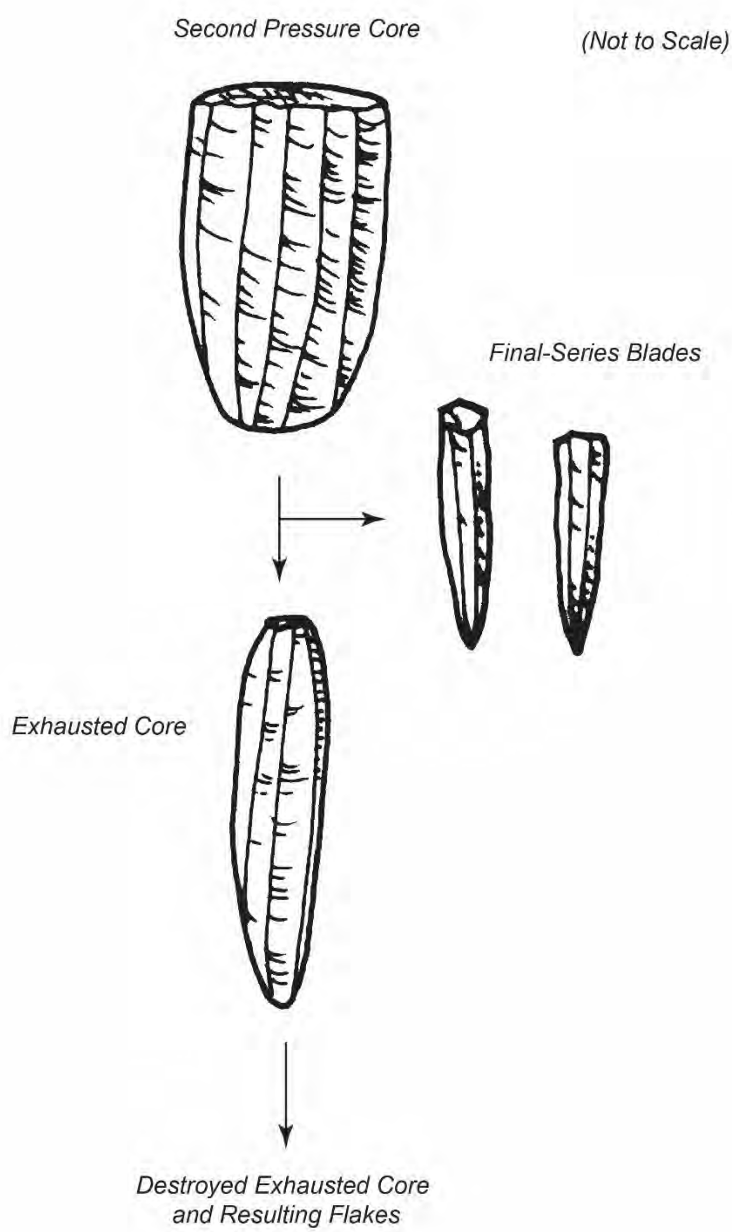


Figure 5-5. Idealized pressure reduction technique after rejuvenation.

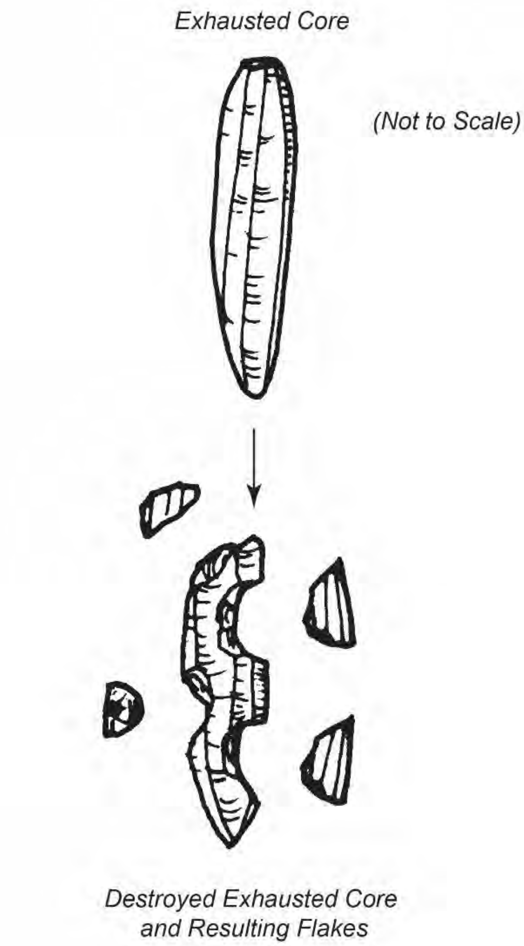


Figure 5-6. Idealized percussion and/or pressure technique to destroy cores.

While analysis did include standard measures of maximum and minimum length, width, thickness, and weight, the analysis also recorded distinct attributes by type of artifact when applicable. For example, exhausted blade-cores and blade-core fragments were often reworked and notched laterally to create objects commonly termed 'eccentrics'. With these artifacts, special care was taken to record the width and depth of the dominant (i.e., widest and deepest) lateral, proximal, or distal notch to better understand potential standards in notching practice and morphology. Also with regards to blade-cores and fragments, refits were also present and fairly easy to discern within a single archaeological special deposit. Refits were recorded and are presented below, but are given greater attention in Chapter 8. For blade artifacts, edge-damage was recorded along with the extent or invasiveness of retouch when applicable. These descriptive attributes should enable a clearer picture about household use of blades as quotidian tools. The attributes for specific artifact types will also enable future use-wear studies. Blade artifacts were also separated by *part* (e.g., proximal, medial, distal) to learn more about the potential intentional alteration (e.g., snapping or sectioning) and use of thin sharp blades. More details like these are provided below for each stage and type of obsidian artifact. Raw tabular data are available via a web link in Appendices G-L and an abbreviated catalog is provided in Appendix E.

Non-blade-core objects are present in the assemblage as well. As mentioned above, these are predominately bifaces, hafted points, and adornments. These are described below and it should be noted that they do not necessarily relate to the local blade production sequence. The sourcing data have already shown that these artifacts have their origins somewhere outside the Maya area (i.e., central Mexico). Lithic analysis too shows the near paucity of bifacial thinning flakes; therefore, little obsidian biface production took place at Caracol. Some research has been presented on certain hafted points from Caracol (A. Chase and D. Chase 2011; Johnson 2010), but a greater treatment is presented below on these and other points.

Chapter 5 is organized in somewhat linear terms employing an idealized reduction sequence common to Mesoamerican obsidian blade studies (see Hirth and Andrews 2002:3-4, Figures 1.1-1.2), thus, I use a standard set of terms and definitions to record standard measurements that enable this study to be situated among other studies in the Maya area and from Mesoamerica in general (see Aoyama 1999; Clark 1988, 1997; Clark and Bryant 1997; Healan 1986; Healan et al. 1983; Hirth 2006; Hirth and Andrews 2002; Moholy-Nagy 2011; Santley et al. 1986; Sheets 1972, 1975; Trachman 2002; Trachman and Titmus 2003). For example, as discussed above, we need not isolate the Caracol obsidian study from others where the primary purpose of core reduction was to produce blades; rather the research is presented as a discovery of the obsidian industry broadly. By applying standard conventions to the analyses, we can better understand how the crafting practice(s) at Caracol differs from other sites or cultures in the Americas. Is the process of core shaping, core rejuvenation and blade production more similar to published studies? And, how does this kind of determination enable the cross-cultural analysis of learning and the deeper understanding in the general history of blade production (Hirth and Andrews 2002)? There are obvious social archaeological implications for organizing the description of lithic technology with these foregrounded goals and these implications will be discussed further in other chapters after the analyzed assemblage is presented.

This study diverges slightly from others in that, as it describes the stages of reduction, defines the categories, and presents the associated attributes per artifact type, it includes the associated context. A total of 1,769 investigated contexts included obsidian and were analyzed. The bulk of contexts that yielded obsidian were from 1,584 refuse contexts or construction fills, followed next by 124 human burials, or 121 when three burials (C12, C19, and C87) are excluded, and lastly 61 caches (Figure 5-7; Figure 5-8; Figure 5-9). Including context is explicitly intended to foreshadow later discussions of where these objects were used and deposited in the past. By defining each object by attribute and seeing the context of recovery, a picture of the obsidian industry begins to emerge where the relationships between materials, objects, places, and persons becomes visible. These contexts also represent a stop in the itinerary of obsidian as it moved about between merchant, crafter, market, and consumer.

Here I present a slightly divergent *chaîne opératoire* approach that results in a more eventful, historicized, temporal, and intentionally fractal notion of obsidian transformation and mobility. For example, for the ancient Maya at Caracol, macro debitage was an initial stage in core reduction, but it was also connected to the materiality of some household rituals. These stages in the itinerary are temporally and very likely spatially different practices, but are linked by technology and the knowledge of obsidian reduction. So unlike other Mesoamerican studies, I attempt to see obsidian objects at Caracol as part of a moving flow of relations. The presence of macrocore shaping debitage and from specific contexts helps in the recognition of the initial moments of the creation of a core, and at the same time these same core-shaping objects were retouched (or not retouched), ritualized, and included in ritual deposits.

After removal from a macrocore, they may have been curated and later moved, circulated, and/or exchanged as part of some other set of relations that moved the macro piece away from a workshop in order to provision a ritual event at a Caracol residence. The possible set of relations that took place outside the craft workshop are *buried* in their archaeological context of recovery. Macrocore-shaping debitage pieces, like other objects, were a ritualized item from the blade industry and are recovered from both burial and caches. This kind of observation will be described below for each stage in the obsidian industry at Caracol, when applicable.

To better quantify these associations each artifact within a reduction stage is separated into it respective context of recovery and a probability (at the 95% confidence level or $p = 0.05$) is provided. The probability statistic or *t-test* (see Drennan 2010:156-157) in the below dataset calculates a statistical range of probability or statistical likelihood of encountering a given artifact in a given archaeological context. By understanding the associations between artifact type and context, the probability aids in better estimating how each kind of artifact was utilized in the past and how we might be able to better predict the very active and intentional behavior that took place in the past. Ultimately, the inclusion of context, descriptive statistics, and envisioning obsidian as a moveable material provides greater depth to how a workshop's reduction debitage may have been managed as well as the connections obsidian crafters shared with non-obsidian crafting residences.

In summary, this chapter outlines the broad technological stages and artifact types seen in the Caracol obsidian assemblage, and at the same time, presents each artifact in terms of its archaeological context of recovery. All these data enable a more specific discussion of techniques of obsidian crafting or the technological choices of crafters. These technological choices, or techniques of the body (Lemonnier 2013; Mauss 1973), are representative of the kinds of relationships, or correspondences (Ingold 2012), crafters had with stone. The definitions below should also allow this study to be compared to others from Mesoamerica. The reduction stages and artifacts types presented below begin with core-shaping macro debitage and not with obsidian nodules. There is no evidence to suggest that obsidian nodules were worked at Caracol; they were likely worked elsewhere -at their respective quarry sites.

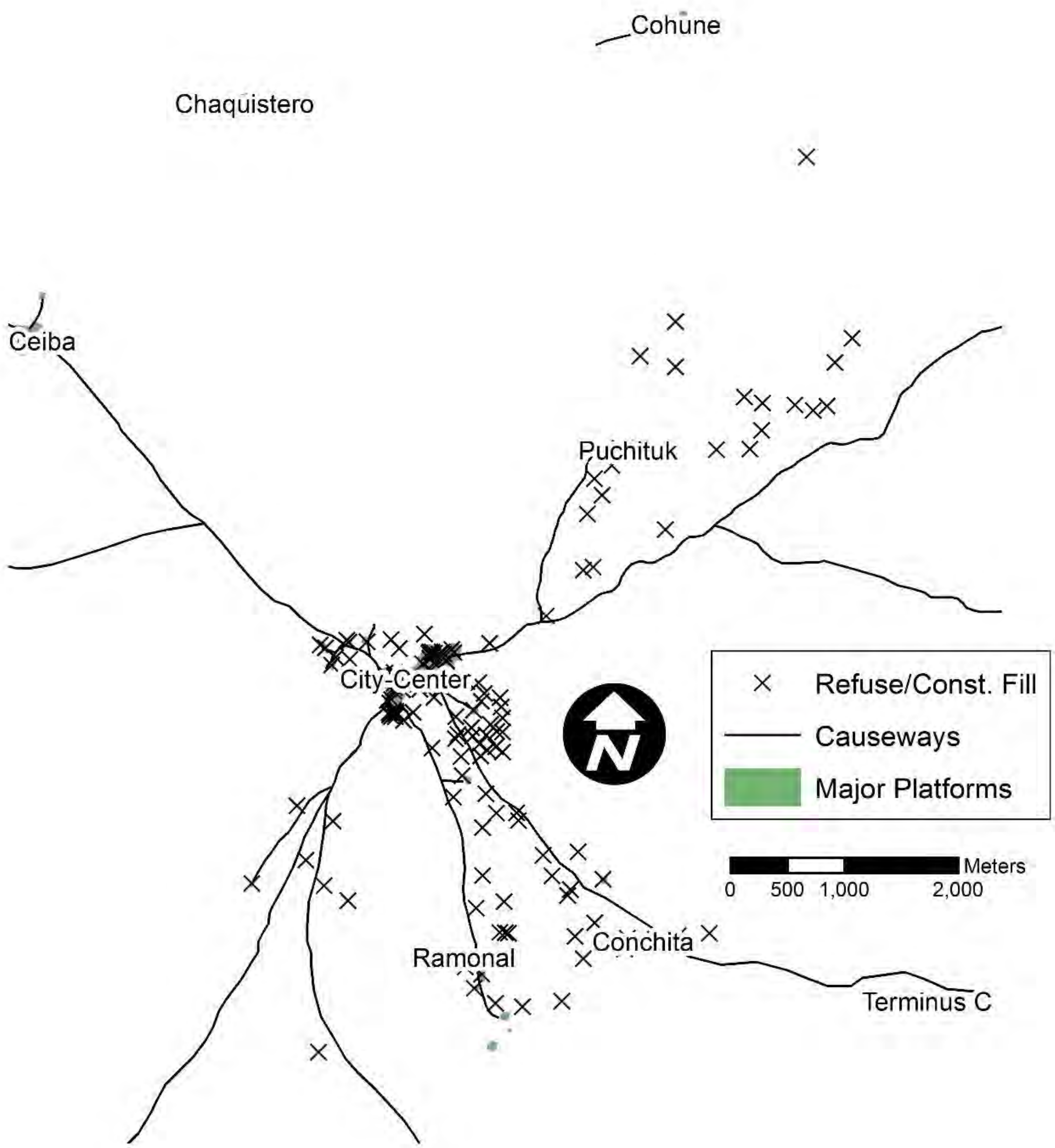


Figure 5-7. Distribition of refuse and/or construction fill contexts containing obsidian. Major platforms are labeled. Note that 1,584 refuse/construction fill contexts were analyzed for obsidian and some of these overly one another in the distribution map.

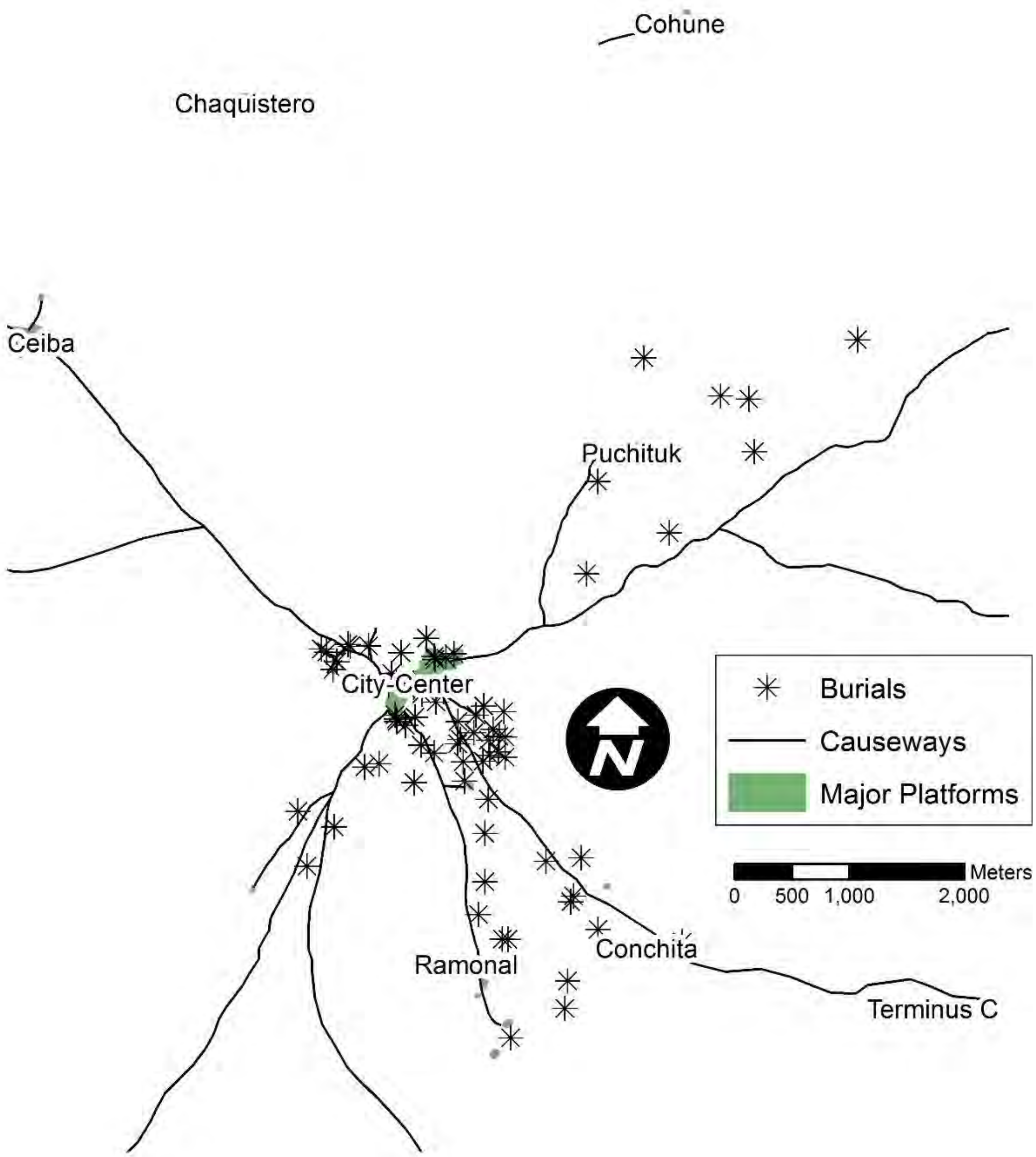


Figure 5-8. Distribition of burial contexts containing obsidian and presented in tables. Major platforms are labeled. Note that 124 human burials were analyzed for obsidian and some of these overly one another in the distribution map.

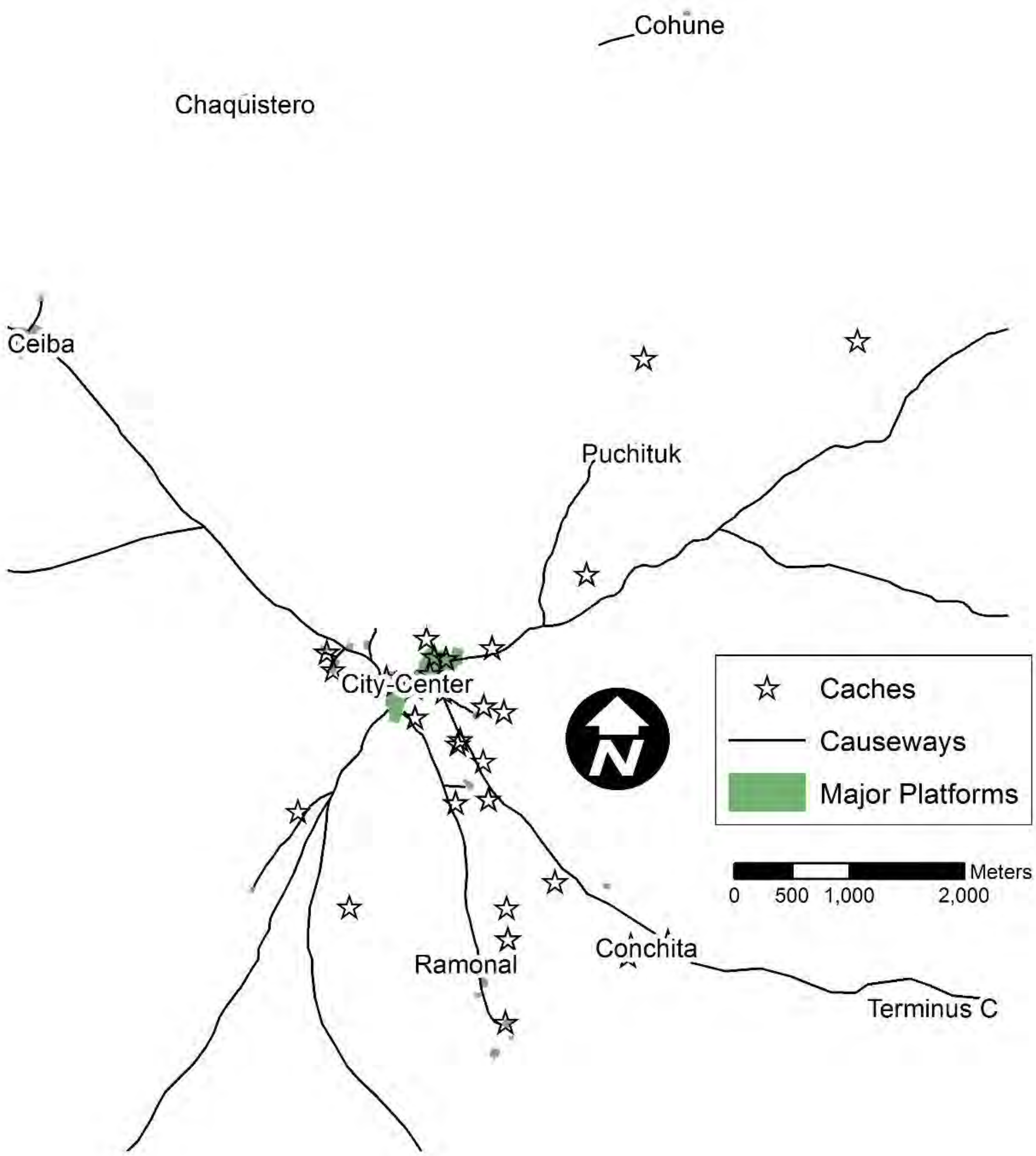


Figure 5-9. Distribition of cache contexts containing obsidian and presented in tables. Major platforms are labeled. Note that 61 caches were analyzed for obsidian and some of these overly one another in the distribution map.

Percussion Techniques: Core Shaping

Macro Debitage and Objects from Macro Debitage

Pieces of macro debitage are typically some of the larger and more robust obsidian artifacts from the obsidian blade industry. They are from the initial stages of core reduction and, thus, if they are present in an archaeological collection, demonstrate that polyhedral blade-core production was performed on site at a workshop. On the other hand, if there is a paucity of these kinds of objects in a collection, then the operating proposition is that the crafters obtained already prepared pressure cores (Hirth 2006). As I have already stated in Chapter 5, Caracol appears to have imported roughed-out obsidian macrocores, some with cortex, rather than importing already prepared polyhedral pressure blade-cores from outside Caracol's borders. Core shaping debitage was associated with the El Chayal and Ixtepeque sources. The presence of these types of debitage in the collection also shows that obsidian crafters at Caracol possessed the knowledge and skill to create highly standardized polyhedral pressure blade-cores. Despite no actual workshop being excavated at Caracol, there are many contexts with these objects and, therefore, it can be argued that the processes that resulted in these kinds of objects were taking place somewhere within Caracol's settlement rather than being imported from elsewhere.

Macro debitage or core-shaping debitage is generally larger than other kinds of debitage. These are mainly flakes, but can also be more blade-like, although very different in attributes to formal obsidian blades (see below). Macro flakes are removed from a macrocore – those cores produced from the percussion reduction of quarried nodules - with rough, hard or soft-hammer percussion. Macro debitage is usually curved from proximal to distal end, with steep dorsal ridges. Some of the dorsal surface can have cortex. The dorsal surface is defined not only by its irregular arrises, but also by the negative flake scars indicating that flakes were struck from varied directions. One goal of removing these flakes is to create a flat surface either for platform preparation or to later remove blades or to create flat linear adjacent surfaces to remove longer macroblades or ‘small’ percussion flakes (see below). This process continues to flatten the longer lateral core surfaces perpendicular to the anticipated blade-core platform. Table 5-1 shows the attributes for this artifact category and metric averages from the macro debitage assemblage. This table also summarizes the suite of macro debitage analyzed and includes both retouched and non-retouched (i.e., utilized and unutilized) objects. Figure 5-10 shows a sample of macro debitage. The context of retouched core shaping debitage or *objects from blade-core shaping debitage* will be discussed in more detail further in a sub-section of this chapter (see Figure 5-14).

Items of macro debitage were measured for length, width, thickness, and weight. Most macro debitage were not retouched further (n=387), while others were (n=31). Retouched macro objects – those pieces of debitage that exhibit extensive edge wear or retouch – were sorted into three broad categories: (1) edge-modified tools that have visible edge damage using 10-20x magnification; (2) drills that have a salient bit or tip; and (3) notched objects that have a single or repeated notch either unilaterally, bilaterally, and/or distally. Many notched objects have been traditionally termed “eccentrics,” but I avoid the use of this term. Referring to these artifacts as eccentrics obscures quantitative and qualitative attributes such as notching. These attributes may be relevant to their use as tools and/or any standardized practice by either obsidian crafters or household consumers to modify these objects prior to deposition. When present, measurements of the most prominent notch were taken for notch width (or opening) and depth.

Table 5-1. Attributes and descriptive statistics for types of macro objects.

Type by Attribute	Macroflake	Macroblade	Macroflake with cortex	Macroblade with cortex	Object from Macroflake	Object from macroblade	Totals	%
N=	235	41	101	10	19	12	418	2.34
Avg. Max length (mm)	37	47.1	36.5	44.2	36.8	46.8		
Avg. Max width	24.6	22.1	24.2	18	29.8	20.6		
Avg. Max thickness	8.3	7.6	8.5	5.5	7.8	6.6		
Avg. Max weight (g)	6.3	9.1	6	3.7	7.2	5		
Avg. Min length	25.9	29.5	22.9	17.8	-	-		
Avg. Min width	16.1	15.2	15.3	13.4	-	-		
Avg. Min thickness	6	4.72	4.3	3.5	-	-		
Avg. Min weight	1.7	1.3	1.2	0.8	-	-		
Total weight (g)	937.21	224.85	352.4	11.5	136.4	60.42	1,722.78g	
Sub-type (n=)								
Edge-modified	-	-	-	-	10	2		
Drill	-	-	-	-	-	1		
Notched	-	-	-	-	9	9		
Absent	-	-	-	-	-	-		
Single	-	-	-	-	5	3		
Repeated	-	-	-	-	4	6		
	-	-	-	-	-	-		
Notch location (n=)	**-**	**-**	**-**	**-**	**-**	**-**		
Unilateral asym	-	-	-	-	-	2		
Unilateral sym	-	-	-	-	-	-		
Unilateral	-	-	-	-	-	2		
Bilateral asym	-	-	-	-	4	1		
Bilateral sym	-	-	-	-	1	1		
Bilateral	-	-	-	-	2	3		
Distal	-	-	-	-	2	-		
Avg. Notch width (mm)	-	-	-	-	9.2	6.8		
Avg. Notch depth (mm)	-	-	-	-	4.7	2.5		
Comments								

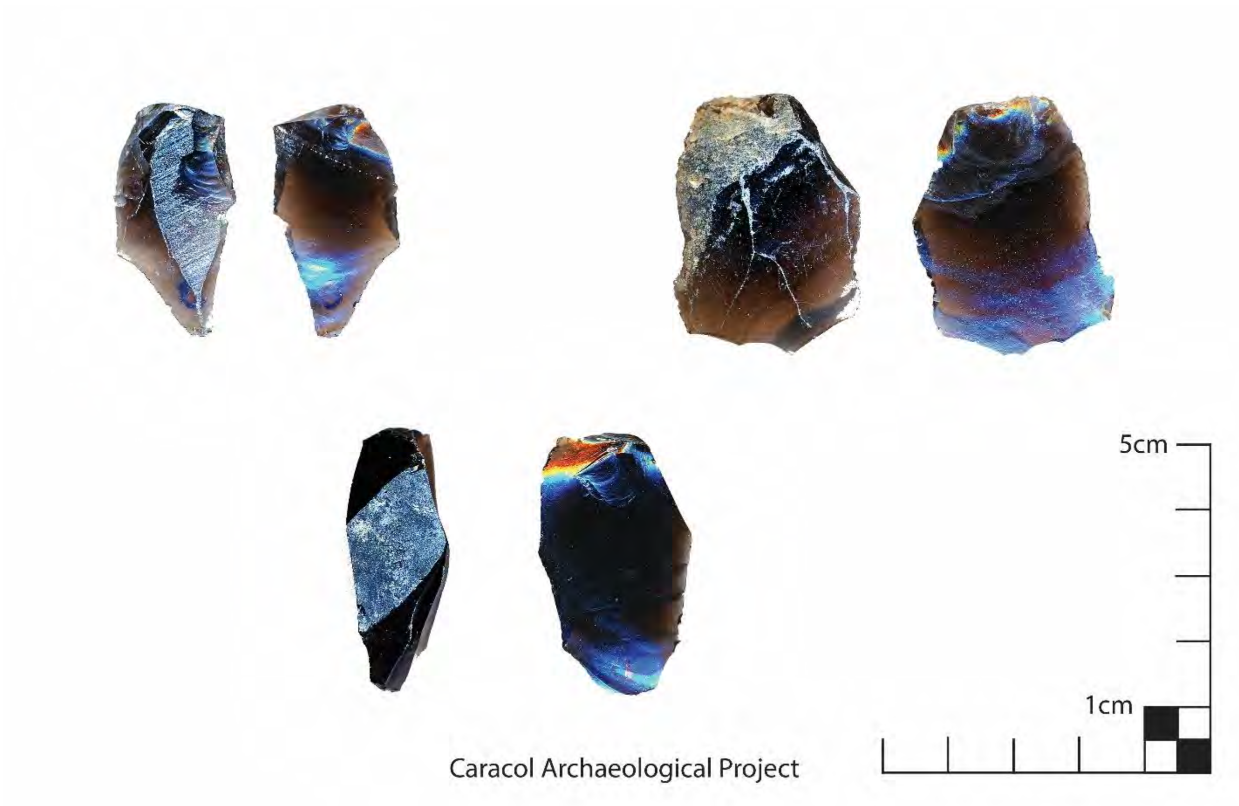


Figure 5-10. Sample of three macro debitage pieces with traces of cortex. Dorsal surface on left and ventral surface on right.

Contexts of macro debitage: The context of recovery for macrocore shaping artifacts varies, but the vast majority (n=342 or 81.8%) come from three burials (Structure A3, S.D.C12A-2 [n=261]; Structure L3, S.D.C19A-2 [n=29]; Structure A34, S.D.C87B/E-1 [n=52]), specifically from deposits above the vaulted burial chambers (see Chapter 8 where these three context are described in detail). Of macro objects from burials (n=6 occurrences), only nine are utilized or retouched and may represent deposited tools. Caches have the next highest percentage (n=17 occurrences) of macrocore shaping objects (n=37 or 8.8%) and fifteen of these (40.5%) are utilized or retouched. Note that 11 of the 37 (27.9%) from caches are notched. Lastly, refuse/fill deposits (n=26 occurrences) make up the vast majority of recovery contexts, but yielded the least amount of macro core shaping objects (n=27 or 6.4%), only seven of which are visibly utilized or retouched (Table 5-2). One pattern that seems clear is that there is a significantly higher probably for recovering macro debitage from caches (*P*=27.9 ± 9.59) and an extremely low probability of recovering them from refuse or construction fills (*P*=1.6 ± 0.51). The spatial distribution of macro debitage is not clustered around any given area and is widely dispersed throughout the sampled area (Figure 5-11).

Table 5-2. Distribution of macro debitage by broad context.

Contexts/Assoc.	Macroflake	Macroblade	Macroflake with cortex	Macroblade with cortex	Object from macroflake	Object from macroblade	Total n=	%	P=
Refuse/fill (n=)	14	4	2	0	7	0	27	6.45	1.6 ± 0.51
Edge-modified	-	-	-	-	6	-			
Notched	-	-	-	-	1	-			
Burial (n=)	209	31	95	10	4	5	354	84.68	2.5 ± 2.25*
Edge-modified	-	-	-	-	1	1			
Drill	-	-	-	-	-	1			
Notched	-	-	-	-	3	3			
Cache (n=)	12	6	4	0	8	7	37	8.85	27.9 ± 9.59
Edge-modified	-	-	-	-	3	1			
Notched	-	-	-	-	5	6			
Total N=	235	41	101	10	19	12	418	2.34	

*Probability excluding three above tomb deposits.

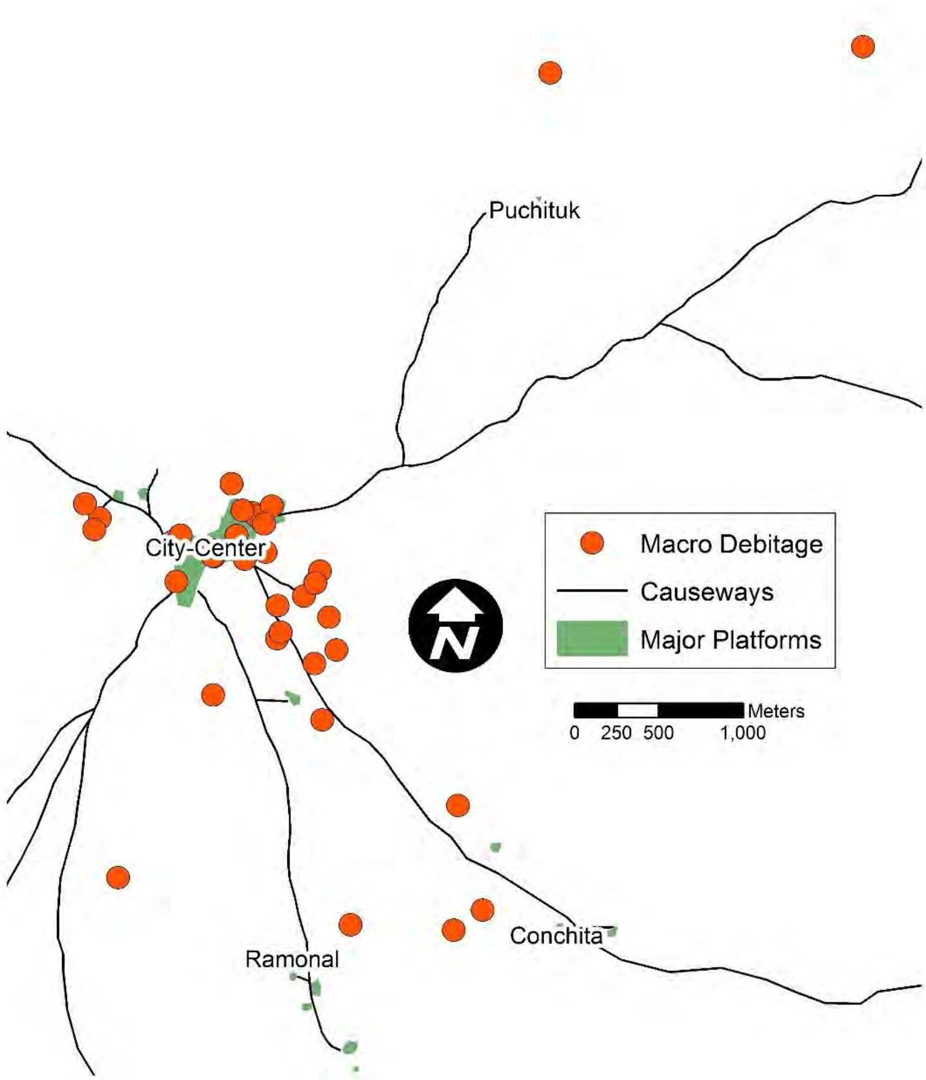


Figure 5-11. Distribution map of macrocore shaping debitage.

Small Percussion Debitage

Blade-core percussion debitage is varied and does not always fit into an idealized sequence. Because of the trouble of accurately identifying different kinds of percussion debitage, all debitage that was not macro debitage (see above) and also clearly not first-series or second-series blades, was lumped into the *small percussion debitage* type. These have been described by a number of obsidian analysts and share many morphological characteristics with these studies (Hirth 2006; Trachman 2002). The first obvious morphological feature to discuss is that many, if not all, of these flakes/blades are fairly large when compared to other forms of debitage excluding macro pieces. They are, however, markedly thinner and relatively short. Hirth (2006:313) describes small percussion blades (and flakes) as "paralleled sided flakes with percussion flake scars on their dorsal surface and developed bulbs of force on their ventral sides indicative of percussion detachment." Although Hirth (2006:313) describes these as 1.5cm or less in width, the percussion artifacts from Caracol are slightly wider on average (Table 5-3). Small percussion debitage at Caracol is generally as wide as it is long. These kinds of flakes have a "U" shaped (concave) cross section, prevalent wide striking platforms, and often have feather terminations (Figure 5-12). The resulting removal of these flakes would create a flat. somewhat concave. lateral face on a core. The protruding platform created from removing two adjacent percussion flakes could have provided a good striking platform (or pressure platform) for removal of initial-series blades or further percussion flake or blade removal to further shape the core. This likely indicated a local variation in core shaping. Additionally, Hirth summarized central Mexican workshops where he demonstrated that most cores were immediately rejuvenated prior to blade removal (Hirth 2006:88-90). Caracol appears to have imported roughed out obsidian macrocores with remnants of cortex, so the associated range and variation of percussion debitage is likely to be very different than if only formed polyhedral pressure blade-cores were imported into Caracol.

Table 5-3. Organization of analysis attributes and descriptive statistics about types of small percussion debitage.

Type by Attribute	'Small' percussion flake/blade	Object from 'small' percussion	Totals	%
N=	1,359	3	1,362	7.62
Avg. Max length (mm)	33.6	24.9		
Avg. Max width	20.5	2.6		
Avg. Max thickness	4.5	5.2		
Avg. Max weight (g)	2.3	2.4		
Avg. Min length	20.7	-		
Avg. Min width	14.4	-		
Avg. Min thickness	3.2	-		
Avg. Min weight	0.7	-		
Total weight (g)	2,356.4	7.2	2,363.6g	
Sub-type (n=)				
Disk	-	1	1	
Notched	-	2	2	
Absent (-)	-	-	-	
Single	-	1	1	
Repeated (double)	-	1	1	
Notch location (n=)	-	-	-	
Unilateral asym	-	-	-	
Unilateral sym	-	1	1	
Unilateral	-	-	-	
Bilateral asym	-	-	-	
Bilateral sym	-	1	1	
Bilateral	-	-	-	
Distal	-	-	-	
Avg. Notch width (mm)	-	12.8	-	
Avg. Notch depth (mm)	-	8	-	
Comments				

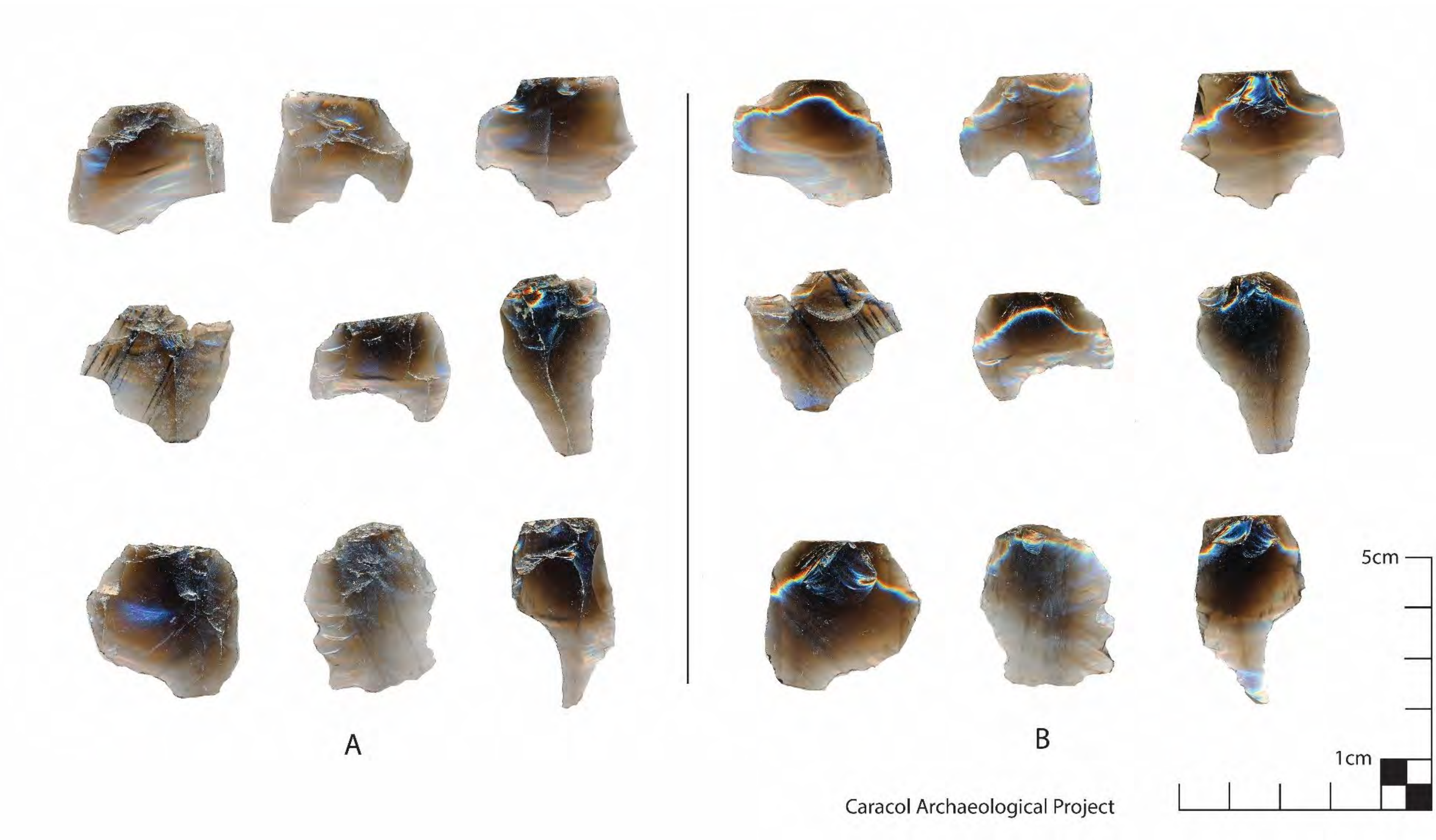


Figure 5-12. Sample of small percussion debitage. (A) dorsal view; (B) ventral view

Contexts of small percussion debitage: Small percussion flakes/blades, like other core-shaping debitage, were recovered in great numbers from above burial chambers. The vast majority (n=1,347 or 98.8%) of these debitage have been recovered from above burial chambers in Structures A3 (S.D.C12A-2, n=1,243) and A34 (S.D.C87B/E-1, n=100). This phenomenon of including these objects in association with burials, although in far fewer amounts, is also recorded from Structures L3 (S.D.C19A-1, n=2) and B20 (S.D.C1H-2, n=2). Refuse/fill contexts account for the next highest amount of these types of debitage (n=9). Further analysis of these seven refuse/fill deposits is necessary to account for their presence in these contexts. A number of explanations are likely, however, and include that these objects were used as cutting tools. The distal feather termination of these tools with the wide robust proximal portion could have provided residences with a tool resource. Another explanation may be that these are residual traces of obsidian workshop practices. This later interpretation will be explored in future studies.

Six 'small' percussion flakes/blades have been recovered from cache contexts. Interestingly, all of these artifacts come the same excavation (C184B) and from three separate caches within an eastern structure (Structure F39): S.D.C184B-4, n=2; S.D.C184B-5, n=2; and a third cache not assigned a special deposit number (n=2). This potential, yet unassigned, cache is associated with a niche in front of a shrine room and a burial. Like macrocore shaping debitage, there is a higher probability of recovering these small percussion objects from caches (P=4.9 ± 4.61) in contrast to burials (P=1.7 ± 1.95) or refuse/fill (P=0.4 ± 0.26) contexts (Table 5-4). The spatial distribution of this debitage type is somewhat clustered around the city center within an approximate 500-

meter radius (Figure 5-13).

Table 5-4. Distribution of small percussion debitage by broad context.

Context/Assoc.	'Small' percussion flake/blade	Object from 'small' percussion	Totals	%	P=
Refuse/fill (n=)	9	0	9	0.66	0.4 ± 0.26
Burial (n=)	1,346	1	1,347	98.89	1.7 ± 1.95*
disk	-	1			
Cache (n=)	4	2	6	0.44	4.9 ± 4.61
notched	-	2	-	-	
Total N=	1,359	3	1,362	7.62	

*Probability excluding three above tomb deposits.

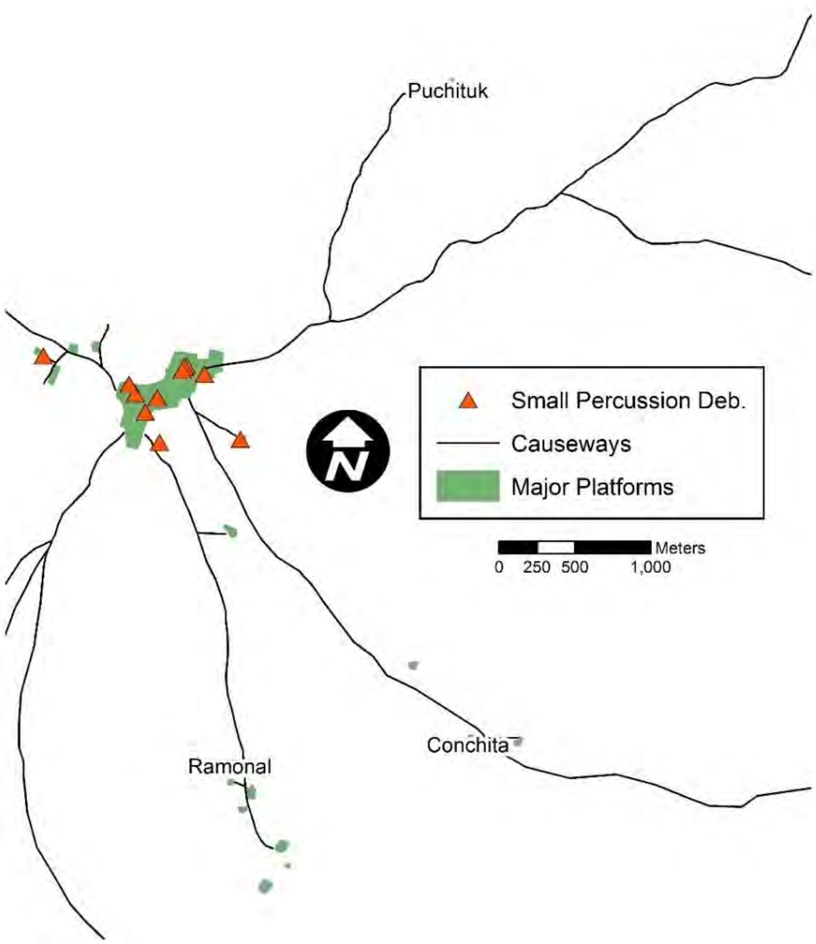


Figure 5-13. Distribution of small percussion debitage sample from Caracol, Belize. Note that most are clustered around the city center. Note Operation C184B is the western most plotted item.

Objects from Blade-Core Shaping Debitage Summary and Contexts

The bulk of core-shaping debitage is unmodified, but a small portion of the assemblage exhibits edge use damage or intentional edge modification. A total of 34 (or 1.9% of core-shaping debitage) objects were crafted from core-shaping debitage. These include edge-modified flakes (probably used as cutting tools), several notched flakes, two drills, and a single disk. All these were modified through either use on harder materials or edge-modified through percussion and pressure flaking. A sample of these objects is presented in Figure 5-14 and summarized in Table 5-5.

The spatial distribution of utilized macro debitage is more spread out across the sampled area, as the above figure has shown (Figure 5-11, Figure 5-15). Small percussion utilized debitage is localized at and just outside the city center (Figure 5-15). Furthermore, contextual analysis of these artifacts also shows that half (n=17, or 50%) were recovered from caches while just under 30% are from burials; therefore, the majority of objects from macrocore-shaping debitage are typically ritualized in either burials and more often caches. Lastly, all but one other artifact type is from refuse and/or construction fill contexts and classified as edge-modified tools.

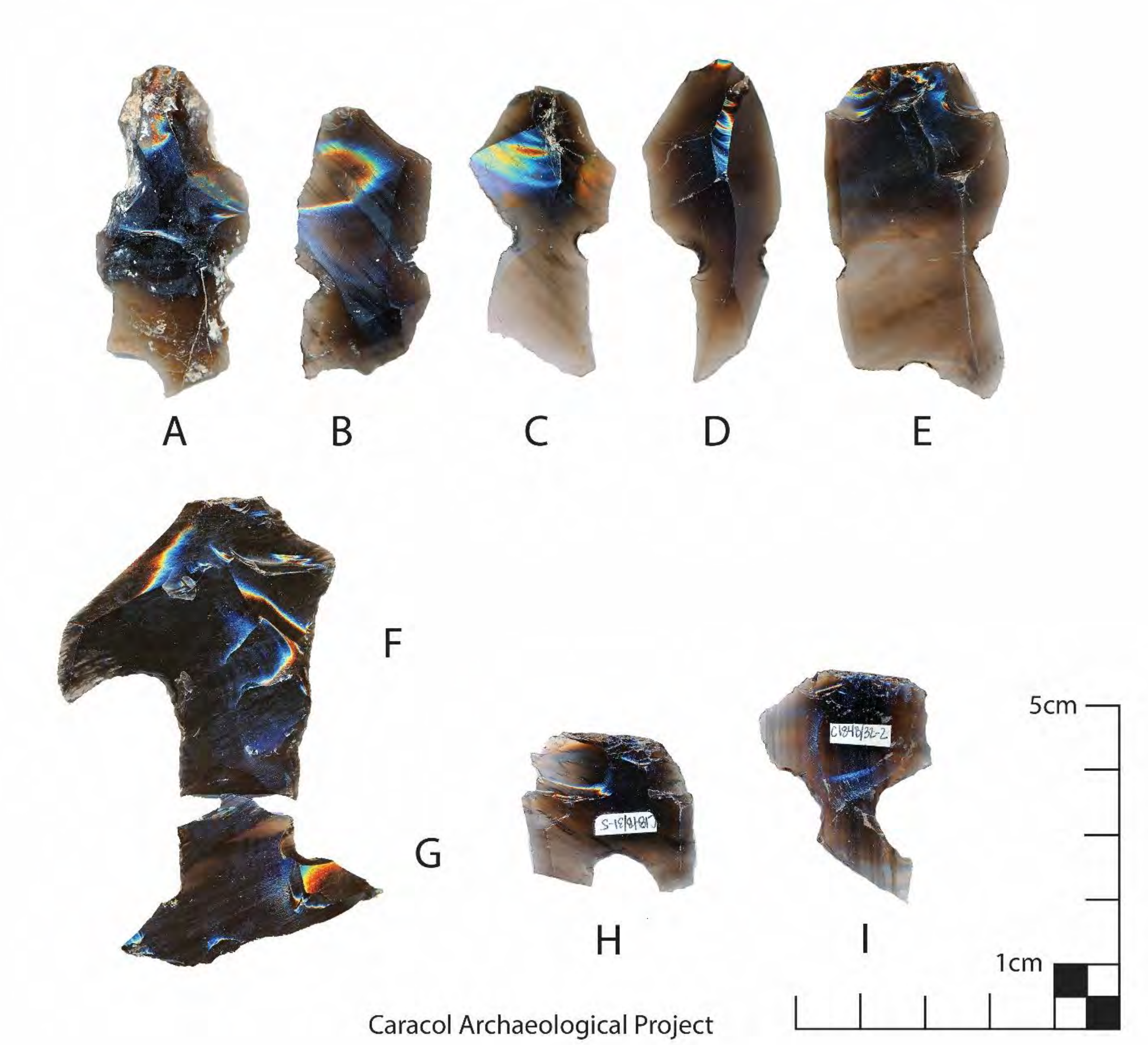


Figure 5-14. Sample of objects from blade-core shaping macro debitage (A-G) and small percussion debitage (H-I). Dorsal surface is shown. (A) C39B/6-5; (B) C177B/52-29; (C) C177B/52-25; (D) C177B/52-24; (E) C177D/36-3; (F) C189B/23-7; (G) C189B/23-1; (H) C184B/31-5; (I) C184B/32-2.

Table 5-5. Contexts of objects from blade-core shaping debitage.

Contexts/Assoc.	Object from macroflake	Object from macroblade	Object from 'small' percussion	Total n=	%
Refuse/fill (n=)	7	0	0	7	20.5
edge-modified	6	-	-		
notched	1	-	-		
Burial (n=)	4	5	1	10	29.5
edge-modified	1	1	-		
drill	-	1	-		
notched	3	3	-		
disk	-	-	1		
Cache (n=)	8	7	2	17	50
edge-modified	3	1	-		
notched	5	6	2		
Total N=	19	12	3	34	100

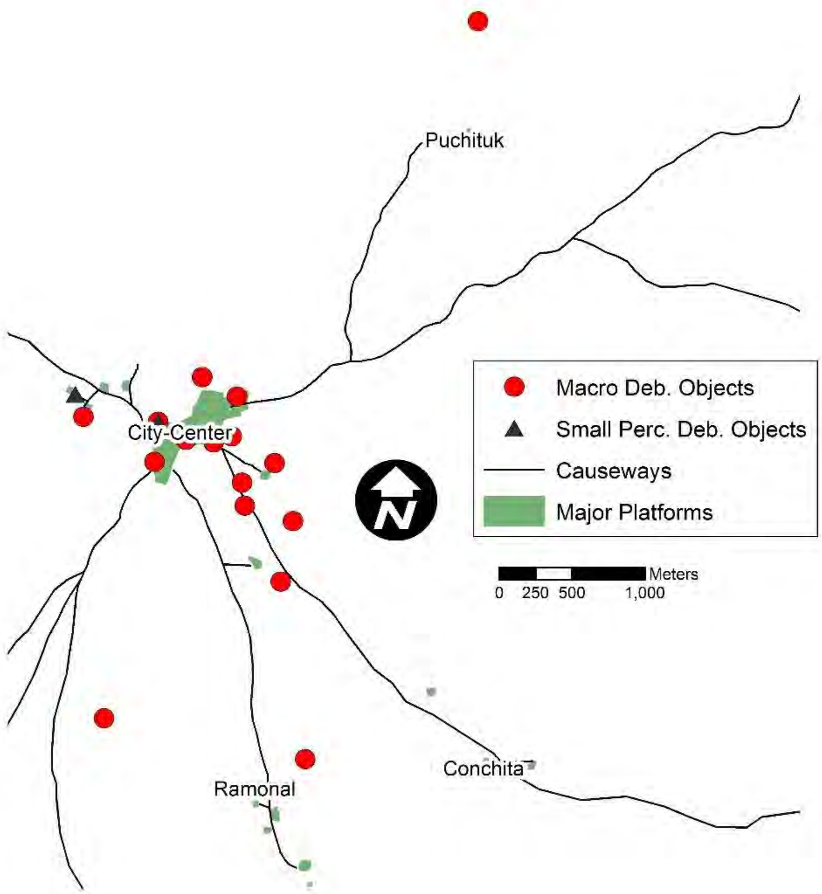


Figure 5-15. Distribution map of objects from macro and ‘small’ percussion debitage.

Pressure Techniques: Blade Production

The dominant reduction method of obsidian production at Caracol was the pressure technique to remove blades from blade-cores. This practice can be stated broadly for most studies of Mesoamerican obsidian lithic technology. Earlier studies of Mesoamerican blade technology have traditionally used a three-part division when discussing pressure techniques on polyhedral blade-cores. The first stage in pressure reduction of a core aids in regularizing the core for production of longer more parallel sided blades (Hirth 2006:176). Many analysts divide the initial pressure stages into *first-series blades (1's)* and *second-series blades (2's)* followed by the final stage or *third-series blades (3's).* Due to time constraints in sorting the large obsidian collection and the fragmentary nature of many blade artifacts these *first*- and *second-series* blades were lumped into the *initial-series* classification (Table 5-6). Other studies often lump these two classifications as well or state that *first*- and *second-series* blades are difficult to identify due in part to time constraints and the subtle differences between *first*- and *second-series* blades (Hirth 2003:176; Hruby 2006, Trachman 2002:109). Further study of these *initial-series* blade artifacts would probably demonstrate subtle differences that would fit within more specific classifications, like *first*- and *second-series* blades.

Initial-Series Blades (1's and 2's)

The *initial-series (1's and 2's)* pressure stage is identified in the Caracol assemblage and follows typical pan-Mesoamerican technical definitions. These initial-series blades are defined by their irregular, non-parallel, and often wavy converging dorsal ridges and converging lateral margins (Figure 5-16). Hirth (2006:309) states, "that [initial-series blades] have percussion flake scars on their dorsal surface and pressure attributes on their ventral surface." These are distinctly different from *final-series blades* that exhibit pressure attributes on both their dorsal and ventral surfaces. Final-series blades exhibit straight lateral sides and parallel dorsal ridges (see below). Initial-series blades recovered from Caracol are also shorter on average (e.g., average range of complete blades: 23.8 mm to 43.3 mm) when compared to final-series blades (e.g., average range of complete blades: 40.1 mm to 61.2 mm). A total of 4,008 initial-series blades and blade fragments have been recovered from all contexts at Caracol, although the majority (n=3,795 or 94.6% of all blades) were excavated from three above tomb burial deposits containing macrocore shaping debitage. The vast majority of these 3,795 artifacts were blade fragments. These artifacts were so numerous in two excavated lots that the "complete and fragments" category was created to efficiently sort these. As stated above, further analysis is necessary to better classify these kinds of blades. Despite some lumping as shown in Table 5-6, the presence of initial-series pressure blade artifacts demonstrates that pressure blade-cores were being shaped at Caracol and that a minority of these blades were used further as tools. exhibiting edge-damage or retouch edges (n=40 or 0.99%). Initial-series blades that exhibit edge-wear or retouch include edge-modified tools (e.g., blades with macroscopic edge-wear), notched or retouched blades, and a single projectile point (Figure 5-16).

Table 5-6. Showing initial-series (1's, 2's) blades by attribute.

Type by Attribute	*Complete*	*Complete and Fragments*	*Proximal*	*Proximal/ Medial*	*Medial*	*Medial/ Distal*	*Distal*	Totals	%
N=	89	3,710	90	43	64	1	11	4,008	22.44
Avg. Max length (mm)	43.3	-	24.4	29	22.5	39.7	26.2		
Avg. Max width	15.7	-	13.9	12.5	12.4	13.3	11.2		
Avg. Max thickness	3.8	-	3.2	3.2	2.8	2.8	2.1		
Avg. Max weight (g)	2.7	-	1.2	1.2	0.8	0.9	0.5		
Avg. Min length	23.8	-	20.7	19.1	15.1	-	20.8		
Avg. Min width	10.4	-	12.5	11.7	9.8	-	10		
Avg. Min thickness	2.6	-	2.9	2.9	2	-	2.3		
Avg. Min weight	0.5	-	0.6	0.6	0.3	-	0.3		
Total weight (g)	108.2	2,539	74.1	43.9	39.7	0.9	5.2	2,811g	
Sub-type (n=)									
Edge-modified	1	-	7	11	9	-	-	28	
Overhang removal	32	-	4	1	1	-	-	38	
Point	1	-	-	-	-	-	-	1	
Notched n=	10	-	-	1	-	-	-	11	
Single	-	-	-	-	-	-	-		
Repeated	10	-	-	1	-	-	-	11	
Notch location (n=)	-	-	-	-	-	-	-		
Unilateral asym	-	-	-	-	-	-	-		
Unilateral sym	-	-	-	-	-	-	-		
Unilateral	-	-	-	-	-	-	-		
Bilateral asym	-	-	-	-	-	-	-		
Bilateral sym	-	-	-	-	-	-	-		
Bilateral	10	-	-	1	-	-	-	11	
Distal	-	-	-	-	-	-	-		
Avg. Notch width (mm)	4.8	-	-	3.9	-	-	-		
Avg. Notch depth (mm)	2.6	-	-	1.9	-	-	-		
Comments									

Figure 5-16. Sample of initial-series blades.

Contexts of initial-series blades (1's and 2's): The vast majority of initial-series blades come from three separate above burial tomb deposits. These large sample deposits provide a proxy measure for the range of blade production-related debitage that would have originally occurred at a local workshop or workshops. Moving this amount of blade-core shaping debitage certainly required careful cooperation and logistics. These above tomb assemblages are discussed further in Chapter 8, but here it is important to point out that a far lesser quantity has been recovered from household refuse/fill contexts (n=183) and even less so from caches (n=30). In terms of the household refuse/fill material, it is likely that these initial-series blades were in circulation much like the final-series blades and, thus, were used as a source of tool stone for daily tasks. The cache contexts, on the other hand would have been selected specifically to be placed within these contexts. From the few cache contexts that had initial-series blades (n=8 occurrence out of n=61 caches) as part of the assemblage is unlikely that these were regularly used for ritual events (*P*=11.5 ± 6.82). The spatial distribution of initial-series blades is much like final-series blades (see below) in that a wide distribution is observed (Table 5-7). Although the vast majority has been recovered from city center burial deposits, others were more widely distributed as tool stone for residential use far outside the city center (Figure 5-17).

Table 5-7. Contexts by type of initial-series (1's and 2's) blades.

Context/Assoc.	Complete	Complete and Fragments*	Proximal	Proximal/ Medial	Medial	Medial/ Distal	Distal	Totals	%	P=
Refuse/fill (n=)	11	77	23	33	33	1	5	183	4.56	5.2 ± 0.91
Edge-modified	-	-	6	11	7	-	1			
Overhang removal	-	-	-	1	-	-	-			
Burial (n=)	68	3626	62	5	28	0	6	3795	94.68	8.3 ± 4.16*
Edge-modified	-	-	1	-	1	-	2			
Overhang removal	32	-	-	-	-	-	-			
Notched	1	-	-	-	-	-	-			
Point	1	-	-	-	-	-	-			
Cache (n=)	10	7	5	5	3	0	0	30	0.75	13.1 ± 7.21
Edge-modified	-	-	-	-	2	-	-			
Overhang removal	1	-	4	-	-	-	-			
Notched	9	-	-	-	-	-	-			
Total N=	89	3710	90	43	64	1	11	4008	22.44	

*Probability excluding three above tomb deposits.

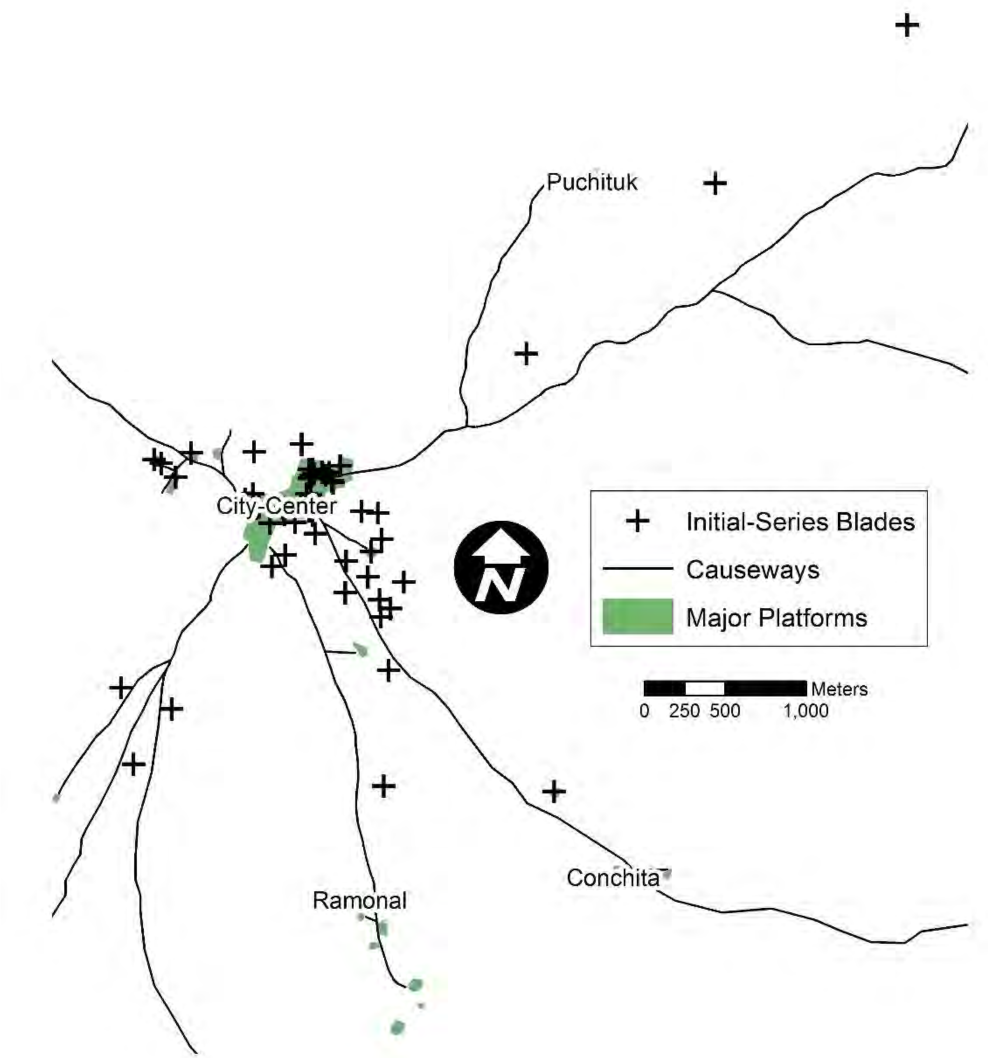


Figure 5-17. Distribution map of initial-series blades (1’s and 2’s).

Final-Series Blades (3's)

Final-series prismatic blades comprise about a fourth (38.01%) of the entire analyzed Caracol obsidian collection. These types of pressure blades are highly standardized and are parallel sided with medially parallel yet distally converging dorsal ridges created from previously removed pressure blades. These blades have defined pressure platforms and some exhibit small traces of the types of core platforms (e.g., cortical, striated, etc.). These variations in platform classification are discussed below when describing core-top debitage and proximal blade-core fragments. Only 334 complete blades were encountered and analyzed from Caracol and only 40 of these complete blades were utilized. The bulk of complete blades are not utilized at the macroscopic level. In contrast, fragmentary final-series blades in the collection are sections (e.g., proximal, medial, distal, or lateral). Medial sections account for 3,094 or 45.5% of the total final-series blades and about half of these (n=1,532 or 49.5%) are laterally or bilaterally used. Macroscopic edge-damage and retouch is present on 2,495 (or 36.7%) blades and blade segments. The pattern of edge-damage or use-wear on these blade segments and their archaeological context suggest blades were used as domestic, quotidian tools and either broken during use or were intentionally snapped and then used. Most of these blade segments are rectangular and exhibit slightly obtuse or right angle breaks. Some of these break types *do* indicate that blades were intentionally snapped to create shorter tools from long blades. These snap breaks are identical to those described by Hirth (2006:72) and would have created a 'bow tie-shaped fragment.' No bow-tie shaped fragments were recovered during excavations at Caracol, but the negative scars observed on blades fragments supports claims for the intentional snapping of obsidian final-series blades.

As stated above, the majority of blade segments were medial (n=3,094), but two other categories of blade segments are also of note in the collection. Proximal blades (n=1,340) segments, measuring 23.2 mm in length on average, and proximal/medial blades segments (n=809) measuring 33.7 mm on average appear to be important for tool use (Table 5-8). This is not surprising given that the proximal to medial portions of an obsidian blade has the most robust or thickest portions. The distal end of a blade on the other hand, although sharp, is thin and brittle.

Other blade artifacts included plunging or overshot pressure blades. These exhibit a distinct distal end. These production errors in blade removal are caused by excessive force that detaches part of the distal end of the blade-core (see also Hirth 2006:311; *plunging blade segments*). These kinds of blades are easily classified, even if the distal end of the blade is not present, because, unlike feather terminations on final-series blades, an overshot distal end becomes wider and thicker in contrast to being more narrow and thin. Although these may be classified as a production error, they could have been desirable as sources for tools (n=17). During the analysis of these plunging blades and later, during the analysis of exhausted blade-cores, these plunging blades appear to be one of the last attempts at blade removal before a blade-core was exhausted. This may be likely because of the small overall surface area of the pressure core platform and the difficulty in placing a pressure flaker at the ideal location and at the correct angle.

Table 5-8 also shows that objects were produced from final-series blades. These formed objects are listed under the *sub-type* in Table 5-8. Analysis of a single adornment fragment showed that the recycled blade fragment was drilled in the center. This object broke in half at this drilled location and only a lateral blade margin remains. The lateral edges of this reworked final-series blade were retouched to create a circular object. This object was termed an adornment because it may have been suspended by the drilled hole. Drills are those bilaterally retouch tools that have a distinct pointed or beaked end. *Drilled blades,* on the other, hand are those complete or nearly complete final-series blades that have a drilled hole in them. There were three of these in the collection and these have one to two small drill holes in one or both ends of the blade. This was likely done for suspension as all three come from two burials within the same structure (S.D.C3C-1, n=1; S.D.C3C-2, n=2). Eccentric blades also are retouched laterally like other adornments. This single eccentric blade is similar to other blades catalogued as notched blades. Some notched blades could have been termed eccentric blades, but efforts were made during cataloguing and analysis to simply record attributes rather than lump all shaped objects as eccentrics.

The bulk of blades show macroscopic use-wear and often lateral retouch. These were termed *edge-modified tools*. *Hafted tools* are those blade-tools with distinct bilateral notches that are directly opposite one another and may have been created to affix the blade to a shaft. Although further microscopic analysis is necessary, these kinds of composite tools may have been used in domestic crafting. Thirty-five other blades show evidence of intentional notching or were notched through excessive use. Investigations recovered some of these as broken fragments and therefore some of these could have been parts of hafted or composite tools but were discarded after breakage occurred.

Inlays are those small rounded medial blade fragments that could have been affixed to another surface. Not surprising, one of these came from a burial context (S.D.C29A-1). Other blades that are typically associated with ritual special deposits are often termed *lancets*. These final-series blades did not receive unique attribute analysis, but there are morphological differences exhibited from these blades. These blades are typically thinner than other wider final-series blades. These blades often have a triangular cross-section as opposed to a more trapezoidal cross-section common to final-series blades. This appears to be a result of removing these blades from the apex of the core platform were previous pressures blade scars converge. These blades are by far the most brittle when compared to other wider and robust final-series blades. Twenty-three of the 34 (67.6%) are complete and 32 (94.1%) come from special deposits (burials n=16; caches n=16). According to these data and contextual associations there may have been a clear craft production practice intended to remove these lancet blades, and these blades were specifically chosen for ritual activities.

Other final-series blades are miscellaneous blade fragments, the single overhang proximal blade-fragment that has a pronounced dorsally-lipped platform portion that may have been removed to regularize the pressure core platform, and lastly two small hafted points fashioned from retouched final-series blades. Figure 5-18 shows a sample of final-series blade artifacts. Figure 5-19 show a sample of retouched final-series blade objects.

Table 5-8. Type by attribute for final-series (3's) blades

Type by Attribute	Complete	Proximal	Proximal/ Medial	Lateral	Medial	Medial/ Distal	Distal	Plunging Complete	Plunging Distal	Plunging Medial	Plunging Medial/Distal	Total n=	%
N=	334	1,340	809	1	3,094	141	896	20	151	2	3	6,791	38.02
Avg. Max length (mm)	61.2	23.2	33.7	9.6	22.3	36.3	22.5	66.9	26.9	34.5	25.7		
Avg. Max width	11.1	11.9	11.4	10.9	10.7	10.1	10	19.7	11.7	15.6	9.4		
Avg. Max thickness	3	3.1	3.1	2.2	2.6	2.6	2.5	10.5	6.4	4.3	4		
Avg. Max weight (g)	2	1	1.5	0.2	0.8	1.3	0.6	13.8	1.8	2.9	1.1		
Avg. Min length	40.1	17.7	23.7		15.1	23.3	18.2	81.2	21.3	-			
Avg. Min width	8.6	9.7	10.2		9.4	8.7	8.2	9.7	9.7	-			
Avg. Min thickness	2.4	2.5	2.9		2.3	2.4	2.1	2.3	4.8	-			
Avg. Min weight	0.8	0.5	0.7		0.4	0.7	0.4	2.5	0.8	-			
Total weight (g)	456.2	1,213.5	1,103.9	0.2	2,155.7	175.2	491.6	266.4	228.2	5.8	3.4	6,100.1g	
Sub-type (n=)													
Adornment	-	-	-	1	-	-	-	-	-	-	-	1	
Bidirectional	-	-	-	-	1	-	-	-	-	-	-	1	
Blade	269	1,155	277	-	1,543	74	834	11	146	-	-	4,309	
Drill	2	-	-	-	2	1	1	-	-	-	-	6	
Drilled blade	2	-	1	-	-	-	-	-	-	-	-	3	
Eccentric blade	-	-	-	-	-	-	-	-	-	1	-	1	
Edge-modified	25	183	520	-	1,532	59	58	6	5	1	3	2,392	
Hafted tool	1	-	1	-	1	-	-	-	-	-	-	3	
Inlay	2	-	-	-	-	-	-	-	-	-	-	2	
Lancet	23	-	1	-	2	6	2	-	-	-	-	34	
Notched blade	9	-	12	-	11	1	1	1	-	-	-	35	
Single	3		10		22	1	n.d.*						
Repeated	6		2		10		n.d.*	2		1			
Other	-	-	-	-	2	-	-	2	-	-	-	4	
Overhang removal	-	1	-	-	-	-	-	-	-	-	-	1	
Point	1	1	-	-	-	-	-	-	-	-	-	2	

Table 5-8. Continued

Type by Attribute	Complete	Proximal	Proximal/ Medial	Lateral	Medial	Medial/ Distal	Distal	Plunging Complete	Plunging Distal	Plunging Medial	Plunging Medial/Distal	Total n=	%
Notch location (n=)												57	
Unilateral asym	-	-	1	-	3	1	-	-	-	-	-	5	
Unilateral sym	-	-	-	-	8	-	-	1	-	-	-	9	
Unilateral	2	-	8	-	14	-	-	-	-	-	-	24	
Bilateral asym	-	-	-	-	-	-	-	-	-	-	-		
Bilateral sym	-	-	1	-	1	-	-	-	-	-	-	2	
Bilateral	7	-	2	-	6	-	-	1	-	1	-	17	
Distal	-	-	-	-	-	-	-	-	-	-	-		
Avg. Notch width (mm)	7.2	-	5.7	-	4.2	3.6	-	9.1	-	10.3	-		
Avg. Notch depth (mm)	2.5	-	2	-	1.7	2.4	-	3.5	-	2.8	-		
Comments													

*n.d.= no data

Figure 5-18. Sample of final-series blades.

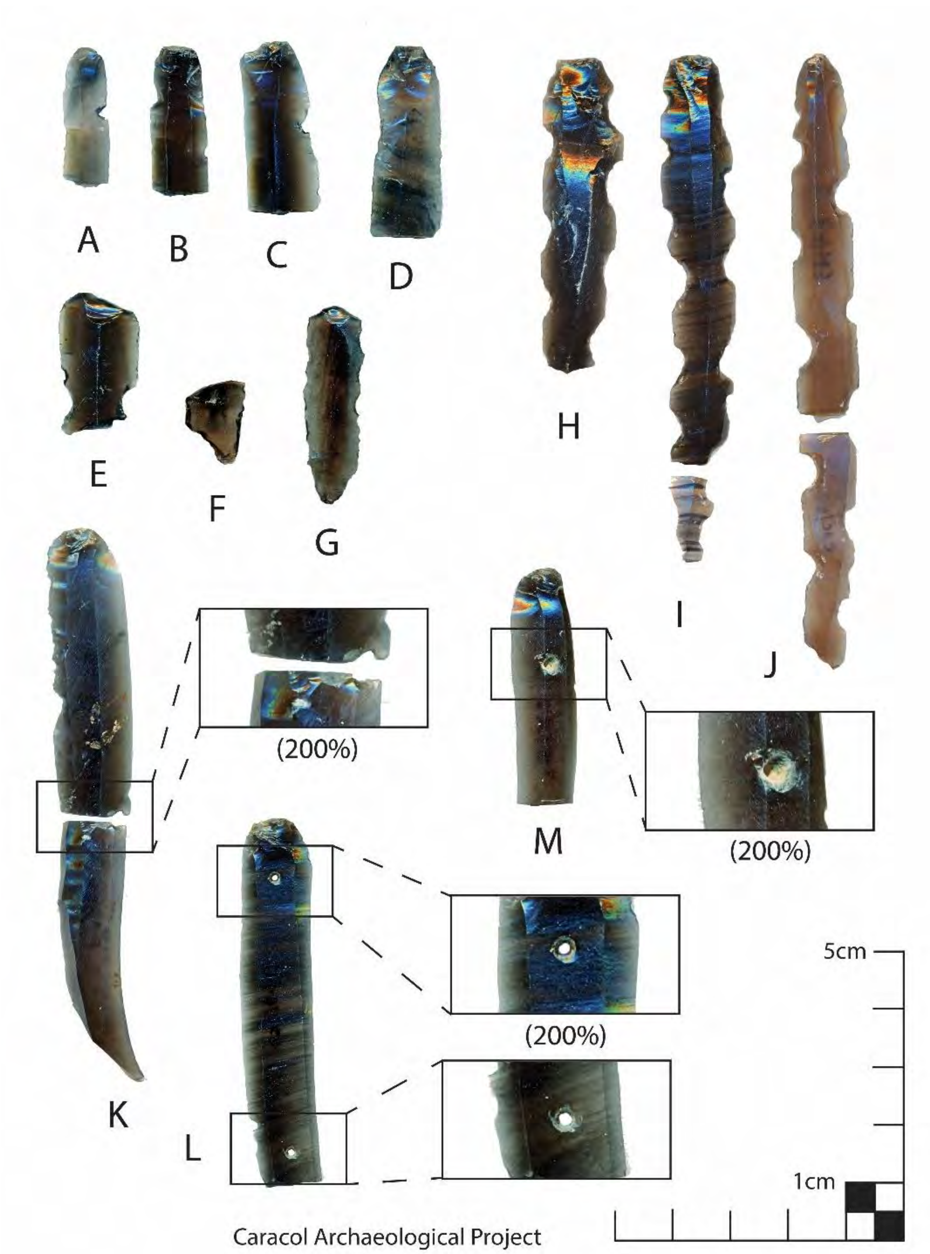


Figure 5-19. Laterally notched blades (A-C) C186D/6-14; utilized blade (D) C186D/8-25; hafted-tool with opposing bilateral notches (E) C186D/8-24; drill end (F) C186B/4-2a; complete drill (G) C193G/4-1; repeatedly and bilaterally notched blades (H-J) C3C/6-2a, SDC3C-2; drilled blades (K) C3C/6-3, SDC3C-2, (L) C3C/6-1a, SDC3C-2 (M) C3C/15-2a, SDC3C-1. Note inset boxes are 200% or double actual size to show drilled holes.

Contexts of final-series blades (3's): Final-series blades are recovered from nearly every investigation at Caracol. Of the total archaeological investigations at the site (n=209 Operations), approximately 90 percent of those (n=189) yielded obsidian.

This widespread distribution was also reported in D. Chase and A. Chase (2014). Both Table 5-9 and Figure 5-20 show the distribution of final-series blades by context and across the site area. Refuse/fill context account for 3,393 (49.9%) of final-series blade deposits and the majority (n=2,073, or 61%) of these are described as *edge-modified tools* and represent domestic tools found during archaeological investigations at residential structures throughout the sampled area at Caracol (p=90.5±1.21).

The second most significant contextual association is from investigations of human burial interments (n=3,155, or 46.4%). Of these burial investigations, 2,668 (84.5%) come from the three above tomb chamber deposits described earlier and these artifacts are listed in greater detail in Chapter 7. Although in far few amounts, final-series blades are commonly found in human burials excavated from residential settlements outside city center (p=90.1±4.5). Burials that do have blades often have one or more blades and just over a third of these (or 35%) are complete or nearly complete. Further analysis is necessary to quantify the actual average number of final-series blades found with human interments, but provided the high probability of expecting to recover these objects, the average number included with human internments may be unimportant in terms of making further interpretations.

Ritual caches also provide evidence for the inclusion of final-series blades. Over 62% of caches have final-series blades associated with them (p=62.3±10.36). Many of the blades are complete or nearly complete (n=132, or 54.3%; e.g., *complete, proximal/medial, medial/distal,* and *plunging complete*).

Table 5-9. Contexts of final-series (3's) blades by type.

Context/Assoc.	Complete	Proximal	Proximal/Medial	Lateral	Medial	Medial/Distal	Distal	Plunging Complete	Plunging Distal	Plunging Medial	Plunging Medial/Distal	Total n=	%	P=
Refuse/fill (n=)	26	345	639	1	2,097	90	178	1	14	-	2	3,393	49.96	90.5 ± 1.21
Adornment	-	-	-	1	-	-	-	-	-	-	-			
Blade	10	184	190	-	717	40	128	-	11	-	-			
Drill	-	-	-	-	2	1	1	-	-	-	-			
Edge-modified	12	160	439	-	1,367	47	48	-	3	-	2			
Hafted tool	1	-	1	-	1	-	-	-	-	-	-			
Inlay	1	-	-	-	-	-	-	-	-	-	-			
Lancet	1	-	-	-	-	1	-	-	-	-	-			
Notched blade	-	-	9	-	8	1	1	-	-	-	-			
Other	-	-	-	-	2	-	-	-	-	-	-			
Point	1	1	-	-	-	-	-	-	-	-	-			
Burial (n=)	269	981	111	-	917	33	711	3	129	-	1	3,155	46.45	90.1 ± 4.50*
Bidirectional	-	-	-	-	1	-	-	-	-	-	-			
Blade	237	963	56	-	783	21	702	3	128	-	-			
Drill	2	-	-	-	-	-	-	-	-	-	-			
Drilled blade	2	-	1	-	-	-	-	-	-	-	-			
Edge-modified	13	18	53	-	129	10	8	-	1	-	1			
Inlay	1	-	-	-	-	-	-	-	-	-	-			
Lancet	10	-	1	-	2	2	1	-	-	-	-			
Notched blade	4	-	-	-	2	-	-	-	-	-	-			
Cache (n=)	39	14	59	-	80	18	7	16	8	2	-	243	3.57	67.2 ± 10.04
Blade	22	8	31	-	43	13	4	8	7	-	-			
Eccentric blade	-	-	-	-	-	-	-	-	-	1	-			
Edge-modified	-	5	28	-	36	2	2	5	1	1	-			
Lancet	12	-	-	-	-	3	1	-	-	-	-			
Notched blade	5	-	-	-	1	-	-	1	-	-	-			
Other	-	-	-	-	-	-	-	2	-	-	-			
Overhang removal	-	1	-	-	-	-	-	-	-	-	-			
Total N=	334	1,340	809	1	3,094	141	896	20	151	2	3	6,791	38.02	

*Probability excluding three above tomb deposits.

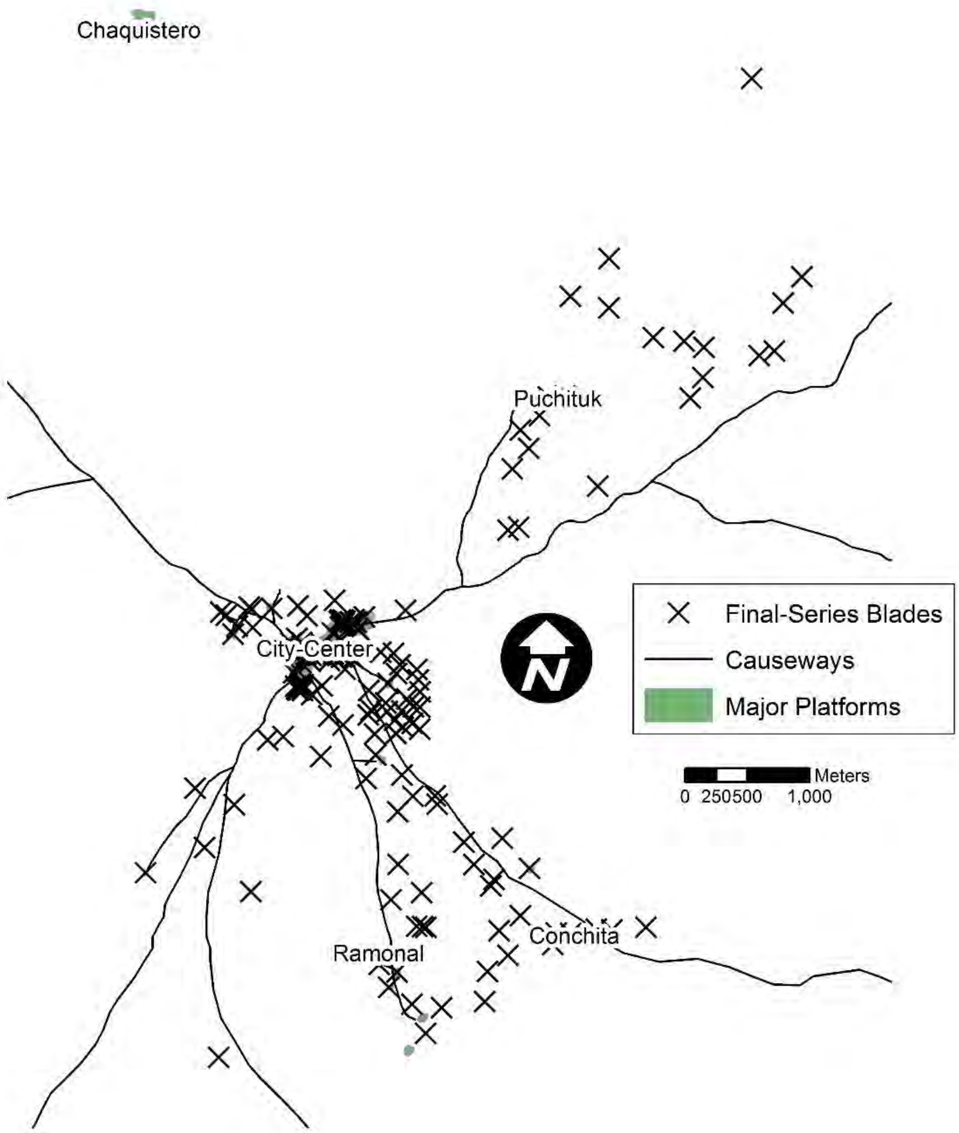


Figure 5-20. Distribution map of final-series blades (3's).

Other Blade Objects

Other blade objects are those artifacts that were not easily assigned into the initial- or final-series blades classifications. Table 5-10 shows that although most are complete or fragments, their general morphology did not allow a distinction between initial- or final-series. It is likely that a reanalysis of these artifacts may determine they are blade products from initial shaping of the core with pressure and/or indirect percussion reduction technique. Standard measurements were recorded for these artifacts, but no averages were provided in the below table due to the general diversity of these artifacts (but see Appendix G).

Table 5-10. Type by attribute of other blade objects or blade-production-by-products

Type by Attribute	Complete	Complete and Fragments	Medial	Medial/Distal	Totals	%
N=	5	24	3	1	33	0.18
Avg. Max length (mm)*	-	-	-	-		
Avg. Max width*	-	-	-	-		
Avg. Max thickness*	-	-	-	-		
Avg. Max weight (g)*	-	-	-	-		
Avg. Min length*	-	-	-	-		
Avg. Min width*	-	-	-	-		
Avg. Min thickness*	-	-	-	-		
Avg. Min weight*	-	-	-	-		
Total weight (g)	-	-	-	-		
					30.4g	
Sub-type (n=)						
Edge-modified	-	-	2	-	2	
Notched blade	1	-	1	-	2	
Flake	3	-	-	-	3	
Bipolar	-	-	-	1	1	
Blade	1	-	-	-	1	
Other	-	24	-	-	24	
Comments						

*Note: data not provided because different types have varied morphologies and data on averages is not applicable (see Appendices for measurements).

Contexts of other blade objects: The bulk of these "other" blade artifacts came from Operation C138C/4 (S.D.C138C-1) and it is likely that these were included in the fill matrix around and above the investigated tomb similar to the other larger deposits described earlier (Table 5-11). The presence of these kinds of artifacts in association with this kind of context may suggest a fourth burial tomb context like those from the city center (e.g., C12 and C87) and the Machete Group (C19). A reinvestigation of this context may encounter even more obsidian artifacts suggesting a redeposit of production material in association with a tomb or perhaps highlight potential residual traces of a production locale. It is important to note that these possible interpretations are discerned from brief descriptions of archived project records; however, these records do indicate a large portion of the tomb remains unexplored, especially the matrix above the tomb chamber. Only a portion of the tomb was explored to access the burial chamber through a collapsed and largely visible entrance.

Table 5-11. Contexts by type of other blade objects or blade-production-by-products

Context/Assoc.	Bipolar	Flake	Notched Blade	Edge-Modified	Blade	Other	Total	%	P=
Refuse/fill (n=)	1	1	-	2	-	-	4	12.12	0.1 ± 0.13
Burial (n=)	1	2	-	-	-	24	27	81.81	NA*
Indeterminate (n=)	-	-	2	-	-	-	2	6.06	NA
Total N=	2	3	2	2	-	24	33	0.18	

*Probability excluding three above tomb deposits. No artifacts found outside the three burial contexts.

Percussion Rejuvenation Techniques: Maintaining Core Bodies

All analyzed types of percussion rejuvenation debitage are presented first and then later the context of these is presented and mapped across Caracol's sampled residential settlement. While the vast majority do come from the three above tomb chamber deposits, others were recovered from caches and less so from household refuse and/or construction fills. Descriptions of rejuvenation debitage is organized from the proximal to distal in terms of where on a given blade-core they were removed.

Core-Top Debitage

Blade-core core-tops are morphologically distinct artifacts. The objects are generally round in plan-view if complete, and if incomplete, still retain lateral characteristics revealing negative blade removals on proximal, lateral, or distal margins. A core-top proximal margin is generally thick and usually has ground down or abraded ridges of its negative blade scars. This abrading helps to create a rough percussion sticking platform to remove the core-top. These core-top flakes were removed for at least two reasons. The first was to begin the rejuvenation process if the core became oblong and narrow at the proximal end. Removing this portion of the core would result in the core becoming shorter overall, but retrieve a greater width closer to the medial portion of the core. The second reason why these were removed is more difficult to demonstrate, but was likely to destroy the core. Removing this pressure platform from exhausted or nearly exhausted cores could function to disable further blade removal. The size of core-tops does not help to quantitatively tease out these potential differences as in both cases the top of the core would be small overall. Further analysis and a larger sample size may help to demonstrate core rejuvenation versus core destruction or termination. Analysis of many exhausted blade-cores, including those recovered from caches, does demonstrate that missing core-tops (as well as distal margins) is common.

Core-tops in the Caracol collection exhibit a wide range of attributes. Table 5-12 summarizes the range of types and average sizes by type. A total of 203 core-tops were recovered and analyzed from Caracol and a sample is shown in Figure 5-21. Most of these debitage pieces are unused after being removed exhibiting no macroscopic edge wear or retouch, but a portion of them do exhibit use or retouch. All core-top artifacts were measured length, width, and thickness, and also detail attribute analysis collected of edge-damage or retouch. Of the 203 core-top artifacts, cortical core-tops occurred with the highest percentage (n=50 or 24.6%). These cortical core-tops exhibit 100 dorsal cortex. A handful of exhausted blade-cores still retain cortical platforms. Because this cortical surface is so uniform, it may also be likely the surface was slightly ground. The next highest occurrence is that of faceted/striated core-tops (n=44 or 21.6%). These core-tops are defined by the numerous flake facets along with striations incised along the pressure platform margins on their dorsal surface. Following this type in amount are striated (n=40 or 19.7%) and faceted core-tops (n=39 or 19.2%). These two different types, although often overlapping do occur separately in near the same amounts. The least frequent clearly defined type is the pecked and ground core-top (n=23 or 11.3%). These have been recorded at Dos Hombres in the northern Belize (Trachman 2002). These can look very similar to cortical core-tops because the surface is very rough, but less uniform than if the platform was cortical. The last remaining core-tops (n=7 or 3.4%) were indeterminate because not enough of the original pressure platform exists. It is likely that these were removed directly after and opposite of a previous percussion removal of the majority of the core-top had occurred.

Regardless of core-top dorsal portion attributes, they were all about the same size overall (average of averages: length=24.6, *SD*=7.2; width=23.6, *SD*=5.8; thickness=9.6, *SD*=3.2). This is probably a function of when they were removed to rejuvenate or destroy a core's platform.

A last note about these core-top artifacts is that their diversity represented in Table 5-12 may be due to variation in blade-core pressure platform preparation as some have suggested (Hirth 2006; Trachman 2002). This diversity may also be a result of the changing strategies of platform preparation as cores were rejuvenated. In the latter scenario, cortical core-tops were the initial platform type and then as cortical core-tops were removed, other platforms were created such as, pecked, group, faceted, or striated. More research is planned to better explain variation in platform types among the Caracol obsidian assemblage.

Table 5-12. Summary data for core-tops from obsidian blade-cores.

Core-Top Debitage	n=	%	Avg. Length (mm)	Avg. Width	Avg. Thickness	Total Weight (g)	Avg. Weight (g)
Cortical core-top	1	0.33	19.8	12.0	12.6	3.4	3.4
Cortical core-top fragment	49	24.13	28.8	30.7	7.6	111.5	2.2
Faceted core-top fragment	39	19.21	33.5	28.0	8.7	116.4	2.9
Faceted/striated core-top fragment	44	21.67	29.4	27.7	7.1	81.2	1.8
Indeterminate core-top fragment	7	3.44	21.9	24.5	10.6	23.5	3.3
Pecked ground core-top fragment	23	11.33	28.4	24.6	4.6	61.9	2.6
Striated core-top	1	0.33	10.3	21.22	14.6	2.2	2.2
Striated core-top fragment	39	19.21	24.9	20.5	11.1	100.6	2.5
Totals/%	203	1.14	-	-	-	500.7	2.4

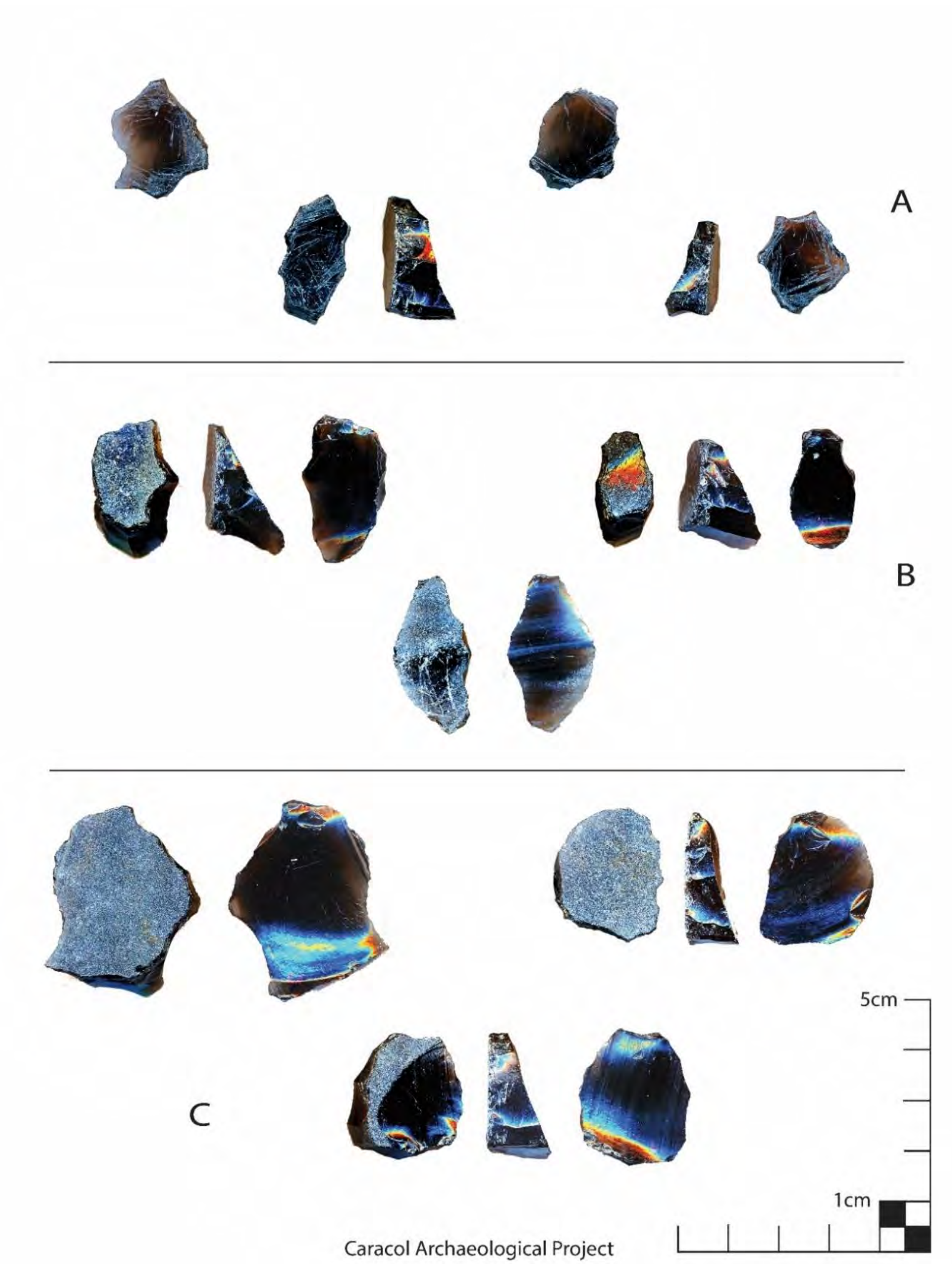


Figure 5-21. Sample of core-tops showing alternative dorsal/ventral/cross-sectional views in addition to the type of core-top. (A) C12A/47-1e, striated; (B) C12A/47-1f, pecked and ground; (C) C12A/47-1f, cortical.

Blade-Core Sections

Blade-core sections are very similar to platform preparation flakes (see below) with one distinct difference. Percussion or bipolar removal of these pieces extend across the entire width of a rejuvenated blade-core (see Hirth 2006:72; Figure 3.8b). Hirth in his reduction sequence has blade-core sections positioned prior to the removal of platform preparation flakes. This is entirely likely the case at Caracol as well, because some core-tops have remnant facets from platform preparation flake removal, while blade-core sections do not. Table 5-13 presents a brief description of these artifacts and Figure 5-22 shows a sample of these artifacts.

Table 5-13. Summary data for blade-core section rejuvenation debitage

Blade-Core Section Debitage	n=	%	Avg. Length (mm)	Avg. Width	Avg. Thickness	Total Weight (g)	Avg. Weight (g)
Bidirectional core section flake	1	1	31.3	30.2	8.18	5.7	5.7
Core section flake	99	99	28.8	24.9	7.7	317.17	3.2
Totals/%	100	0.56	-	-	-	322.87	3.2

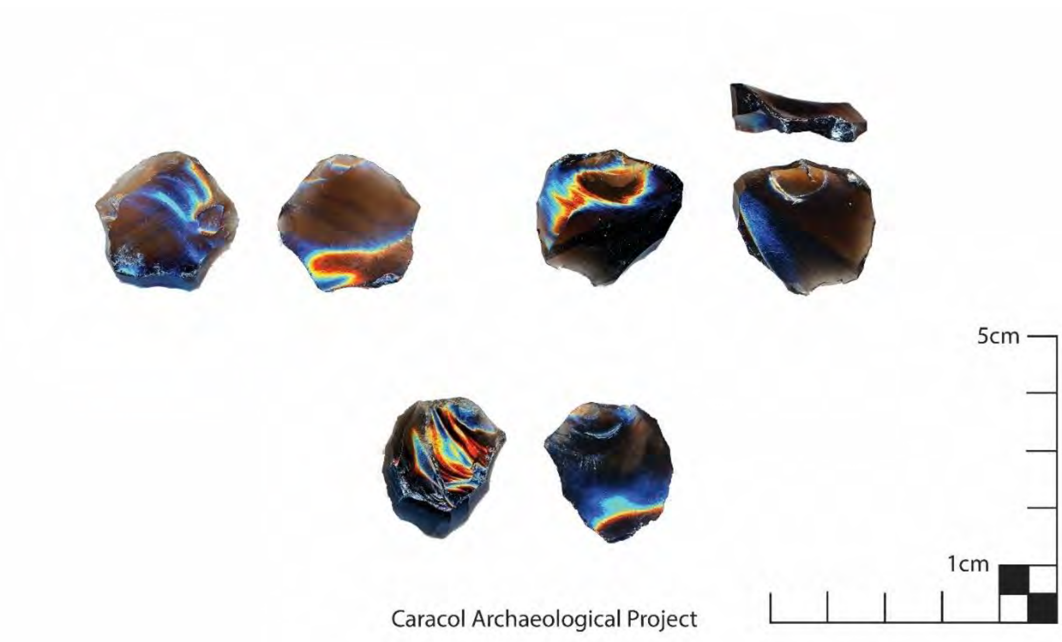


Figure 5-22. Sample of three blade-core sections. Dorsal surface left and ventral surface right. Top right core section flake shows cross-section.

Platform Preparation Debitage

Because blade-core rejuvenation was required to extend the production use-life of blade-cores, once core-tops and core sections were removed, subsequent flake removals were necessary to create a relatively flat surface which could then be striated, pecked, or ground (see core-tops). Many flakes may be removed to create this flat surface and the Caracol assemblage consists of almost 1,200 of these flakes (Table 5-14). These flakes are very distinct much like core-tops flakes (Figure 5-23). Platform preparation flakes are generally round and at least two lateral margins and the proximal end may include the negative blade-removal scars perpendicular to the direction of percussion that removed these flakes. Platform preparation flakes do not exhibit this blade-core remnant feature on their distal ends, as platform preparation flakes do not typically extend across the entire width of a blade-core (Hirth 2006:72; Figure 3.8c). Core-sections on the other hand do extend across the entire blade-core width (see above). Platform preparation proximal percussion striking platforms retained negative blade scars and many of the flakes exhibited abrading marks on negative blade scars. Abrading was performed to create a friction surface for a striking platform.

Table 5-14. Summary data for platform preparation rejuvenation debitage

Platform Preparation Debitage	n=	%	Avg. Length (mm)	Avg. Width	Avg. Thickness	Total Weight (g)	Avg. Weight (g)
Platform prep flake	1,193	6.68	24.9	22.1	5.0	1,595.65	1.33

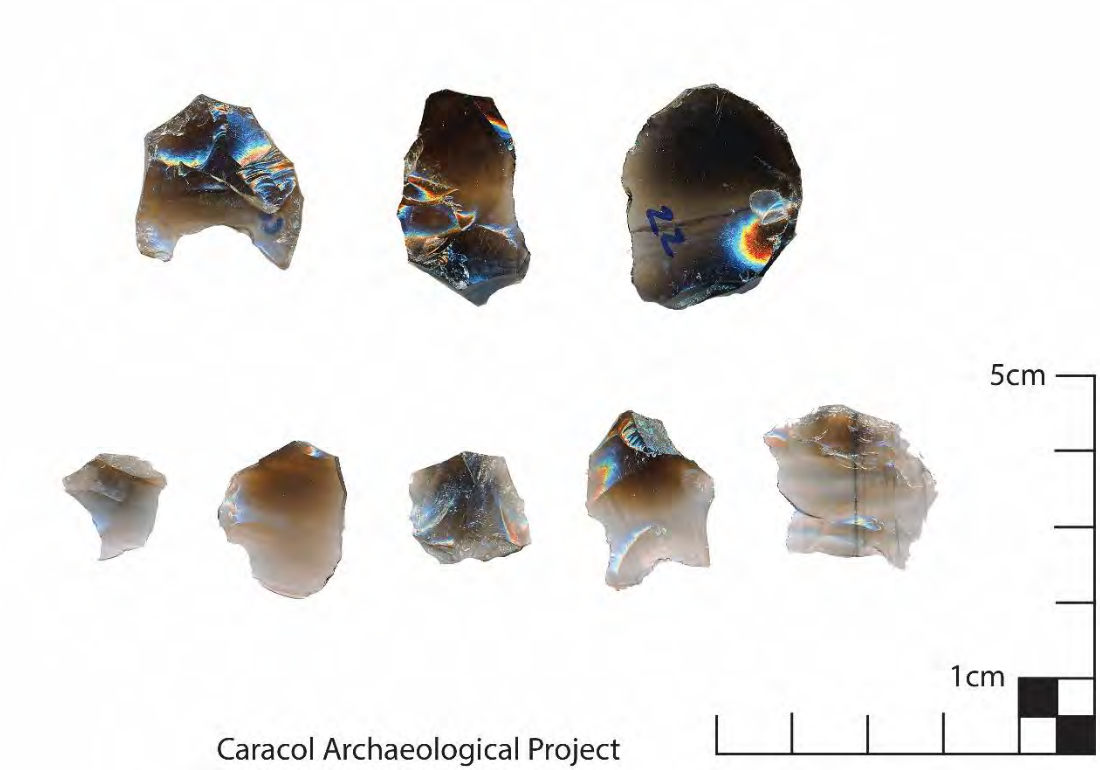


Figure 5-23. Sample of platform preparation debitage from C12A/47-1j. Ventral surface shown and striking platform is oriented upward.

Distal and Lateral Orientation/Rejuvenation

Due to overshots or other blade-production errors that affect the distal portion of a blade-core, there may be a need to rejuvenate or remove, and reorient, the distal portion. This reorientation relates to the desire to create continued uniformity of the core and to maximize the standard removal of blades from around the core's circumference. It may also be a strategy to maximize a core's utility to produce the maximum possible blades. Distal orientation debitage is also very distinct in morphology, but depending on how many dorsal scars are present and their direction, they can look very similar to smaller macro, core-shaping flakes or blades. Distal orientation debitage consists of a striking platform that is the distal end of the blade-core, which is usually ground or abraded. In other words, the proximal end of these types of debitage is pointed in that it is the actual distal end of the blade-core. The dorsal surface consists of two or more negative blade removal scars that were removed earlier in the opposite direction. This type of debitage is usually thin in width and the dorsal portion is domed proximal to distal (Table 5-15, Figure 5-24).

Lateral orientation or rejuvenation is necessary if a blade removal terminates prematurely, thus resulting in step or hinge terminations (see Hirth 2006:87-88, Figures 3.22 and 3.23). Lateral rejuvenations can occur for at least two reasons. Premature blade terminations can be removed by using indirection percussion at the point of the step termination on the core to continue to remove what would have been the distal end of the blade. The other method is to laterally strike the core to remove a larger portion of the core that includes the termination error. Some lateral core fragments which were cataloged as lateral rejuvenation did not have obvious errors on them, however. These could be from destroying cores by laterally striking them. A more detailed study of these artifacts might determine how these obsidian debitage fit into the broader reduction sequence, but they retain the general morphology of lateral rejuvenation debitage so they described as such, rather than creating an additional classification.

Table 5-15. Summary data for distal and lateral orientation/rejuvenation debitage

Distal/Lateral Orient/ Rejuv. Deb.	n=	%	Avg. Length (mm)	Avg. Width	Avg. Thickness	Total Weight (g)	Avg. Weight (g)
Distal orientation flake	482	81.42	34.8	19.0	7.4	1,168.3	2.4
Lateral core rejuv	110	18.58	27.7	22.7	4.9	113.2	1.02
Totals/%	592	3.31	-	-	-	1,281.88	2.16

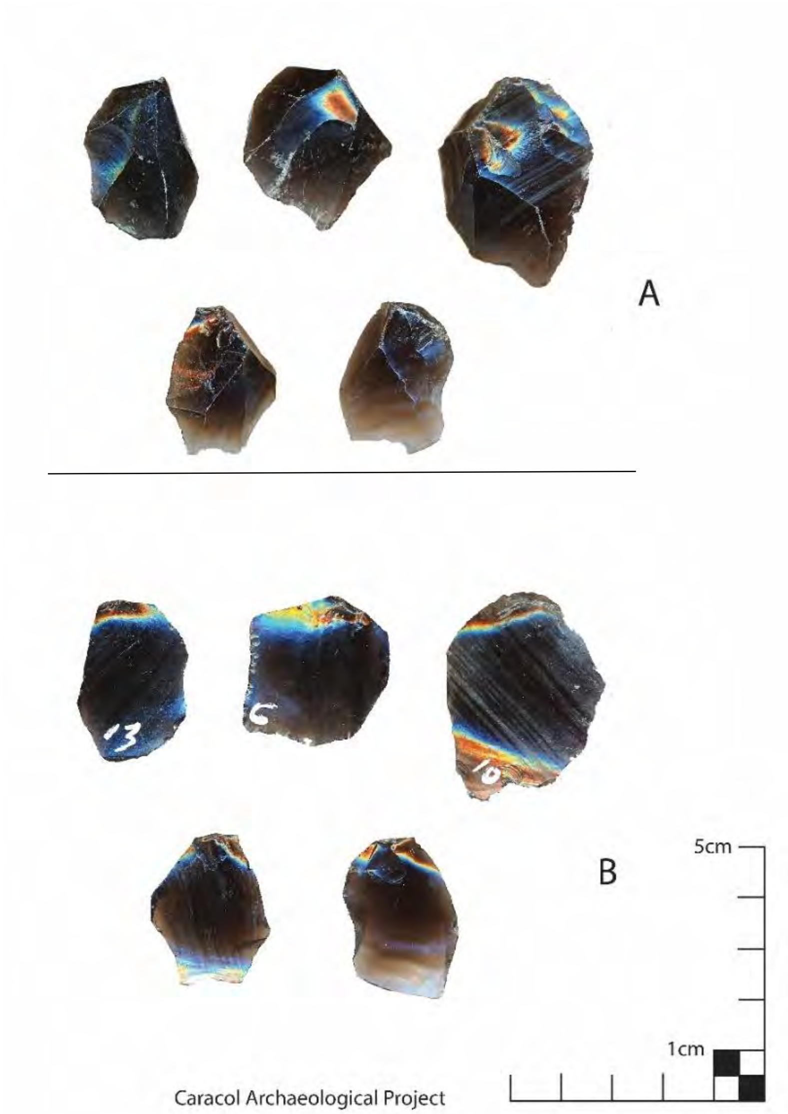


Figure 5-24. Sample of distal orientation rejuvenation debitage. (A) dorsal surface; (B) ventral surface.

Error Correction and Indeterminate Blade-Core Rejuvenation Debitage

These debitage types could not be confidently situated within the above types of rejuvenation debitage. Only one of these could have been produced while fixing an error in pressure blade removal; however, the other fifty of these artifacts were classified as indeterminate and do not retain sufficient diagnostic morphological attributes or features. Because of the small number of these artifacts (Table 5-16, Figure 5-25) it is unlikely that a reanalysis of these artifacts would significantly change the overall understanding in the organization of blade-core rejuvenation strategies.

Table 5-16. Summary data for other rejuvenation debitage.

Other Rejuvenation Debitage	n=	%	Total Weight (g)	Avg. Weight (g)
Indeterminate rejuv. Debitage	50	98.03	37.28	0.74
Error-correction	1	1.96	1.3	1.3
Totals/%	51	0.29	38.58	0.75

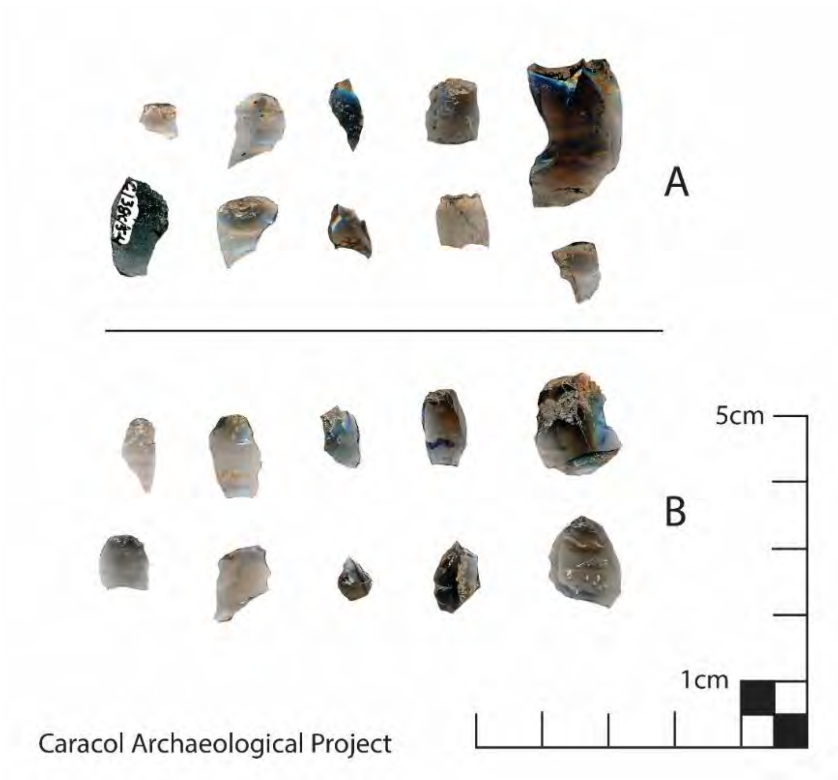


Figure 5-25. Sample of indeterminate blade-core rejuvenation debitage from (A) C138C/5-4 and (B) C138C/6-3.

Contexts of all core rejuvenation debitage: The distribution of rejuvenation debitage is much like that of blade-cores and blade-core fragments – wide spread both within and beyond the city center (Figure 5-26). The majority was recovered from the three above burial chamber deposits (n=2040, or 95.3%), while much smaller amounts were recovered from refuse/fill (n=55, or 2.5%) and cache deposits (n=44, or 2.0%). In terms of the burial chamber deposits, these most likely represent a redeposit of a significant portion of workshop debris (see Moholy-Nagy 1997, 2011, Trachman 2002).

With regard to the three large deposits associated with burial chambers, it is entirely likely that obsidian crafters at their workshops and through curating, collecting, and moving crafting evidence essentially erased archaeological evidence of the workshop.

The other contexts are most likely explained in part by the possibility that some amount of obsidian crafting or reduction was taking place at a given investigation. Future work would benefit from revisiting these groups that had rejuvenation debitage in refuse/fill contexts to determine if part of an obsidian workshop was partially excavated. As has been argued for chert workshops at Caracol, the total number of lithic artifacts greater than 100 is suggestive of an intensive workshop area and a detailed analysis usually shows a diversity of related reduction debitage (see Johnson 2008). Therefore, even if overall numbers of obsidian debitage is low for a particular refuse/fill context, the presence of these kinds of debitage and possibly tools should also be considered to infer a workshop area. These debitage can also be recycled into tools and then circulated to non-obsidian crafting households as retouched tools or other kinds of objects that elude current classification. Some of these tools may end up in refuse/fill contexts even if the probability of recovering these from refuse/fill is relatively low (n=55, $p=2.7 \pm 0.67$) (Table 5-17). These types of debitage are also present in caches (n=44, $p=21.3 \pm 8.75$) and likely represent intentional selection and inclusion of these in ritual caching practice; the same is argue for the three burial chamber deposits (n=2040) and from human burial interments excluding the three aforementioned larger deposits (n= 68, $p=6.6 \pm 3.74$). These contextual associations especially those from ritual contexts are explored further in Chapter 7 and are summarized later in this chapter (see Table 5-25).

Table 5-17. Contexts of blade-core rejuvenation by type.

Context/Assoc.	*Bidirectional core section flake*	*Core section flake*	*Cortical core-top*	*Cortical core-top frag*	*Distal orientation flake*	*Error-correction*	*Faceted core-top frag*	*Faceted/striated core-top frag*	*Indeterminate core-top frag*	*Indeterminate rejuv deb*	*Lateral core rejuv*	*Object from core rejuv deb*	*Pecked ground core-top frag*	*Platform prep flake*	*Striated core-top*	*Striated core-top frag*	*Total n=*	*%*	*P=*
Refuse/fill (n=)	0	5	1	0	7	1	0	0	1	10	2	0	1	25	1	1	55	2.57	2.7 ± 0.67
Complete	-	4	1	-	6	-	-	-	-	1	-	-	-	19	1	1			
Disk	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-			
Edge-modified	-	1	-	-	-	-	-	-	-	5	1	-	-	5	-	-			
Flake	-	-	-	-	-	-	-	-	-	4	1	-	-	-	-	-			
Fragment	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-			
Inlay	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-			
Notched, fragment	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-			
Scraper, notched, hafted	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-			
Burial (n=)	0	81	0	47	476	0	36	44	6	38	108	2	22	1,144	0	36	2,040	95.37	6.6 ± 3.74*
Complete	-	78	-	47	475	-	36	44	6	13	106	-	22	1,137	-	36			
Disk	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-			
Edge-modified	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-			
Fragment	-	-	-	-	-	-	-	-	-	25	1	-	-	-	-	-			
Ind. Rejuv. Debitage?	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-			
Inlay	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-			
Notched	-	1	-	-	1	-	-	-	-	-	-	-	-	1	-	-			
Other	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-			
Scraper	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

Table 5-17. Continued

Context/Assoc.	*Bidirectional core section flake*	*Core section flake*	*Cortical core-top*	*Cortical core-top frag*	*Distal orientation flake*	*Error-correction*	*Faceted core-top frag*	*Faceted/striated core-top frag*	*Indeterminate core-top frag*	*Indeterminate rejuv deb*	*Lateral core rejuv*	*Object from core rejuv deb*	*Pecked ground core-top frag*	*Platform prep flake*	*Striated core-top*	*Striated core-top frag*	*Total n=*	*%*	*P=*
Cache (n=)	1	14	0	2	0	0	3	0	0	2	0	3	0	17	0	2	44	2.05	21.3 ± 8.75
Complete	-	4	-	2	-	-	1	-	-	1	-	-	-	7	-	2			
Other	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-			
Notched	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-			
Edge-modified	-	2	-	-	-	-	1	-	-	1	-	1	-	3	-	-			
Fragment	-	8	-	-	-	-	-	-	-	-	-	-	-	3	-	-			
Notched	1	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-			
Notched core section	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-			
Total N=	1	100	1	49	483	1	39	44	7	50	110	5	23	1,186	1	39	2,139	11.97	

*Probability excluding three above tomb deposits.

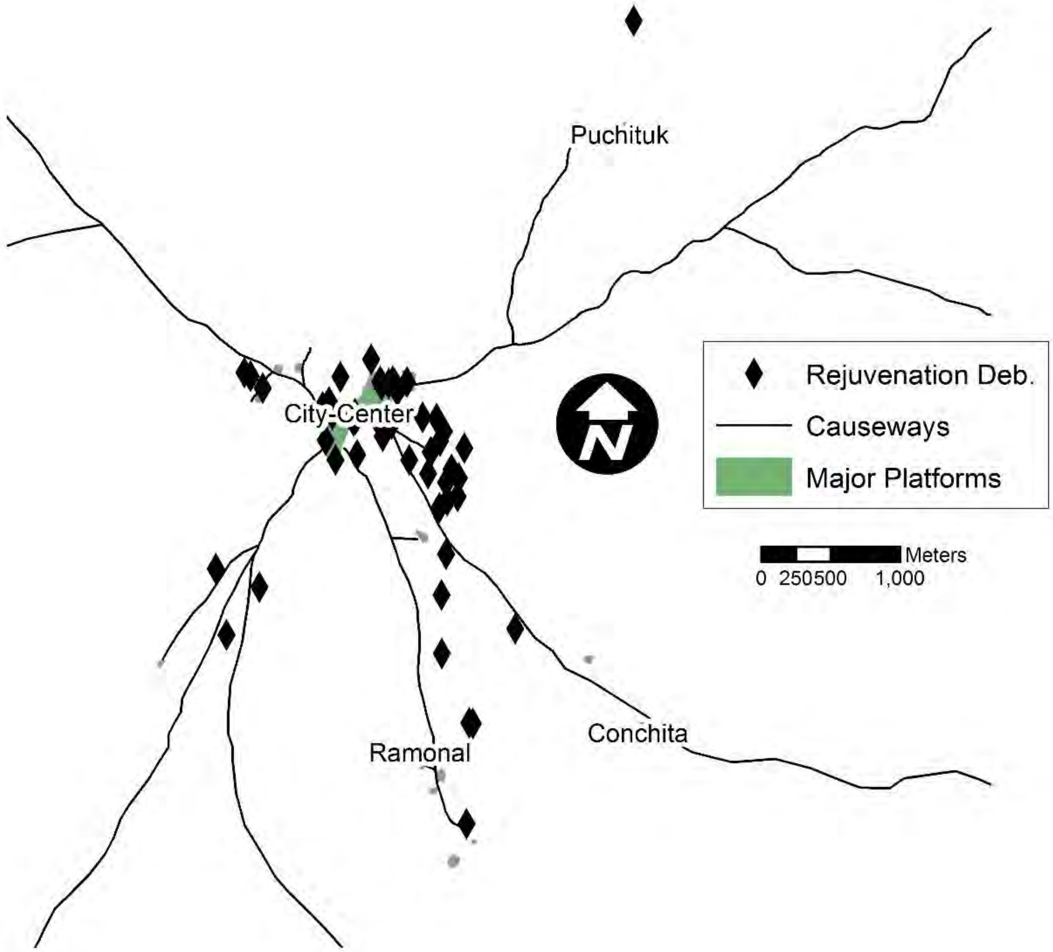


Figure 5-26. Distribution map of blade-core rejuvenation debitage.

Blade-Cores and Blade-Core Fragments

Obsidian polyhedral blades-cores are present in the Caracol collection. These artifacts are usually uniform in overall symmetry due to the way in which blades were removed by pressure technique as a core was rotated during blade removal. The technique that appears to have occurred at Caracol is similar to those recorded elsewhere in the Maya area (Hruby 2006; Trachman 2002). This technique is either hand held pressure and/or foot held pressure with a chest punch (see Flenniken and Hirth 2003; Pelegrin 2003; Titmus and Clark 2003). No experimental research was conducted during this project. The likelihood of similar techniques employed by local Caracol obsidian crafters is made by comparing the general similarities in exhausted core morphology, weight, and average morphometrics.

A standard set of analytical techniques were developed and adapted from other research to characterize these artifacts and treat each a unique object, hence they were catalogued individually (see Appendix I). Although these core objects show uniform qualities, the analysis scheme employed was designed to describe and quantity potential differences as well. Potential differences are relevant when these objects are situated within discussions of ritual behavior, rather than simply evidence for crafting for blade production. A goal of the research was to record crafting practices as well as additional intentional modifications of blade-cores that appears to relate to ritual associations (e.g., caches). Background research of obsidian lithic technology in the Maya area shows that blade-cores were a regularly ritualized objects and that many of these ritually used blade-core objects were termed eccentrics and are usually associated with some symbolic reference (Hruby 2006; Iannone 1993, Moholy-Nagy 1997, 2003).

As I will argue later (see Chapters 7 and 8), research interests of both the crafting and ritualization of blade-cores are intertwined. That said, the analysis scheme was designed to capture the final form of a blade-core recovered from the archaeological record and not necessarily record the reduction steps leading up to the finished form of an eccentric blade-core. Many of these observed reduction steps to make an ‘eccentric’ blade-core do not fit easily into an analysis scheme, so the comments fields in the blade-core table in Appendix I outlines many observations. For example, both complete and fragmented blade-cores are present in the collection and both may be ritualized. Some complete or near complete ‘eccentric’ blade-cores (e.g., those with missing platforms and/or distal portions) are exhausted cores where further blade removal is extremely difficult provided the small pressure platform and/or the presence of production errors that could not be fixed through rejuvenation. Complete blade-cores can also refer to finished objects or objects where further reduction occurred to create some type of other form. These forms could easily be term ‘eccentrics’ and already have a legacy in Maya scholarship. I avoid this term as much as possible in this discussion, because there is a need to understand the form prior to further transformation into an eccentric object. For example, a Caracol eccentric “E” is a common form or style recovered from ritual contexts. These are recovered at other sites as well (Hruby 2006; see also Iannone 1993:63, Figure 9; Moholy-Nagy 2003). Their form is dependent on the nature of the exhausted core and does not exist apart from it (see also Hruby 2007). Thus, a finished form or style, like that of an eccentric, may actually be a subjective classification if the analyst does not take the larger technological behavior into consideration. It also is contingent on the agency of people in the past to transform one thing into another. For example, cache deposits will be described that have a range of obsidian debitage and both worked and unworked exhausted blade-cores, therefore the term eccentric obscures what these objects really are within the broader understanding of the obsidian industry at a given site; some ‘eccentrics’ are simply unmodified blade-cores, while others may be notched blade-cores, and even others retouched or unretouched rejuvenation debitage.

Blade-cores account for 3.78% (n=742) of the total obsidian collection (n=19,592, or 4.15% of the total analyzed) (Table 5-18). These objects are complete or nearly complete, in various fragments (e.g., proximal, medial, distal, lateral), and are often crafted into other formed objects as stated above. These ‘other forms’ are simply labeled as “*Objects from*…” and account for 24.79% (n=184) of the core typology. Complete or near complete blade-cores make up 10.64% (n=79). Other counts and descriptions of blade-core fragments are provided in Table 5-18. Figure 5-27 shows a sample of exhausted blades cores and fragments.

Metric data for complete or near complete blade-cores are provided as well to demonstrate the similarity in average weight and overall size when compared to some sites from Mesoamerica. For example, Hirth (2006:67,73) at Xochicalco, Mexico describes the maximum and minimum length of 122 exhausted blade-cores as 88mm and 19mm respectfully, with an average length of 50.5 mm. Trachman (2002:113, Table 9.2) at Dos Hombres, Belize presents 11 complete exhausted blade-cores exhibiting a maximum and minimum length of 64.09 mm and 43.71 mm respectfully, and an average length of 50.5 mm. Caracol exhibits similarities in overall dimension of complete exhausted blade-cores (n=10) with an average maximum length slightly different (80.7mm) than those seen elsewhere and an average weight of 36.9 g. The length dimension of all *complete* blade-cores (n=79) shows a maximum and minimum length of 100 mm and 21.9 mm respectively, an average length of 66 mm, and, an average weight of 54.4 g. Table 5-18 also presents numerical and average weight data on blade-core fragments. Measurements of these artifacts are available in the online appendices tables (see Appendix A). A sample of these artifacts is presented in Figure 5-27. As Table 5-18 shows there was a directed effort to describe which parts of blade-core fragments were present in the collection. The goal behind this analysis scheme choice was to discover how, what are typically termed, ‘eccentrics’ are created and what parts of the cores were used or left over after their production. One interesting observation as a result of this type of analysis is that those artifacts labeled ‘*Objects from*…’ are also in multiple forms (i.e., medial/lateral core fragments) and so there is likely a subjective judgement call in some cases regarding what archaeologists actually think eccentrics to be. To be sure, there are forms that are intentionally created that look distinct (e.g., ‘E’ forms, ‘S’ forms) and that these forms were most often found in ritual contexts. But a pattern at Caracol is that not all blade-cores that have a style (i.e., ‘E’ or ‘S’) but were more generally intentionally destroyed (see Hirth 2006:78) were – more often than not – ritualized in caches or burials (see Table 5-22). Thus, there is a need to draw attention away from using the term ‘eccentric’ in favor of understanding the act of re-appropriating destroyed or retouch exhausted cores in general. The presence of refits in at least 11 of 31 (35.48%, see Chapter 8) caches and a 52.5%±10.68 probability of recovering blade-cores from ritual caches supports this argument. As stated earlier, many of these ritualized blade-cores were simply destroyed cores where their proximal, distal, and/or lateral margins were removed. In some cases, these cores were destroyed by placing them laterally on an anvil before being split (Hirth 2006:76, Figure 3.13). These acts of destruction will be described further below and in Chapter 7.

Table 5-18. Counts and total weights for blade-cores and blade-core fragments. Summary data for complete exhausted blade cores are also presented below.

Type	Bidirectional core	Bidirectional core frag	Blade-core frag	Exhausted core	Object from blade core frag	Objects from exhausted core	Total n=	%	Total Weight (g)	Avg. Weight (g)
Complete	6	-	3	10	13	47	79	10.64	4,298.05	54.4
Avg. Length (mm)	51.1	-	84.3	80.7	-	71.6				
Avg. Width	21.7	-	23.8	21.0	-	25.9				
Avg. Thickness	15.9	-	18.6	17.1	-	14.6				
Distal	-	7	37	3	2	1	50	6.73	412.09	8.2
Distal/lateral	-	-	44	1	6	2	53	7.14	414.04	7.8
Distal/medial	-	-	3	1	13	3	20	2.69	695.05	34.7
Flake	-	-	2	-	-	-	2	0.26	2.3	1.1
Indeterminate	-	2	69	-	1	-	72	9.7	149.6	2.07
Lateral	-	2	63	-	8	8	81	10.91	680.61	8.4
Medial	-	-	47	2	10	8	67	9.02	937.3	13.9
Medial/distal/lateral	-	-	1	-	2	-	3	0.4	34.3	11.4
Medial/lateral	-	1	142	5	19	8	175	23.58	1,178.7	6.7
Plunging	-	-	-	-	1	-	1	0.13	41	41
Prox/med/distal	-	-	3	-	-	3	6	0.8	447.8	74.6
Proximal	-	2	49	1	1	1	54	7.2	470.05	8.7
Proximal/lateral	-	-	43	-	8	3	54	7.2	461.4	8.5
Proximal/medial	-	2	4	2	7	2	17	2.29	431.1	25.3
Proximal/medial/lateral	-	-	1	-	6	1	8	1.0	81.9	10.2
Total N=	6	16	511	25	97	87	742	4.15	10,735.29	14.4

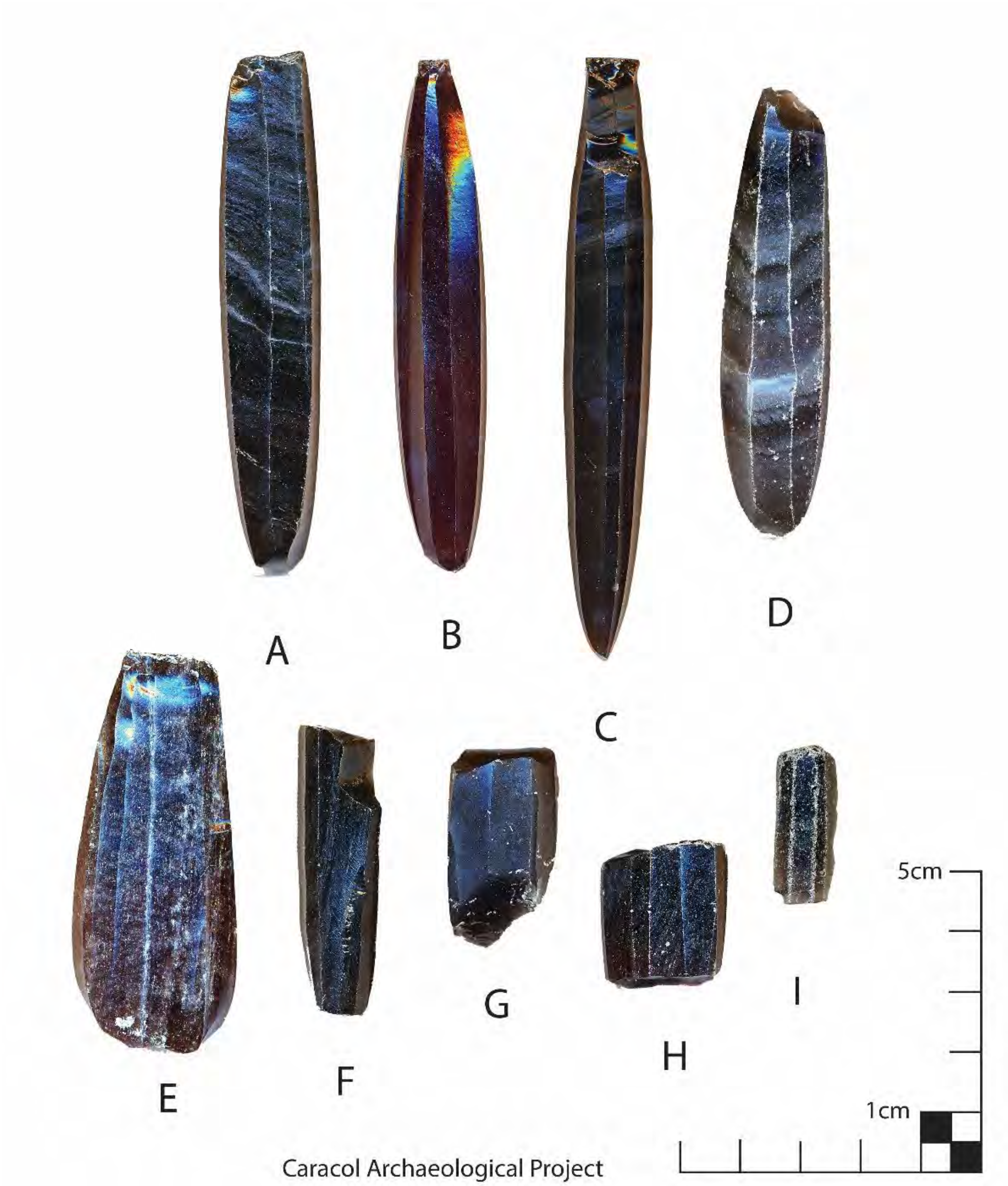


Figure 5-27. Sample of blade-cores and blade-core fragments. (A) C24D/1-4; (B) C189B/23-5; (C) C104B/1-1; (D) C188B/18-2; (E) C184B/30-3; (F) C51B/4-2; (G) C90B/15-1; (H) C189B/23-6; (I) C70B/ 45-1.

During sorting, cataloguing, and analysis it was apparent that exhausted blade-cores were intentionally destroyed and that the major method for destruction was to laterally notch a given core (e.g., bilaterally, unilaterally, medially, etc.). Because of this repeated observation, a blade-core analysis scheme was adapted to record at least one notch on these types of formed objects. In total 127 (or 17.1%) blade-cores exhibited notching. A list and analysis of the metrics and location of notching is shown in Table 5-19. Appendix I describes additional observations that are not provided in the below tables. It is important to note at the outset of this kind of description that the size of notching (i.e., general width and depth) is dependent on the overall size and shape of the exhausted blade-core being notched. Interpretations from general metrics and descriptive statistics should take this into account.

Table 5-19 shows the actual widths and depths of notching on various portions of blade-core fragments and objects from blade-cores. In hindsight, it is likely that the ten artifacts that exhibit notching as seen in Table 5-19, should have been catalogued as "*Objects from…*" as opposed to simply *blade-core fragments (non-rejuv)*. Notwithstanding, notching is an important attribute that occurred intentionally of these objects. The average width of all notched blade-core objects is 15.12 mm (*SD*=8.06 mm) and the average depth is 7.07 mm (*SD*=3.60 mm). The depth of the notch is restricted by the overall width of the exhausted blade-core, which results in less overall variation (Table 5-20). Other descriptive statistics calculated the coefficient of variation (*CoV* or *standard deviation* divided by the *mean* or *average* multiplied 100 [$CoV=\sigma/\mu$]) in notching practice to better understand actions on the part of either crafters or non-crafter to standardize notching morphology through percussion/pressure techniques. Table 5-21 shows that although there appears to be less variation in depth overall, both widths and depth exhibit very little variation suggesting directed efforts by those involved to regularize notching (Figure 5-28).

Table 5-19. Average notch widths (mm) and depths (mm) by notch type on blade-cores and blade-core fragments.

Notch Location	Blade-core fragment (non-rejuv)			Object from blade core frag			Object from exhausted core			Total n=	Total Avg of Width	Total Avg of Depth
	n=	Width	Depth	n=	Width	Depth	n=	Width	Depth			
Bilateral	1	17.48	3.00	17	14.42	4.63	17	14.97	6.55	34	14.46	5.42
Bilateral prox/distal	1	6.80	5.00	-	-	-	-	-	-	1	6.80	5.00
Bilateral/distal	-	-	-	1	22.07	8.17	-	-	-	1	22.07	8.17
Bilateral/distal/proximal	-	-	-	-	-	-	1	14.77	6.45	1	14.77	6.45
Bilaterally	-	-	-	2	14.08	5.79	-	-	-	2	14.08	5.79
Distal	-	-	-	8	17.00	9.92	-	-	-	8	17.00	9.92
Distal/proximal	-	-	-	1	0.00	0.00	-	-	-	1	0.00	0.00
Irregular	-	-	-	-	-	-	1	11.42	3.92	1	11.42	3.92
Lateral	-	-	-	2	12.56	12.19	3	22.12	11.49	5	18.30	11.77
Lateral medial	-	-	-	-	-	-	2	14.95	7.00	2	14.95	7.00
Lateral/ distal*	-	-	-	1	n.d.	n.d.	-	-	-	1	n.d.	n.d.
Medial	1	11.35	5.00	-	-	-	-	-	-	1	11.35	5.00
Multilateral	-	-	-	-	-	-	2	14.52	6.81	2	14.52	6.81
Proximal	1	11.76	4.00	-	-	-	4	9.99	2.75	4	10.97	3.00
Proximal/unilateral	-	-	-	-	-	-	1	16.27	9.14	1	16.27	9.14
Single unilateral	-	-	-	-	-	-	1	9.56	3.00	1	9.56	3.00
Unilateral	6	15.39	6.24	23	15.67	6.30	31	18.01	7.47	61	16.70	6.85
Total n=	10			55			63			127	15.12	7.07

*n.d.=no data

Table 5-20. Standard deviation (*SD*) for notch widths (mm) and depths (mm) by notch type on blade-cores and blade-core fragments.

Notch Location	Blade-core fragment (non-rejuv)			Object from blade core frag			Object from exhausted core					
	n=	Width	Depth	n=	Width	Depth	n=	Width	Depth	Total n=	Total STD of Width	Total STD of Depth
Bilateral	1	n/a*	n/a	17	8.00	2.42	17	8.00	2.48	34	7.90	2.63
Bilateral prox/distal	1	n/a	n/a	-	-	-	-	-	-	1	n/a	n/a
Bilateral/distal	-	-	-	1	n/a	n/a	-	-	-	1	n/a	n/a
Bilateral/distal/proximal	-	-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Bilaterally	-	-	-	2	1.19	1.22	-	-	-	2	1.19	1.22
Distal	-	-	-	8	4.79	8.21	-	-	-	8	4.79	8.21
Distal/proximal	-	-	-	1	n/a	n/a	-	-	-	1	n/a	n/a
Irregular	-	-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Lateral	-	-	-	2	6.17	0.52	3	1.76	3.03	5	6.20	2.19
Lateral medial	-	-	-	-	-	-	2	5.09	1.41	2	5.09	1.41
Lateral/ distal	-	-	-	1	n/a	n/a	-	-	-	1	n/a	n/a
Medial	1	n/a	n/a	-	-	-	-	-	-	1	n/a	n/a
Multilateral	-	-	-	-	-	-	2	4.29	4.88	2	4.29	4.88
Proximal	1	n/a	n/a	-	-	-	4	2.25	0.50	4	2.44	0.63
Proximal/unilateral	-	-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Single unilateral	-	-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Unilateral	6	2.44	2.12	23	7.61	3.61	31	8.41	3.40	61	7.75	3.38
Total n=	10			55			63			127	8.06	3.60

*n/a=not applicable

Table 5-21. Coefficient of variation (*CoV*) expressed as a percent (%) for notch widths (mm) and depths (mm) by notch type on blade-cores and blade-core fragments.

	Blade-core fragment (non-rejuv)			Object from blade core frag			Object from exhausted core					
Notch Location	n=	Width	Depth	n=	Width	Depth	n=	Width	Depth	Total n=	Total CoV of Width	Total CoV of Depth
Bilateral	1	n/a*	n/a	17	55.40	52.20	17	53.40	37.80	34	54.63	48.52
Bilateral prox/distal	1	n/a	n/a	-	-	-	-	-	-	1	n/a	n/a
Bilateral/distal	-	-		1	n/a	n/a	-	-	-	1	n/a	n/a
Bilateral/distal/proximal	-	-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Bilaterally	-	-	-	2	8.45	21.07	-	-	-	2	8.45	21.07
Distal	-	-	-	8	28.17	82.76	-	-	-	8	28.17	82.76
Distal/proximal	-	-	-	1	n/a	n/a	-	-	-	1	n/a	n/a
Irregular	-	-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Lateral	-	-	-	2	49.10	4.26	3	22.12	26.37	5	33.87	18.60
Lateral medial	-	-	-	-	-	-	2	34.04	20.14	2	34.04	20.14
Lateral/ distal	-	-	-	1	n/a	n/a	-	-	-	1	n/a	n/a
Medial	1	n/a	n/a	-	-	-	-	-	-	1	n/a	n/a
Multilateral		-	-	-	-	-	2	29.54	71.65	2	29.54	71.65
Proximal	1	n/a	n/a	-	-	-	4	22.52	18.18	4	22.52	18.18
Proximal/unilateral		-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Single unilateral		-	-	-	-	-	1	n/a	n/a	1	n/a	n/a
Unilateral	6	15.85	33.97	23	48.56	57.30	31	46.69	45.51	61	46.40	49.34
Total n=	10			55			63			127	15.60 %	37.90 %

*n/a=not applicable

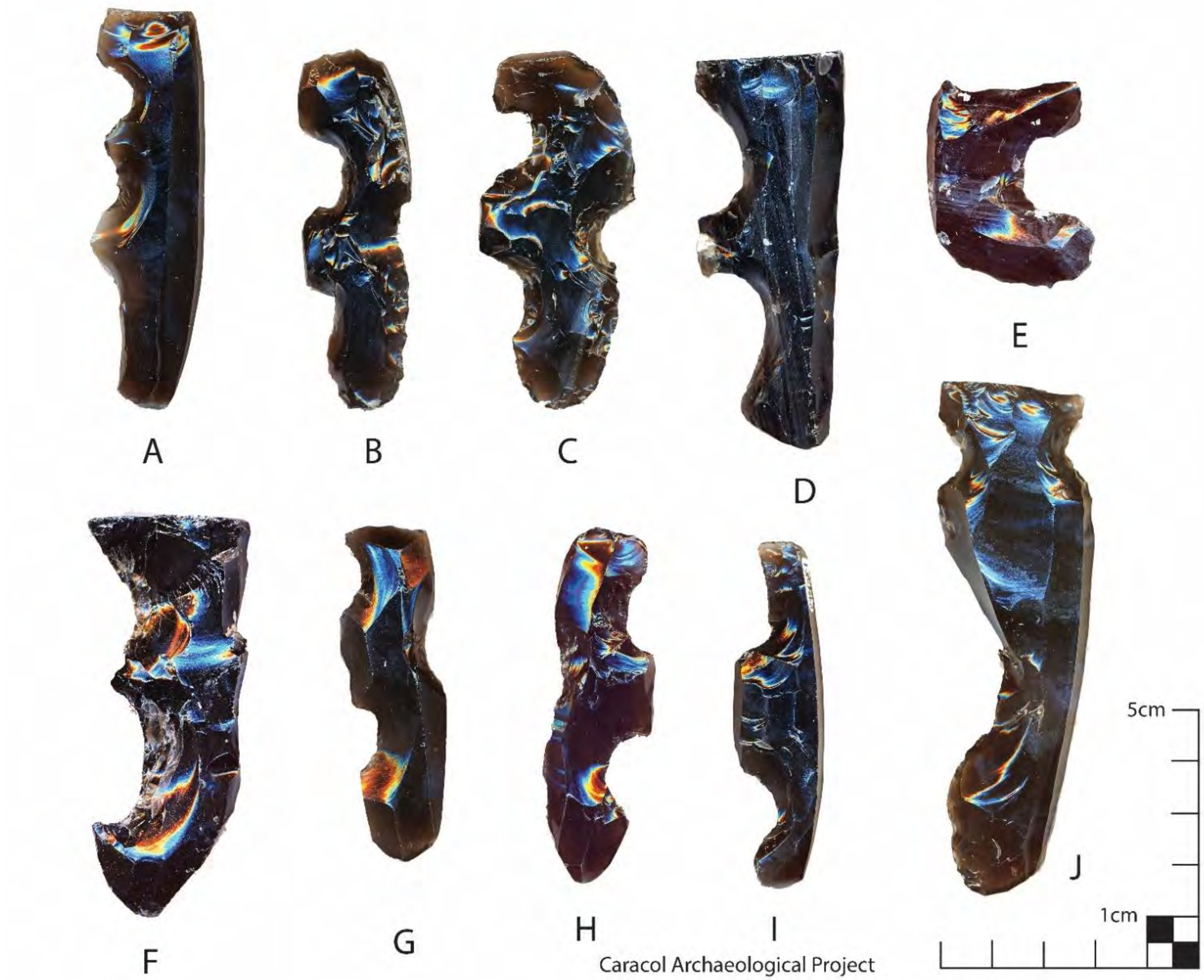


Figure 5-28. Sample of notched blade-core eccentric objects. (A) C177D/3-6; (B) C177D/3-7; (C) C177D/3-10; (D) C177D/46-21; (E) C85C/18-1; (F) C177D/42-16; (G) C4E/26-2d; (H) C4E/26-2c; (I) C4E/25-1; (J) C189B/3-1b.

Contexts of blade-cores and blade-core fragments: The distribution of blade-cores, blade-core fragments, and objects from blade-cores appears wide spread throughout the Caracol settlement; however, the majority of them were recovered during investigations within no more than 1km beyond the city's epicenter or city center (Figure 5-29). This is likely due to the greater intensity by the Caracol Archaeological Project to sample these residential areas. However, other excavations have taken place in a similar fashion beyond this 1km arbitrary limit and have also recovered blade-cores, thus suggesting that the distribution on these objects was possibly more wide spread if future investigations are undertaken far beyond the city center. This distribution, like other artifacts have shown (see above), suggests that an exchange mechanism was in place that aided in these objects moving far beyond crafting workshops. It also demonstrates that blade-cores had an intentional role to play within the materialization of residential ritual space. In addition, the distribution and contextual analysis suggests that there were efforts by obsidian crafters to curate and then distribute these objects to non-obsidian crafting households.

Furthermore, a contextual analysis demonstrates that there was a significant link or direct association with ritual practices at many residences. Blade-cores from cache deposits in particular accounts for 31.3% and although less overall in comparison to all burials (61.1%, p=5.8 ± 3.52), have a greater probability of being found (p=52.5 ± 10.68) (Table 5-22; see also D. Chase and A. Chase 1998:319). Other blade-cores have been recovered from non-ritual investigations (i.e., refuse/fill), but are not as likely to be recovered (p=3.2 ± 0.72). It is likely, however, that many of these blade-cores and fragments may have been left behind as the ancient Maya disturbed and possibly removed earlier cache deposits as they remodeled their residential eastern ritual structures (A. Chase and D. Chase 2007a).

Table 5-22. Contexts of blade-core and blade-core fragments by type and by context.

Context/Assoc.	Bidirectional core	Bidirectional core frag	Blade-core frag	Exhausted core	Object from blade core frag	Objects from exhausted core	Total n=	%	Total Weight (g)	P=
Refuse/fill (n=)	2	1	34	9	2	8	56	7.47	288.6	3.2 ± 0.72
Biface	-	-	-	-	-	1	1		23.8	
Complete	2	-	-	2	-	-	4		79.1	
Core section	-	-	2	-	-	-	2		7.9	
Distal	-	1	-	1	-	-	2		8.1	
Distal/lateral	-	-	2	-	-	1	3		5.8	
Edge-modified	-	-	1	-	2	2	5		11.4	
Indeterminate	-	-	4	-	-	-	4		7.2	
Lateral	-	-	3	-	-	1	4		18	
Lip plug	-	-	-	-	-	1	1		19.4	
Medial	-	-	4	2	-	-	6		27.7	
Medial/lateral	-	-	11	2	-	1	14		32	
Proximal	-	-	1	-	-	-	1		0.8	
Proximal/lateral	-	-	5	-	-	-	5		9.5	
Proximal/medial	-	-	1	2	-	-	3		36.6	
Uniface	-	-	-	-	-	1	1		1.3	
Burial (n=)	1	12	414	4	5	20	456	61.14	3,091.64	5.8 ± 3.52*
Complete	1	-	-	2	-	-	3		105.9	
Core section	-	10	348	-	-	1	359		2,271.84	
Distal	-	2	6	-	-	-	8		29.5	
Distal/lateral	-	-	1	2	-	-	3		15.9	
Eccentric	-	-	-	-	-	5	5		91.7	
Edge-modified	-	-	-	-	1	6	7		98	
Indeterminate	-	-	8	-	-	-	8		12.3	
Lateral	-	-	1	-	-	-	1		9.8	
Medial	-	-	6	-	-	-	6		65.8	
Medial/lateral	-	-	33	-	-	-	33		72.4	
Notched	-	-	-	-	4	5	9		191.8	
Other	-	-	3	-	-	2	5		55.6	
Proximal	-	-	1	-	-	-	1		11.6	

Table 5-22. Continued

Context/Assoc.	Bidirectional core	Bidirectional core frag	Blade-core frag	Exhausted core	Object from blade core frag	Objects from exhausted core	Total n=	%	Total Weight (g)	P=
Burial (n=) *(continued)*										
Proximal/lateral	-	-	6	-	-	-	6		16.8	
Proximal/medial	-	-	1	-	-	-	1		28.8	
Uniface	-	-	-	-	-	1	1		13.9	
Cache (n=)	3	3	62	12	90	60	230	31.37	7,355.45	52.5 ± 10.68
Biface	-	-	-	-	1	1	2		34.6	
Complete	3	-	1	6	-	-	10		378.6	
Distal	-	-	1	2	-	-	3		28.2	
Distal/lateral	-	-	6	-	-	-	6		46	
Distal/medial	-	-	1	-	-	-	1		24.8	
Eccentric	-	-	-	-	31	29	60		3,057.5	
Edge-modified	-	-	1	-	11	-	12		126.25	
Flake	-	-	2	-	-	-	2		7.45	
Indeterminate	-	-	1	-	-	-	1		1.2	
Lateral	-	-	1	-	1	-	2		8.4	
Medial	-	-	4	-	-	-	4		47	
Medial/distal/lateral	-	-	1	-	-	-	1		13.1	
Medial/lateral	-	1	10	3	2	1	17		129.3	
Notched	-	-	8	-	27	26	61		2,113.16	
Other	-	-	17	-	-	-	17		799.49	
Proximal	-	-	-	1	-	-	1		8.9	
Proximal/lateral	-	-	5	-	3	-	8		64.7	
Proximal/medial	-	2	2	-	-	-	4		124.4	
Proximal/medial/lateral	-	-	1	-	-	-	1		13.8	
Scorpion	-	-	-	-	-	1	1		29.3	
Scraper	-	-	-	-	2	-	2		18.6	
Uniface	-	-	-	-	12	2	14		280.7	
Total N=	6	16	510	25	97	88	742	4.14	10,735.69	

*Probability excluding three above tomb deposits.

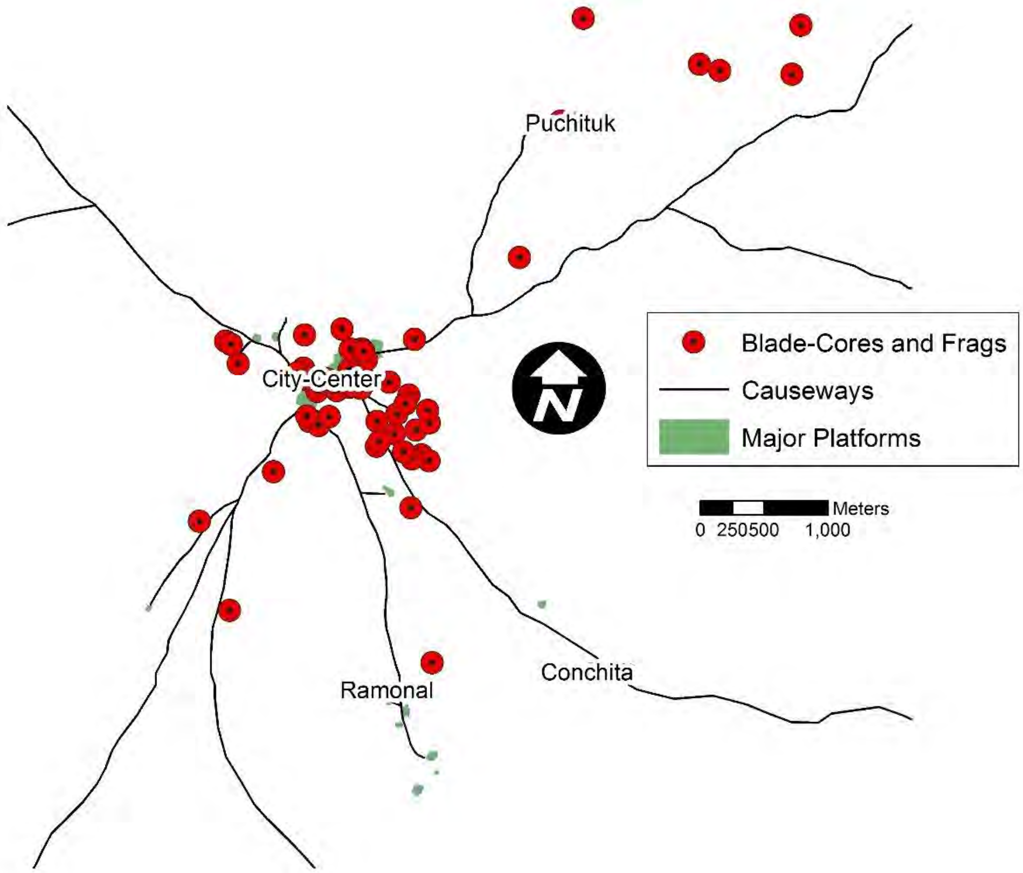


Figure 5-29. Distribution map of blade-cores and blade-core fragments.

Non-Blade Core Related Objects and Undiagnostics

Non-blade core objects are those artifacts that are not related to the production of pressure blades (Table 5-23). These included obsidian objects that cannot be linked through their general morphology to the blade production industry and include: (1) body adornments and inlays – those objects that were most likely part of bodily display or used to adorn another object; (2) bifaces and points – those bifacial objects that include a hafting element like a proximal stem and were not modified from blade-related debitage or blades; (3) general tools – those objects that have macro scale edge damage, modification, and/or retouch and are not blades; (4) flakes and flake fragments – those objects that are debitage not related to core shaping and maintenance, but may relate to the production or retouching of bifaces or projectile points; (5) chunks, shatter, and other undiagnostic debitage – those objects that are fragmentary pieces and do not have diagnostic morphological attributes; and (6) unmodified obsidian objects – those objects that are raw material, a nodule or pebble, or some other culturally unmodified material. Included in this last classification is only one unmodified artifact. This single small obsidian pebble was recovered from a cache and described in Chapter 4. It originated from the La Union obsidian source area in modern day Honduras.

Each general category of these non-blade-related and undiagnostic artifacts is described generally below. These objects comprise approximately 13% of the total obsidian assemblage. Because of the difficultly in effectively presenting all metrics per these kinds of artifacts, Appendices J and K offer detailed measurements on each and include comments when applicable. Table 5-23 presents non-blade-core related debitage and formed objects by context. Figure 5-30, Figure 5-31, and Figure 5-32 each show a sample of these artifacts and Figure 5-33 maps their distribution across the sampled Caracol settlement area.

Considering all three contexts it is unlikely that these kinds of artifacts will be recovered (e.g., refuse/fill, *p*=1.5±0.5; caches, *p*=1.6±7.92), but there is a slightly higher chance or probability that these will be recovered from burial contexts (*p*=4.1±2.99). In total, however, the majority were recovered from residential refuse and/or construction fill deposits. One burial in particular recovered six 'Stemmed-B Points" (Spence 1996) manufactured from Pachuca green obsidian (A. Chase and D. Chase 2011; Johnson et al. 2011). Metrics on four of these was recorded during this research project, while each was initially measure, weighed, and catalogued in the field lab directly after recovery (A. Chase and D. Chase 2010). Although these objects are described as *non-blade-core related objects,* a detailed study of these during the 2010 field season showed that these larger bifaces were probably manufactured on long green obsidian blades (Figure 5-31). A sufficient amount of ventral scaring on their proximal stems was still visible on these points to indicate that pressure flaking was likely the only reduction technique employed after these larger blades were removed from even larger blade-cores. There is no data presently available to indicate these points were made locally. Another similar point, although much smaller was recovered from a cache indicating that there were ritual uses of these objects in a caches as well as in a burial.

A total of 18 bifacial objects were studied as part of the analysis. Other points include two other green 'Stemmed-B Points' that were not available for further analysis and two other larger points recovered from a ceramic box cache from early excavations of a large stucco statue on the rear of structure A1 (A. Chase and D. Chase 1997, 2002)

Figure 5-32). A cursory analysis shows these artifacts are curved and therefore it is likely that these points may have also been fashioned from long obsidian blades, but further analysis is needed for confirmation. Figure 5-32 also shows a set of obsidian ear flares with a ceramic backing recovered from an Early Classic tomb burial in the Southern Acropolis (S.D.C88C-7).

Lastly, undiagnostic obsidian artifacts are listed by context in Table 5-24. These objects comprise about 13 percent (or n=2,314) of the total analyzed obsidian collection. By reviewing their contextual associations, it is just as likely to find objects such as these in any of the three broad contextual typologies (Refuse/fill, $p=13.6 \pm 1.41$; Burials, $p=19.8 \pm 6.01$; Caches, $p=16.4 \pm 7.92$). Again, metric analysis of these artifacts is provided in Appendix K. Although non-blade-core related artifacts were mapped (Figure 5-33), undiagnostic objects were not.

Table 5-23. Types by context for non-blade-core related debitage and formed objects.

Context/Assoc./Type	Biface	Edge-modified flake	Flake	Pebble	Point	Pressure flake	Scraper	Total n=	%	Total Weight (g)	P=
Refuse/fill (n=)	3	0	29	0	8	1	1	42	7.77	97.55	1.5 ± 0.50
Biface	-	-	-	-	7	-	-	7		56.8	
Complete	-	-	-	-	1	-	-	1			
Distal	-	-	-	-	2	-	-	2			
Medial	-	-	-	-	3	-	-	3			
Proximal portion	-	-	-	-	1	-	-	1			
Biface fragment?	-	-	1	-	-	-	-	1		0.9	
Proximal	-	-	1	-	-	-	-	1			
Biface thinning	-	-	23	-	-	-	-	23		4.4	
Complete/frags	-	-	23	-	-	-	-	8			
Complete and frags	-	-	15	-	-	-	-	15		7.25	
Complete	-	-	3	-	-	1	-	4			
Distal	-	-	-	-	-	-	1	1		8	
Edge modified	-	-	1	-	-	-	-	1		2.1	
Complete	-		1					1			
Medial	1	-	1	-	1	-	-	3		14.7	
Point	1	-	-	-	-	-	-	1		0.4	
Distal	1	-	-	-	-	-	-	1			
Proximal	1	-	-	-	-	-	-	1		3	
Burial (n=)	0	0	1	0	6	0	0	7	12.96	146.1	4.1 ± 2.99*
Biface	-	-	-	-	1	-	-	1		8.5	
Proximal	-	-		-	1	-	-	1			
Bipointed tool?	-	-	-	-	1	-	-	1		2.9	
Complete	-	-	1	-	-	-	-	1		0.5	
Larger Stemmed-B Point	-	-	-	-	4**	-	-	4		*134.2	
Cache (n=)	0	2	1	1	1	0	0	5	9.25	85.3	3.2 ± 3.76
Pebble	-	-	-	1	-	-	-	1		3.1	
Complete	-	-	1	-	-	-	-	1		0.2	
Eccentric	-	2	-	-	-	-	-	2		71.8	
Smaller Stemmed-B Point?	-	-	-	-	1	-	-	1		10.2	
Complete	-	-	-	-	1	-	-	1			
Total N=	3	2	31	1	15	1	1	54	0.3	328.95	

*Probability excluding three above tomb deposits; **A total 6 were recovered; only 4 were available for analysis.

Figure 5-30. Obsidian pebble. C118F/24-3.

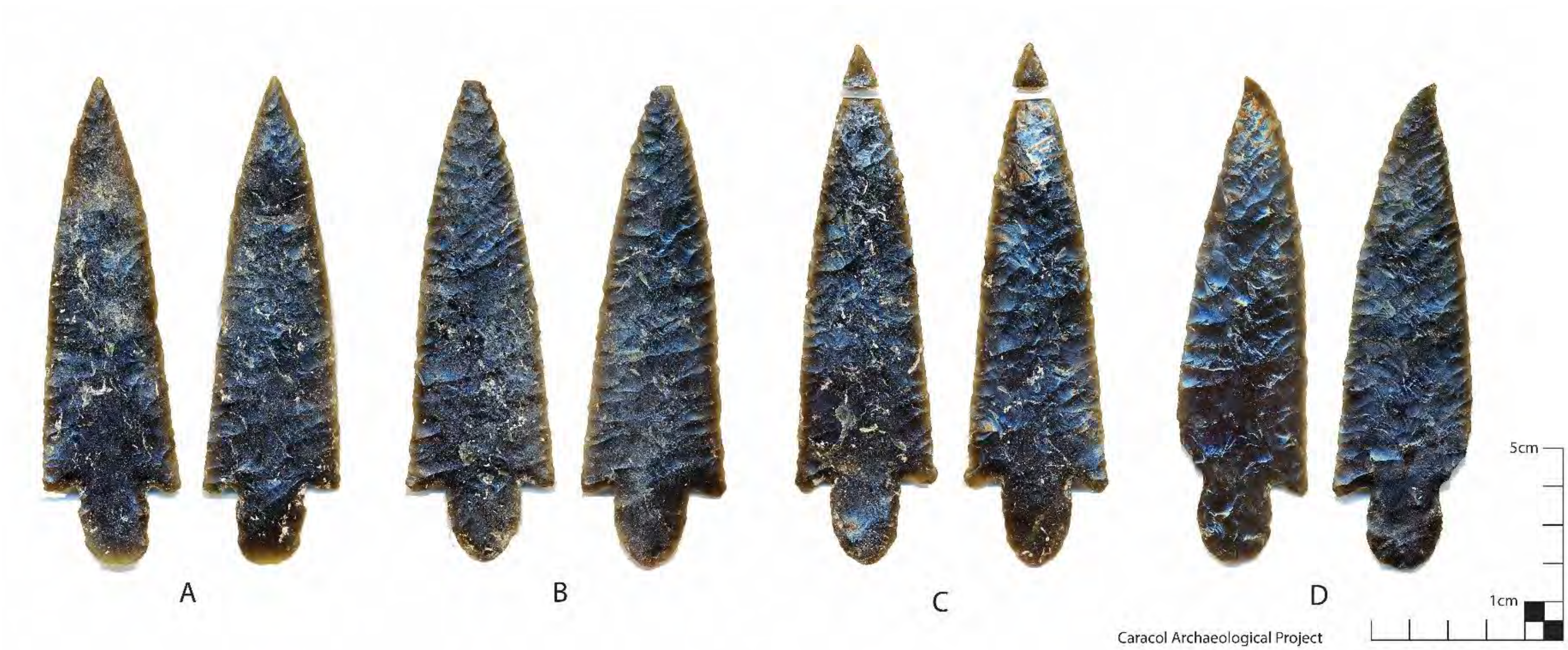


Figure 5-31. Sample of green ‘Stemmed-B Points”. (A) C117F/8-24; (B) C117F/8-25; (C) C117F/8-26; (D) C117F/8-27.

A

B

Figure 5-32. (A) Two obsidian bifacial points within a ceramic box with lid deposited with jadeite artifacts (SDC141C-2). Ceramic box and artifacts placed inside the chest area of a large stucco human statue within Structure A1. (B) Set of obsidian ear flares with ceramic backings from SDC88C-7. Used by permission from the Caracol Archaeological Project.

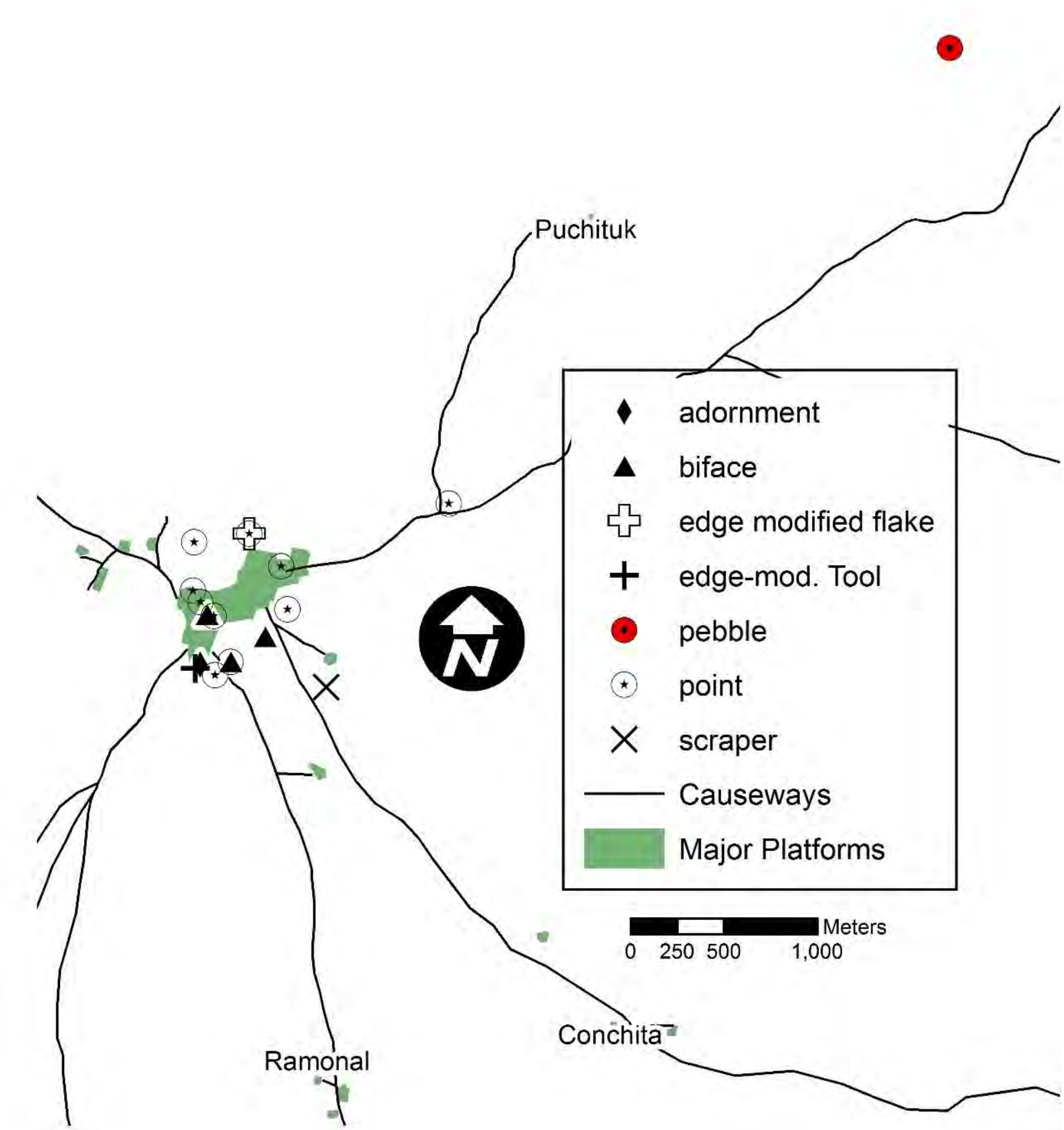


Figure 5-33. Distribution map of non-blade-core related objects.

Table 5-24. Undiagnostic objects by context.

Context/Assoc./Type	Adornment	Blade frag?	Chunk	Edge-mod. Tool	Flake	Flake fragment	Flake fragments	Flakes	Fragment	Inlay	Lateral core frag?	Shatter	Various debitage	Total n=	%	Total Weight (g)	P=
Refuse/fill (n=)	0	2	4	1	45	1	0	6	216	1	0	12	2	290	12.61	154.65	13.6 ± 1.41
-	-	-	3	1	31	1	-	6	183	-	-	12	2	239		100.05	
Biface?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		1.2	
Blade-core frag?	-	1	1	-	2	-	-	-	10	-	-	-	-	14		12.7	
Drill?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		0.3	
Edge-mod	-	1	-	-	1	-	-	-	9	-	-	-	-	11		15.2	
Edge-mod blade?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		1.6	
Edge-mod tool	-	-	-	-	1	-	-	-	-	-	-	-	-	1		1.8	
Edge-mod?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		2.5	
Flake	-	-	-	-	-	-	-	-	1	-	-	-	-	1		0.9	
Fragment	-	-	-	-	4	-	-	-	-	-	-	-	-	4		2.1	
Ground flake?	-	-	-	-	-	-	-	-	-	1	-	-	-	1		0.4	
Macro flake?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		1.5	
Macro?	-	-	-	-	1	-	-	-	-	-	-	-	-	1		3.7	
Macroblade?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		1.5	
Macroflake frag?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		1	
Notched	-	-	-	-	-	-	-	-	1	-	-	-	-	1		2.8	
Platform prep?	-	-	-	-	4	-	-	-	1	-	-	-	-	5		2.1	
Pointed flake tool	-	-	-	-	1	-	-	-	-	-	-	-	-	1		0.9	
Pointed tool	-	-	-	-	-	-	-	-	1	-	-	-	-	1		0.2	
Rejuv debitage?	-	-	-	-	-	-	-	-	1	-	-	-	-	1		0.5	
Various	-	-	-	-	-	-	-	-	2	-	-	-	-	2		1.7	

Table 5-24. Continued

Context/Assoc./Type	Adornment	Blade frag?	Chunk	Edge-mod. Tool	Flake	Flake fragment	Flake fragments	Flakes	Fragment	Inlay	Lateral core frag?	Shatter	Various debitage	Total n=	%	Total Weight (g)	P=
Burial (n=)	2	0	2	0	6	0	5	0	174	0	0	1	1825	2,015	87.03	754	19.8 ± 6.01*
-	-		2	-	2	-	5	-	165	-	-	1	1825	2,000		717.55	
Blade frags?	-	-	-	-	-	-	-	-	3	-	-	-	-	3		0.6	
Blade-core frag?	-	-	-	-	1	-	-	-	1	-	-	-	-	2		1.6	
Ear flare	2	-	-	-	-	-	-	-	-	-	-	-	-	2		29	
Edge-mod	-	-	-	-	1	-	-	-	1	-	-	-	-	2		3.3	
Platform prep?	-	-	-	-	2	-	-	-	3	-	-	-	-	5		1.1	
Possible blade	-	-	-	-	-	-	-	-	1	-	-	-	-	1		0.85	
Cache (n=)	0	0	0	0	2	0	0	0	5	0	1	1	0	9	0.34	6.31	16.4 ± 7.92
-	-	-	-	-	2	-	-	-	2	-	1	1	-	6		2.91	
Edge-mod	-	-	-	-	-	-	-	-	3	-	-	-	-	3		3.4	
Total N=	2	2	6	1	53	1	5	6	395	1	1	14	1,827	2,314	12.93	914.96	

*Probability excluding three above tomb deposits

Organization of Obsidian Crafting at Caracol: Summaries and Interpretations

From the above data (n=17,868) and contextual associations (e.g., refuse and/or construction fill, burial, and cache) a series of observations and interpretations can be stated. These interpretations enable a model of obsidian blade production and debris management to emerge from Caracol for the first time. It is important to note here that more research can be performed on the Caracol obsidian collection if more time was available, but that the artifact analysis included above and in Appendices F-K demonstrates a significant first step to better situate Caracol within established models of obsidian craft production, including how crafters figure within the larger socioeconomics of ancient Maya household reproduction.

As stated above, this research follows an idealized linear reduction sequence (see Hirth and Andrews 2002:3, Figure 1), but also includes contextual associations to better historicize the distribution of artifacts and how/why workshop debitage and other debris was managed. In other words, some research inferred the general nature of obsidian reduction from particular contexts (Demarest et al. 2014; Olson 1994; Trachman 2002, 2006); but a main concern of the current research is to not only infer the nature of obsidian reduction techniques and practices by crafters, or power of elites, but to also infer, through the analysis of contexts, how artifacts moved about and how workshops were potentially managed. Workshop management by crafts people is extremely important in obsidian reduction. Volcanic glass is dangerous and therefore directed efforts were most certainly made to remove both products (e.g., blades) and waste (e.g., debitage and cores) from areas common to human locomotion. Moholy-Nagy (1997, 2013) asserts that larger obsidian dumps in association with at least two of

Tikal's city center tombs functioned to remove this dangerous debris from household workshops. To be sure, these dumps would have fulfilled this function, but why these locations, why were eccentrics included (Moholy-Nagy 2013:36) and why in such a direct ritual juxtaposition? These phenomena are also present at Dos Hombres (Trachman 2002) and numerous other Classic period sites (see Moholy-Nagy 1997). Another large deposit is in association with a stela at Cancuen (Demarest et al. 2014). If analysts define "eccentrics" as *any* re-appropriated or recycled obsidian object – not just those notched or in a particular style – then each context where waste occurs could be associated with a ritualized behavior. Lending further support, eccentric blade-cores, or other core-shaping-debitage, were also commonly associated with caches, and their nature of production is most certainly linked to ritual behavior (Hruby 2007).

In order to explore these broader – more social – components of an obsidian industry, I explore the contexts for each broad type of classification presented earlier. Obsidian analysis is more often than not concerned with the production of blades as goods or commodities and then research follows these blades to consumers exploring local economics. But to what extent would we understand other internal social relations if we followed the itinerary of both *blades* and *non-blade objects* as they exited workshops? Although this section discusses the organization of production, I do introduce a summary of contexts where obsidian is often recovered. This contextual analysis will be explored in greater detail in later chapters. A discussion of the actual kinds of potential exchange mechanisms (e.g., markets, non-markets) that help to explain distributions will be explored in Chapter 6. A summary table of technological stage and type by its probability of occurrence in one of the three contextual associations is shown below (Table 5-25) and this table is also converted into probability plots (Figure 5-34).

Table 5-25. Summary of technological stages and type by contexts with percentages found per sampled context (p=0.05).

	Refuse/fill (sampled=1,584)		Burials (sampled=121)		Caches (sampled=61)	
Technological Stage/Type	present	p=	Present*	p=**	present	p=
Macro core shaping	26	1.6 ± 0.51	3 (6)	2.5 ± 2.35	17	27.9 ± 9.59
Percussion debitage	7	0.4 ± 0.26	2 (5)	1.7 ± 1.95	3	4.9 ± 4.61
Initial series blades	83	5.2 ± 0.91	10 (13)	8.3 ± 4.16	8	13.1 ± 7.21
Final series blades	1,434	90.5 ± 1.21	109 (112)	90.1 ± 4.50	41	67.2 ± 10.04
Other blades	2	0.1 ± 0.13	0 (1)	0.0 ± 0.0	0	-
Rejuvenation debitage	42	2.7 ± 0.67	8 (11)	6.6 ± 3.74	13	21.3 ± 8.75
Blade-cores and blade-core frags	51	3.2 ± 0.72	7 (10)	5.8 ± 3.52	31	52.5 ± 10.68
Non-blade-core related objects	24	1.5 ± 0.50	5 (6)	4.1 ± 2.99	2	3.2 ± 3.76
Undiagnostics	215	13.6 ± 1.41	24 (27)	19.8 ± 6.01	10	16.4 ± 7.92

*Number in parenthesis is occurrences from all 124 human burial contexts;
**Probability calculated not including the three above tomb burial contexts.

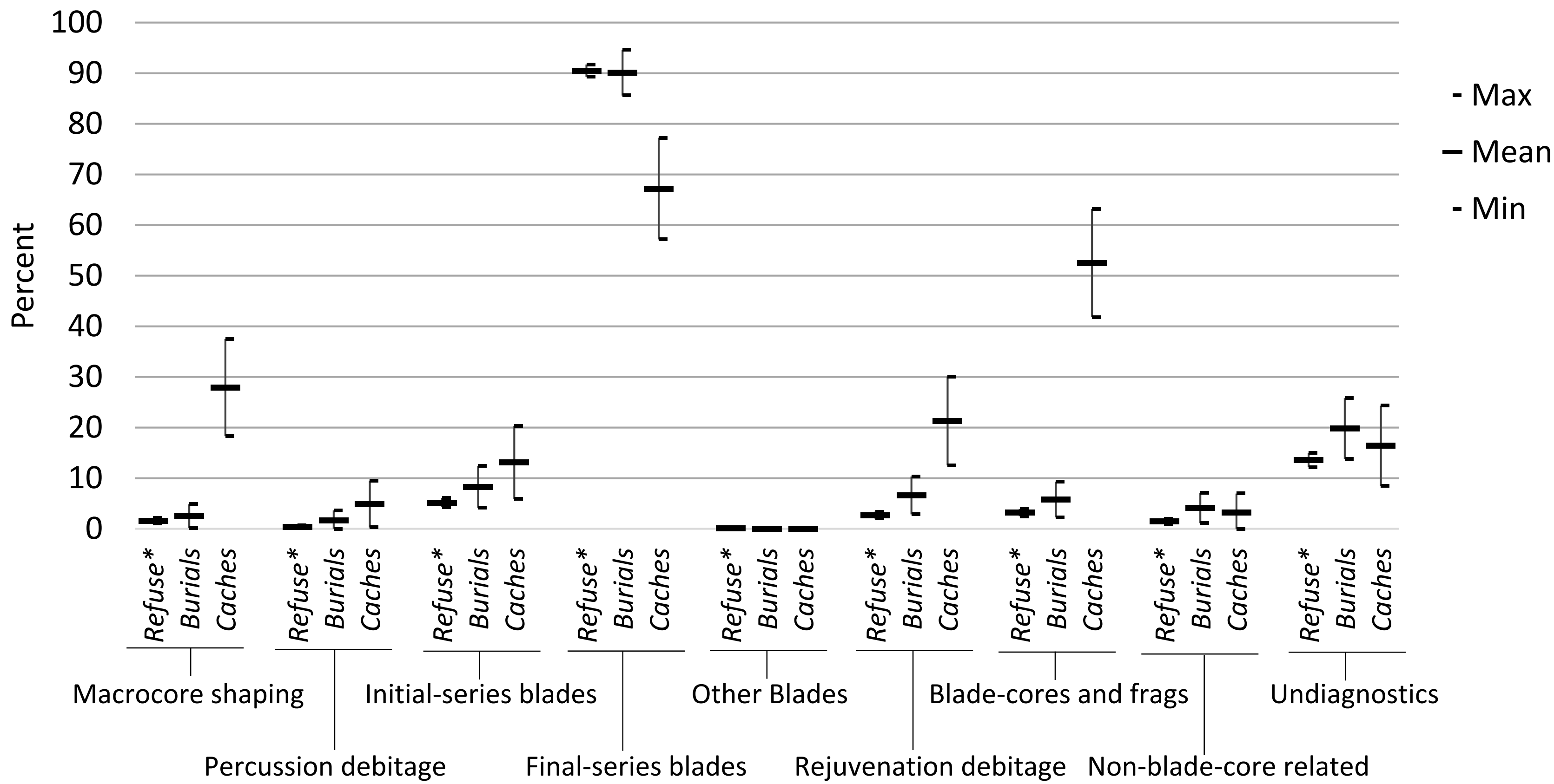


Figure 5-34. Summary probability plot (*p=0.05*) for each major artifact type by context. Sample size for Refuse/fill context is 1,584. Sample size for Burials is 121 and excludes three above tomb chamber deposits. Sample size for Caches is 61. *Refuse in figure listed referes to "*refuse/construction fill*" contexts.

Initial percussion technique on some sources of obsidian (El Chayal and Ixtepeque) was performed by striking roughed-out macrocores to create a *core preform* or *primary macro core*. By referring to Table 4-2 the only macrocore shaping debitage that exhibited cortex came from the El Chayal obsidian source. Other macro-debitage is present, however, from the Ixtepeque source and therefore it is likely that roughed-out prepared primary macrocores were imported into Caracol, and that these did not contain cortical surfaces. No other sources are known to have entered Caracol in the form of macrocores. In fact, according to the sourcing data, no other core material from any other source other than El Chayal and Ixtepeque entered Caracol. Based on an overall impression of percussion debitage and exhausted core length, macrocores were not very larger, perhaps 20-30cm in length. More research and a greater sample size of percussion core shaping debitage is required to further refine this estimate.

El Chayal was by far the most abundant source material followed by a fraction of Ixtepeque (see Chapter 4). Regardless of the quantity, both El Chayal and Ixtepeque cores were being shaped locally at Caracol. In further support, smaller percussion debitage which is a byproduct of polyhedral core shaping is also present in high amounts. The presence of both of these data furthers suggest the reduction of macrocores occurred at local workshops.

Debitage from the reduction of cores were managed at workshops. Evidence for this interpretation is garnered from the contextual analysis of percussion debitage. By far the highest amount of this debitage type came from obsidian dumps in association with city center tombs and these would have been moved from workshop locales after it was internally managed by crafters. Although these dumps exhibit a significant amount of these debitage types, caches show a much greater probability for recovering macro core-shaping debitage in comparison to both burials and refuse/fill deposits (Figure 5-34). This probability with regard to macro core-shaping debitage in particular suggests that at the very least, crafters were managing this debitage in sufficient numbers to then provide other household residences with these for domestic rituals. This same assertion is repeated for other types of obsidian debitage. Small percussion flakes, on the other hand, do not show up with the kinds of counts, but when they are present at Caracol, they come from one specific eastern structure excavation (C184B).

Pressure technique on blade-cores to shape the cores into polyhedral cores for blade removal certainly took place locally. This technique involved intentional unidirectional knapping to create a circular blade-core for the further removal of final-series pressure blades.

In terms of the overall reduction and shaping of blade cores, not every stage other lithic analysists have reported is seen in the Caracol assemblage. What appears to have occurred is that after the core was shaped by percussion and indirect percussion, initial-series blades were removed. These blades exhibit irregular dorsal flake scars and often have percussion attributes on their dorsal surfaces and pressure attributes ventrally. Some of these blades, however, could have been removed by indirect percussion as well. The result, however was the same – a uniform pressure core. Removal of final-series blades then occurred and according to the counts and archaeological contexts, this blade type was the most desired.

The occurrence of finding pressure blades in refuse and/or construction fills has become an expected phenomenon at Caracol (D. Chase and A. Chase 2014). Initial-series blades comprised only a small handful of these pressure blades in comparison to final-series blades. Final-series blades were recovered from nearly every context with statistical significance (Figure 5-34). The blades are commonly found during residential investigations as well as during excavations of human burials and less so from caches. Final-series blades appear to be the only obsidian artifact type that was used in all of these ways for a variety of purposed. It is important to note that the majority of complete final-series blades (n=68, or 76.4%) came from burials and therefore suggests the intentional act of procuring or curating, and using complete blades for this purpose.

After blade-cores are initially exhauted from the removal of final-series blades percussion techniques were applied to rejvenate cores. The resulting rejuvenation debitage shows evidence of direct or indirct percussion technique. Hirth (2006:72-78, Figure 3.8) outlines and illustrates a reconstruction of blade-core rejuvenation techniques used in Xochicalco, Mexico. Although a different cultural group, the techniques reconstructed at Caracol fit well into this well-established schematic. A range of rejuvenation debitage is present in the Caracol collection (Table 5-17). Exactly 78% of these are distal orientation (n=483) and platform preparation flakes (n=1,186). This shows more effort was directed to create platforms and maintain distal core symmetry. A significant amount of core sections as well as core-tops were also present in the collection. The diversity of core-tops or core platform types (Table 5-12) demonstrates a range of practices to create a stable pressure platform. Many of the core-tops exhibit cortical platforms, while others are striated, faceted, or otherwise modified. Core sections were also included in this category if they were similar to platform preparation flakes, crossed the entire width of the blade-core, and therefore have negative pressure blade scars on all margins. Unlike the *blade-core sections (non-rejuv)* classification, core-sections were relatively thin and not blocky. These blockier sections were recorded as medial blade-core fragments that were most likely produced from intentional core destruction. Due to the presence of substantial amounts and diversity of rejuvenation debitage, it appears that there was a substantial labor and time investment to maximize the productivity of blade-cores (see Trachman 2002).

Like other debitage, the majority of rejuvenation debitage, when combined, was recovered in various amounts from three burial chambers within the city center; however, the likelihood of these being included in other non-city center burials are unlikely and even less likely from investigations of household refuse and construction fills. Caches exhibit a significantly higher probability, but not as significant as macro core-shaping or exhausted blade-cores and blade-core fragments. Cache deposits specifically have included various types of rejuvenation debitage: core section (n=14), cortical core-tops (n=2), faceted core-tops (n=3), shaped objects (n=3), striated core-tops (n=2), indeterminate rejuvenation debitage (n=2), and finally platform preparation flakes (n=17). Again, the presence of these debitage types – from a specific kind of reduction, during an important step in maintaining the usefulness of a blade-core – shows a concerted effort by crafters to maintain or curate these debitage pieces before circulating them to non-obsidian-crafting residences.

Blade-cores are complex objects for lithic analysis and a complete summary of these artifacts is beyond the scope of this summary. Important elements to summarize are as follows. A total of twenty-two bidirectional blade-cores – either whole or fragmented – were recovered, just over half of which from large tomb deposits (n=12, or

54.5). Analysis of these objects showed that only one to two blades were removed from the distal end of cores and that these were removed after the distal portion of the core was removed. This action appears to have been one of the last attempts at removing blades from nearly exhausted cores. Some final-series blades also exhibit these kinds of opposition dorsal scaring. Additionally, complete or near complete exhausted unidirectional blade-cores were also recovered from similar contexts although the majority were recovered from investigations of ritual caches. At least 150 of these were classified as "*Objects from…*" and as stated above were notched, unifacially flaked, or seeming arbitrarily flaked to further destroy the core or core fragment. One object in particular was formed into a scorpion shape (A. Chase and D. Chase 2015a:87, Figure 52c). The creation of this representation took advantage of the larger overshot portion that makes up the scorpion's curved tail. The tips of its pinchers are slightly flat and exhibit residual traces of the striated core platform. In general, blade-cores from ritual caches fit well within already defined shapes that are present from sites such as Tikal (Moholy-Nagy 2003c). Not all destroyed or retouched blade-cores were crafted into symbolic or representational shapes.

Most blade-cores were recovered during the excavation of three large tombs and these contexts represent a redeposit of crafting debris (n=458, or 61.1%); however, this act only took place at these city center burials and only seven others from the more modest residential house groups. Burials, therefore are not as likely to include these objects (p=5.8 ± 3.52). They are even less likely to be recovered from household non-ritual investigations (p=3.2 ± 0.72). On the other hand, caches exhibit the highest probability of including exhausted blade-cores in general, and not just retouched blade-core objects (p=52.5 ± 10.68). This statistical significance is striking in comparison to the other contextual associations and suggests a further effort by crafters to curate these objects for rituals performed at various households beyond a given obsidian crafting workshop.

Also intriguing about the analysis of cache contexts that did include blade-cores is the observation that many caches (n=12, or ~40%) have blade-core refits. These observations are presented with greater detail in Chapter 7, but pointing this out here demonstrates the link between crafters curating these exhausted cores, possibly 'killing' them (i.e., destroying them) and maintaining these fragments together for a ritual offering. It will also be considered later, that this act of destruction took place beyond the workshop locale, and by those household inhabitants directly performing the ritual and making the offering. In either case, crafters curated these objects before they were circulated through a local exchange mechanism to then move to residences. At some point along an itinerary, many cores were destroyed through a fairly regular or standardized notching technique (see Table 5-21). Blade-cores, on their itinerary, within and outside a workshop experienced times of active handling by crafters and times of stasis before moving again to become part of the materiality of household ritual.

Non-blade-core-related objects and undiagnostics comprise about thirteen percent of the total analyzed obsidian collection. Non-blade-core-related debitage are those artifacts that do not exhibit local manufacture and are not associated with local blade-production. Thirty-one (or 54.7%) of these are flakes, probably from bifacial reduction; while eighteen (or 33.3%) are bifaces or projectile points. Debitage analysis shows there appears to be some biface finishing or retouching taking place at Caracol, yet despite this negligible activity, no green bifaces appear to be locally manufactured. These green Pachuca points were most likely imported with those foreigners entering the site (A. Chase and D. Chase 2011).

A last object of note among others (see Table 5-23), is the single obsidian pebble. As shown in Chapter 4, this object is from the La Union obsidian source area in northeastern Honduras and has been recorded by Joyce (n.d.). This object is one of the earliest obsidian objects recovered from Caracol and was found in a cache with other non-obsidian objects (Lomitola 2010). No attempt to explore the movement of this object has been attempted before, but the movement of this single object is probably tied to early relations Caracol had to the developing Copan polity and/or those sites nearby and perhaps exchanging with it. The object could have traveled on the same routes that brought ceramics and other materials, like jadeite, to Caracol. Non-blade-core related objects are rarely recovered in any great amount from any of the three contextual classifications. Undiagnostic artifacts also have little chance of being recovered from one of the three contextual classifications.

In summary, crafters followed broad similarities in obsidian reduction, blade production, and core rejuvenation. Caracol’s obsidian crafters, although inferred through an aggregate analysis of all obsidian artifacts from separate assemblages, preformed the same types of tasks as other studies have shown. In terms of introducing the contextual analysis, crafters appear to have known about how Classic period household inhabitants ritualized certain kinds of obsidian objects (e.g., blade-cores, rejuvenation debitage, and macro debitage). Thus planning for events at households and provisioning Caracol’s population was considered during workshop area maintenance (see Trachman 2002:117). It is also likely that this maintenance behavior to curate and then provision others with more than just blades, resulted in crafters erasing the dominate traces of their work areas. This may, in part, explain why that in over thirty years of investigation at Caracol, no definitive traces of an obsidian workshop have been discovered. This is also asserted against known data for other workshops that were clearly visible in the archaeological record (Johnson 2008, 2012, 2014, Jones 1996). The absence of obsidian workshops may also be likely because there were simply far fewer of them in comparison to chert workshops.

CHAPTER 6
OBSIDIAN EXCHANGE: FROM CRAFTER PRODUCERS TO RESIDENTIAL CONSUMERS

Although the nuances of markets and market exchange in Mesoamerican and the Maya area in particular are still be worked out, sufficient data have emerged from a number of sites to demonstrate the existence of local markets and show how these markets influence the distribution of raw materials and crafted objects (A. Chase and D Chase 2014; Masson and Freidel 2012; Masson, Freidel and Hirth 2013). In a recent treatment of the nature of market exchange in ancient societies some have suggested that markets in pre-capitalistic societies were likely “embedded” within existing social networks that predate the existence of market exchange (Garraty 2010:24-25; Hirth 2010:229-230). As Hirth (2010:229) asserts, embeddedness directs attention to the social relationships which can be fostered during social events and exchange, like those that could happen at markets. Positioned within the “substantivist” perspective of economy, I focus on this embeddness perspective because it offers a window to the exchange of materials and finished objects acted as reminders of social relations (see also King and Shaw 2015:3-4). As could be argued broadly, a constant negotiation of social relations was fundamental for the longevity and resiliency of Maya cities and states.

From an itinerary standpoint, the embeddness of markets within established and contingent social networks offers a point at which obsidian and places of exchange (i.e., market places) influenced the lives of humans. For example, before markets, obsidian objects may have been controlled by local elites, making access contingent on people’s ability to associate with elites through (non-market) taxation or some other political economic relationship. Yet, with the advent of markets and a greater reliance on “neighbors”, elites may have been de-centered in spheres of exchange, thus allowing broader access and new social relations to develop with those closer to or in control of the actual production of finished objects. Broader population access at these new points of connection (i.e., markets) within the landscape could have also influenced the pace and scale at which obsidian circulated regionally. Greater access to obsidian at markets could have put a strain on local crafters as well. Perhaps this broader access and need led to existing crafters teaching neophytes crafters (i.e., apprentices) so that demand could be met. Despite the lack of data available to help support these scenarios, markets were important points at which people and their materials influenced the pace and kind of life that was led.

Literature on the nature of Maya markets continues to reinvigorate the dynamism of ancient Maya economics (see Hirth and Pillsbury 2013; King and Shaw 2015). Chapter 6 aims to add to these newer and revisited datasets by focusing on particular material as it entered and left the marketplace. Specifically, I aim to test whether or not obsidian circulated through markets and, if so, what was the nature of consumption? The nature of consumption can help to inform the types of social relations that took place either at or apart from markets. The presence and influence of markets on obsidian exchange can also inform certain types of transformations. If obsidian circulated through markets, it would have been transformed from a product into a “commodity”, a possession, or something not yet envisioned by the consumer. The market and those interacting were also transformed through each transaction. Social relations were built, negotiated, maintained, or dissolved. The objects exchanged were an inseparable dimension of these social relations; without the material, the social would have been in jeopardy.

This chapter begins where others may otherwise struggle. The presence of decentralized markets within Caracol's boarders has been asserted for some time (A. Chase 1998; A. Chase and D. Chase 2001); therefore, there is no need to establish their existence *per se*. I do, however, address whether or not markets influenced the exchange and circulation of obsidian because this has not been rigorously tested until now. As a result, this chapter has a number of explicit goals. First, I briefly summarize the debates over market exchange research in the Maya area by contrasting market exchange with non-market exchange (or centralized with decentralized exchange).

Second, I use Caracol as a case-study to better understand if markets influenced the distribution of obsidian specifically. Simply put, if markets influenced the distribution of obsidian, then it should be widely distributed during the Classic period. Like other literature which addresses market influence, I also take advantage of Hirth's (1998) "distributional approach." To test this hypothesis, I apply three tests using a sample of residential households. Each test is designed to better understand the general pattern of consumption as well as to determine any nuances in consumption between residential units. These tests are: (1) an analysis of variation (ANOVA) which asserts whether or not there was a significant difference in flaked stone consumption (i.e., a ratio of obsidian to chert) between different kinds of groups; (2) a map of the distribution of obsidian sources to better visualize if obsidian source material was *diluted* across the landscape or somewhat clustered; and (3) a third statistical method is applied to better determine whether the average amounts of obsidian consumed was dependent on some social factor. Braswell (2010; see also Hirth 1998) has argued that dilution of obsidian sources across a widely sampled area supports the likelihood for markets influencing exchange and household consumption. I use residential size as a proxy for household wealth (see below). Specifically, I ask, "does wealth influence the mean obsidian count present at different sized groups or do wealthier groups exhibit a statistically significant higher mean amount of obsidian when compared to smaller groups?"

Before I present the test case data, I summarize the sampling strategy as it relates to these above objectives, keeping in mind that inferences are drawn from testing hypotheses against previously investigated residential groups. Despite possible sampling biases, I am confident that even with future investigations at the site, the results will continue to reinforce the conclusions present below.

Third, while markets likely influenced the overall access to both local and extra-local resources, was there a co-occurrence of non-market exchange? What evidence might we have or look for in the archeological record? To address this question, I present preliminary data regarding the importation of central Mexican obsidians as well as the distribution of certain ritualized obsidian artifacts to potentially determine the operation of non-market transactions. The three larger obsidian deposits within the city center add greater emphasis to the likelihood of non-market provisioning, as related to specific ritual events. Attempts to operationalized non-market exchange could focus on ritual practice and ritualized obsidians because they occur with less frequency overall in comparison to daily activities. As I have already shown in Chapter 5 there does appear to be some obsidian objects that are ritualized over others and therefore an analysis of their distribution may help to illuminate alternative exchanges that occurred outside market locales.

Fourth, I discuss briefly how these two broad exchange mechanisms may have impacted local flaked stone crafters? And finally, I summarize and relate the discussion of exchange via markets or other forms to the movement of obsidian along its itinerary.

Contrasting Models of Exchange: A Short Review

A model that stresses elites or top-down political economic management is often referred to as a *centralized redistribution economy.* The Classic Maya were once predominately characterized as having this type of political economy (Masson 2002). Elites in this centralized redistribution economy collectively controlled aspects of craft production and distribution of exotic or non-local goods (e.g., obsidian, shell, jadeite) (Aoyama 2001; Rice 2009), resulting in the uneven distribution of raw materials and crafted items at non-elite residences at some given distance to city centers or elite residential locales (Hirth 1998; Stark and Garraty 2010:50-51). However, with the advent of more intensive investigations at “commoner” households far beyond the elite or royal households in civic centers, increased attention was directed to the possibilities of marketplace exchange at Maya sites (A. Chase 1998; A. Chase and D. Chase 2001; D. Chase and A. Chase 2014a; Hirth 1998; Masson and Freidel 2012). Investigations directed attention to the material inventories of residential dwellings (Masson and Freidel 2012). Many of these settlement locales exhibited *proportional* access to non-local goods similar to those city center elites (see also Masson and Freidel 2013).

In considering of the possibility of a market economy, Mayanists have begun thinking about Maya political economy and exchange as *decentralized,* or as not being primarily managed by ritually-charged royal elites. This decentralized model downplays the role of elites as vital to the access of both local and extra-local goods. Furthermore, decentralized exchange refers to a system that is open to multiple participants not restricted by status, wealth, or subject to elite management, and where goods and services are available to a population through multiple places of commerce. These marketplaces may not have been directly managed by "the" elite, but rather involved the integration of high to low status groups (Huston el al. 2010). A result of this form of exchange is the relative equal access of goods and therefore goods become "homogenized" across a given area (e.g., D. Chase and A. Chase 1992; Hirth 1998). While providing equality of access across a given area, marketplaces act to integrate a population and therefore are involved in facilitating a place where individuals, groups, and a population identity is constructed and maintained over space and time (D. Chase and A. Chase 2004).

Much of the reason for this research in Mesoamerica is due in part to four things: (1) recent critiques by anthropological archaeologists of Polanyi's assertions that premodern markets were not likely a mechanism for allocating specific resources (see Garraty 2010:10-14; Feinman and Garraty 2010; Garraty and Stark 2010); (2) the increased sampling and greater artifact inventories of non-local goods (e.g., obsidian, shell, and jadeite) at many non-elite households (e.g., A. Chase et al. 2015); (3) the actual documentation and excavation of physical marketplaces (King and Shaw 2015), some of which are located near civic centers, while others are not (A. Chase et al. 2015); and (4) the systematic study of the distributions of various kinds of materials and spatial relationships between workshops, civic centers, marketplaces, and non-elite or non-royal consumers (D. Chase and A. Chase 2014a; A. Chase et al. 2008; Hirth 1998, 2010; Hutson et al. 2010; Masson and Freidel 2012).

With the advent of research into the presence and involvement in market exchange, archaeologists have to consider not only the movement of alienable goods – those goods that can be separated from those who produced them distributed through markets – but also the inalienable items that may have been exchanged through non-market exchanges directly between persons. The Classic Maya are argued to have multiple exchange mechanisms operating simultaneously (Braswell 2010, Rice 2009), thus a study of the movement of things must consider at least two forms of exchange: one that "homogenizes" materials across a settlement landscape (e.g., markets) and one that limits the exchange of certain materials and objects to certain contexts or between social status groups (e.g., non-markets). Here both decentralized (market) and individualized (non-market, person-to-person) models may be applicable. Discussions of person-to-person exchange often applies to a *gifting* economy. Operationalizing all that gifting includes is extremely difficult because much of this exchange fulfills some social obligation and cannot be measured in an archaeological analysis of commodities. These connections are difficult to establish in the archaeological record, but may sometimes be indicated in the analyses of restricted distributions.

Economic Integration, Markets, Sampling, and Wealth at Caracol, Belize: A Review

At Caracol, multiscale excavations have investigated monumental civic city center royal residences and continue to cross-cut a significant sample of different sized residential households. In Chapter 2 I presented a summary of the multiple lines of evidence in support of both a market economy and the presence of marketplaces at Caracol, Belize. Specifically, D. Chase and A. Chase (2014a) argue (1) that the *configuration* of certain architectural groups supports open market spaces and (2) that artifact *contextual* evidence from systematic sampling across an array of (3) *distributed* residential settlement (n= ≥118) shows households obtained a diverse suite of both extra-local and local materials. These data and interpretations continue to support earlier claims for a well-integrated economic landscape (A. Chase 1998; A. Chase and D. Chase 2001; D. Chase and A. Chase 2004).

Obsidian distribution data likewise should reinforce the presence of markets; however, before the findings are presented, project sampling methods are described generally to address any biases. In addition, because wealth may be a consideration affecting rates of residential material consumption, I define what I mean by wealth and how it may be measured using architectural data.

Archaeological excavations at Caracol follow a hierarchical order. *Operations* (Op or Ops) are the first order and are defined as the investigation of a given space. In most cases, a single household or residential plazuela group comprises an operation. *Suboperations* (SubOp or SubOps) as smaller units are typically investigations of single structures or other discrete areas within the given operation. These suboperations are further subdivided into excavated *Lots* or arbitrary excavation units usually defined on cultural strata. A typical investigation can be abbreviated as C100A/1, where *C* stands for Caracol, Op 100, SubOp A (B, C, D, and so forth), and Lot 1. SubOps are defined on the basis of further in more detail as their count helps normalize my subsampling strategy in the absence of excavated volume (m^3) or excavated surface area (m^2).

The number of SubOps or individual excavations within one larger investigated area (i.e., Op) does show that a wide area of Caracol's settlement was sampled and that these sampled areas are comparable when seen through the number and distribution of investigations. Table 6-1 provides the total Operations and SubOperations investigated at Caracol as of the 2014 field season. Figures 6-1 through 6-5 show that 62 operations were investigated by one (n=19) to two (n=43) SubOps (Figure 6-1), 72 operations were investigated by three (n=39) to four (n=33) SubOps (Figure 6-2), 41 operations were investigated by five (n=22) to six (n=19) SubOps (Figure 6-3), 14 operations were investigated by seven (n=6) to eight (n=8) SubOps (Figure 6-4), and 18 operations were investigated by nine and up to 24 separate SubOps (Figure 6-5).

Table 6-1. Summary table of total excavations or Sub-ops from Caracol showing a total of 207 operations were investigated with a total of 953 separate Sub-ops or individual excavations.

Sub-Ops per Excavation	1	2	3	4	5	6	7	8	9	11	12	13	15	18	21	22	23	24	
Count of each	19	43	39	33	22	19	6	8	3	3	3	1	2	1	1	2	1	1	207
Total	19	86	117	132	110	114	42	64	27	33	36	13	30	18	21	44	23	24	953

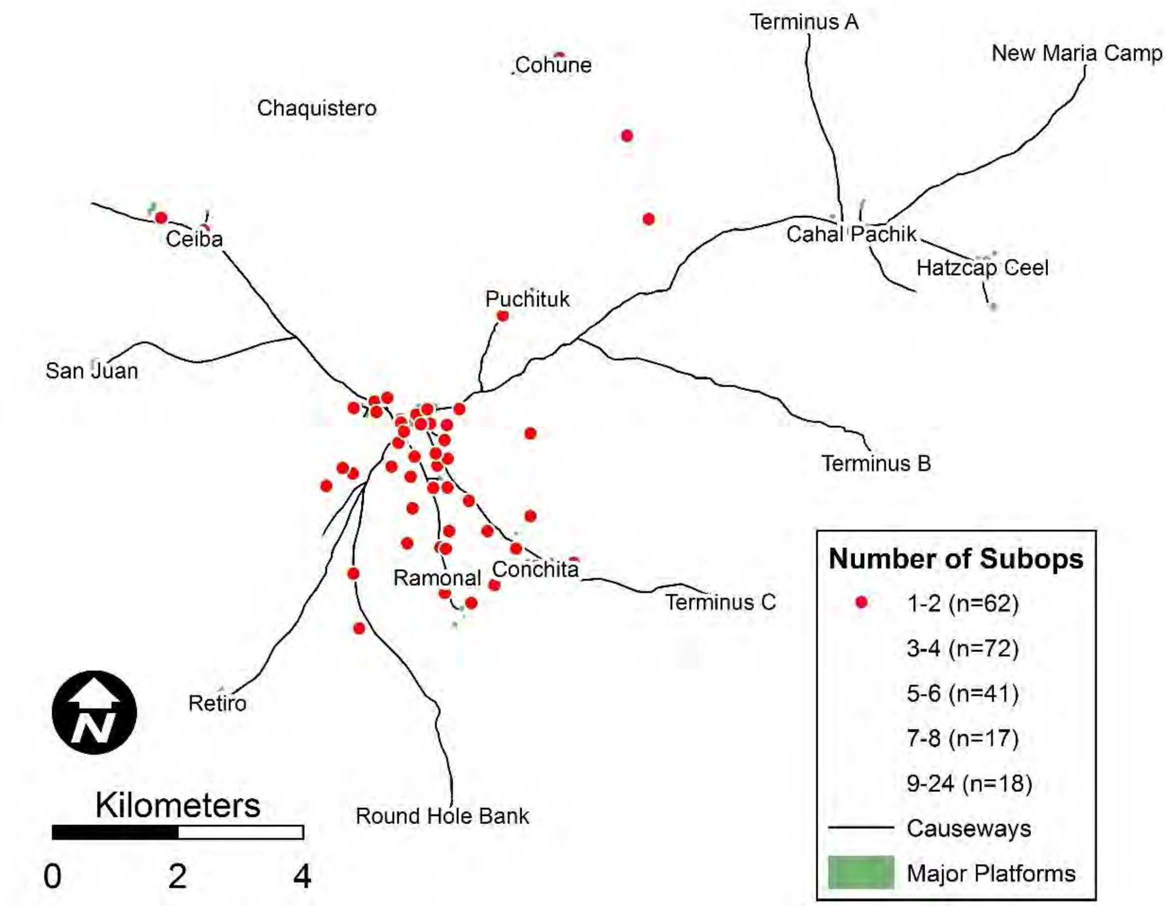


Figure 6-1. Distribution of excavation Operations that have one to two individual SubOperations.

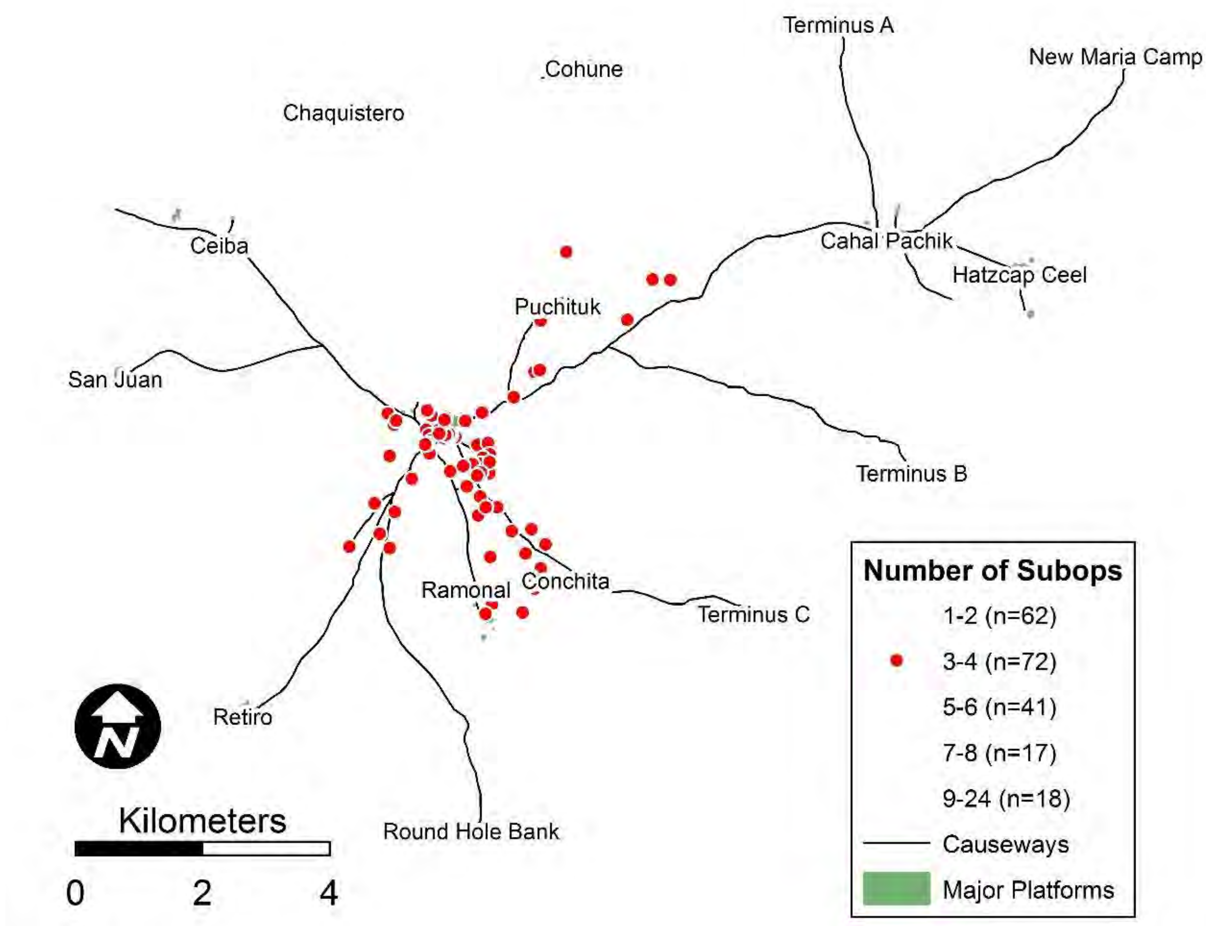


Figure 6-2. Distributions of excavation Operations that have three to four individual SubOperations.

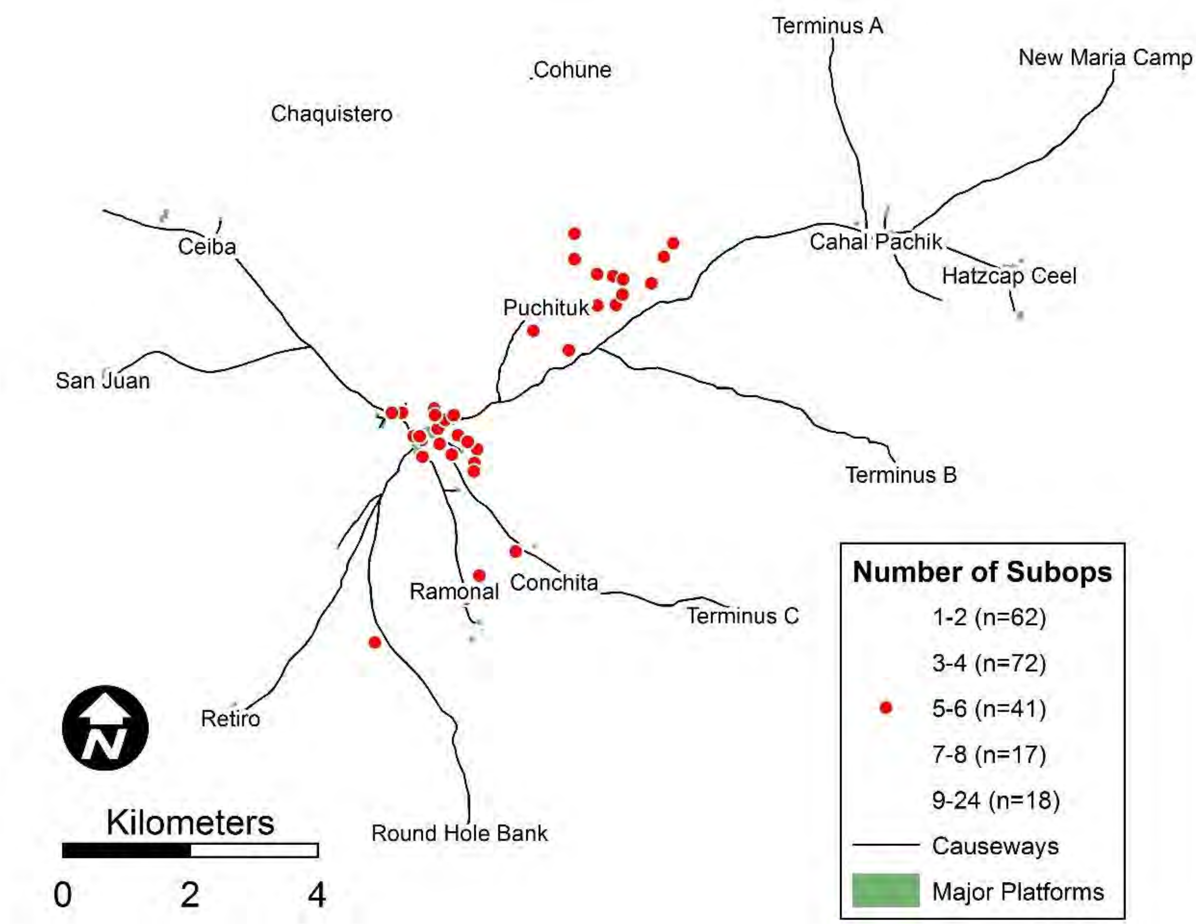


Figure 6-3. Distribution of excavation Operations that have five to six individual SubOperations.

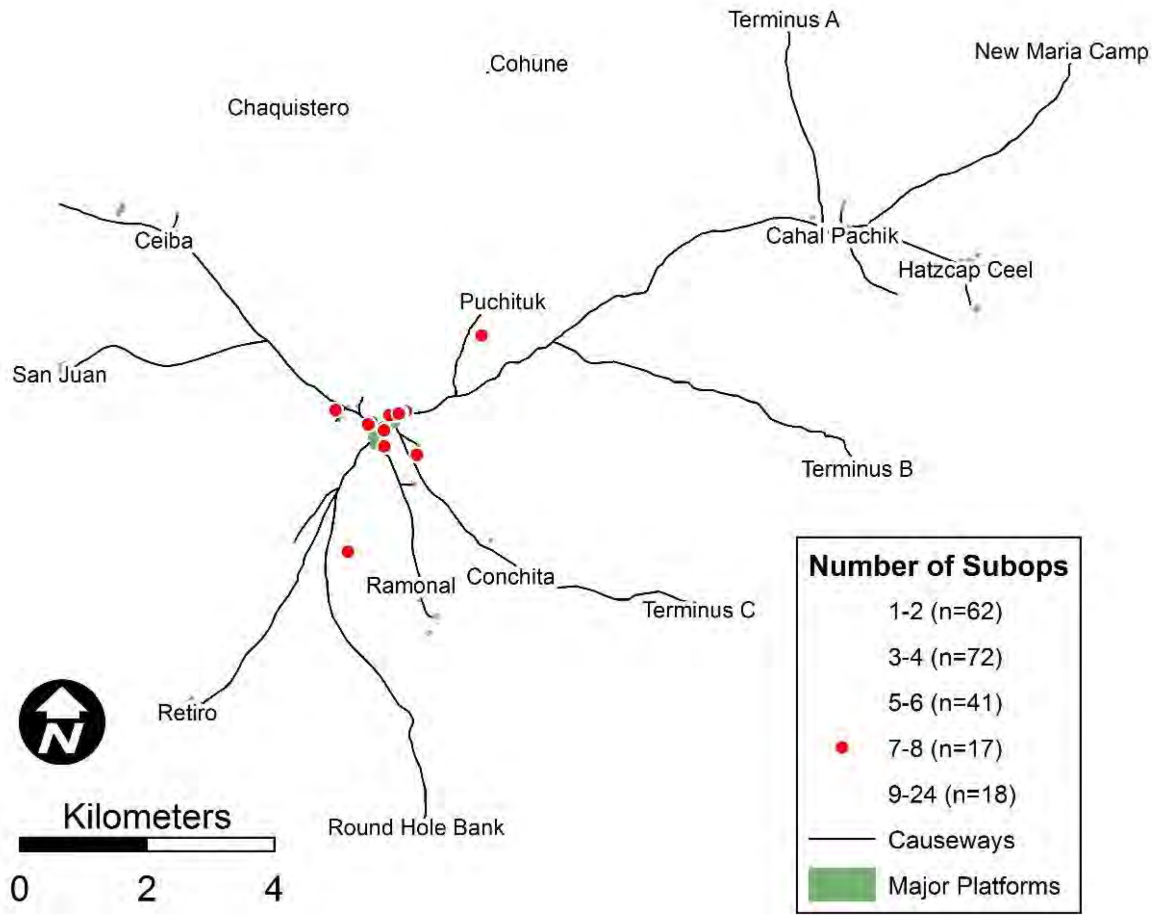


Figure 6-4. Distribution of excavation Operations that have seven to eight individual SubOperations.

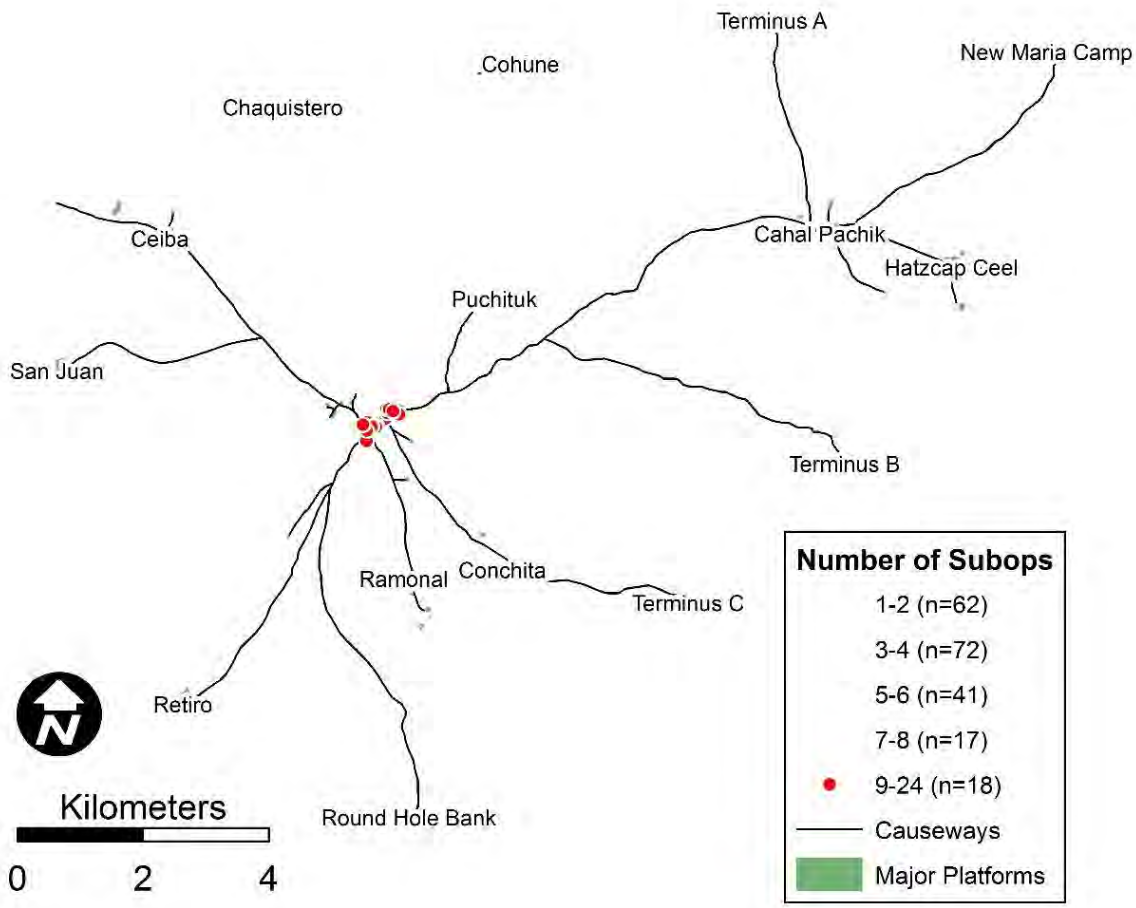


Figure 6-5. Distribution of excavation Operations that have nine to 24 individual SubOperations.

In total, 953 suboperations have been conducted to investigate a variety of questions over the past 30-plus years of archaeological work at Caracol leading up to this obsidian research. As part of a larger exploration of built space and/or "vacant" terrain, excavations (represented by SubOps) were typically placed in front, perpendicular, and on axis to structures to explore the interface between platforms edges and open plazas. These investigations often uncovered stairs that were sometimes built upon bedrock. A Caracol test-pit excavation usually measures 1.5 m x 1.5 m but can be 2 m x 2 m. Test pit excavations were also placed within the centers of residential plaza either to explore vacant terrain areas or possible mounded areas that may be small collapsed altars or other collections of cut limestone blocks. SubOps may also be short ≥3 m to long ≥15 m axial trench excavations that usually explored, structures, exposing more interior architecture and construction history. Trenches extend back from the front of structures to explore the building's summit and rear facing wall(s). These more penetrative excavations when placed in eastern structures at Caracol typically reveal burials and caches.

For perspective, field research is still ongoing and, therefore, this sample represents what was available for analysis as of the end of the 2015 field season. The importance behind providing the count and general descriptions of the kinds of excavations is to show the sampling strategy and that groups of different sizes were sampled in similar ways and are therefore generally commensurate for this distributional study of obsidian. For example, regardless of the size of structures most residential samples outside the city center includes explorations of eastern and northern or southern structures, as well as general surface collections when available. A minimum of three SubOps were carried out in most residential groups.

The operations that occurred within city center, however, usually have many more SubOps on average, given that the architectural spaces are usually larger and more complex. Investigation methods therefore required broader separation of space during excavations. In addition, a significant amount of conservation and architectural stabilization work has also occurred in the city center and therefore more earth has been moved, screened, and sampled as a necessary part of this work.

Most investigations at Caracol are continually directed towards understanding local economic diversity as reflected from residential artifact inventories. As a result of these excavations, A. Chase and D. Chase (2014a) have asserted that economically diverse house groups made up the bulk of Caracol's neighborhoods and communities. The sampling strategy as well as artifactual data have enabled this assessment as well as documented the presence of a market economy during the Classic period.

As a component of this general household diversity, status distinctions appear to be present at the site. These status or wealth differences are manifest in household artifact inventories, in tomb size (A. Chase 1992; D. Chase and A. Chase 1996), and general residential size (A. Chase and D. Chase 2014a) as well as in dietary evidence (A. Chase et al. 2001). Because of these social differences – manifest in different lines of evidence – the obsidian research is better positioned to also assess the equality of access across different status or wealth classes. These status differences are reflected broadly in household size or complexity (Figure 6-6) and a distributional sample shows that there is a frequent juxtaposition of large, medium, and small groups over the residential landscape (Figure 6-7). Those house groups with more structures are presumed to have greater wealth overall. Smaller house groups area assumed on the other end of the continuum.

One caveat must be noted before these distinctions are operationalized using the flaked stone data. Although much of the following sample does demonstrate measurable proxies for wealth, larger household may have simply been around longer and, thus, over time have gathered greater volume and complexity. Smaller households, therefore, may be newer and not as architecturally complex. However, if this were the default position, we would expect to see equal kinds of materials across both large and small households. This issue is addressed below using mean counts of obsidian by architectural size types; itis possible to look at this because of years of directed systematic research and sampling at various sized residences.

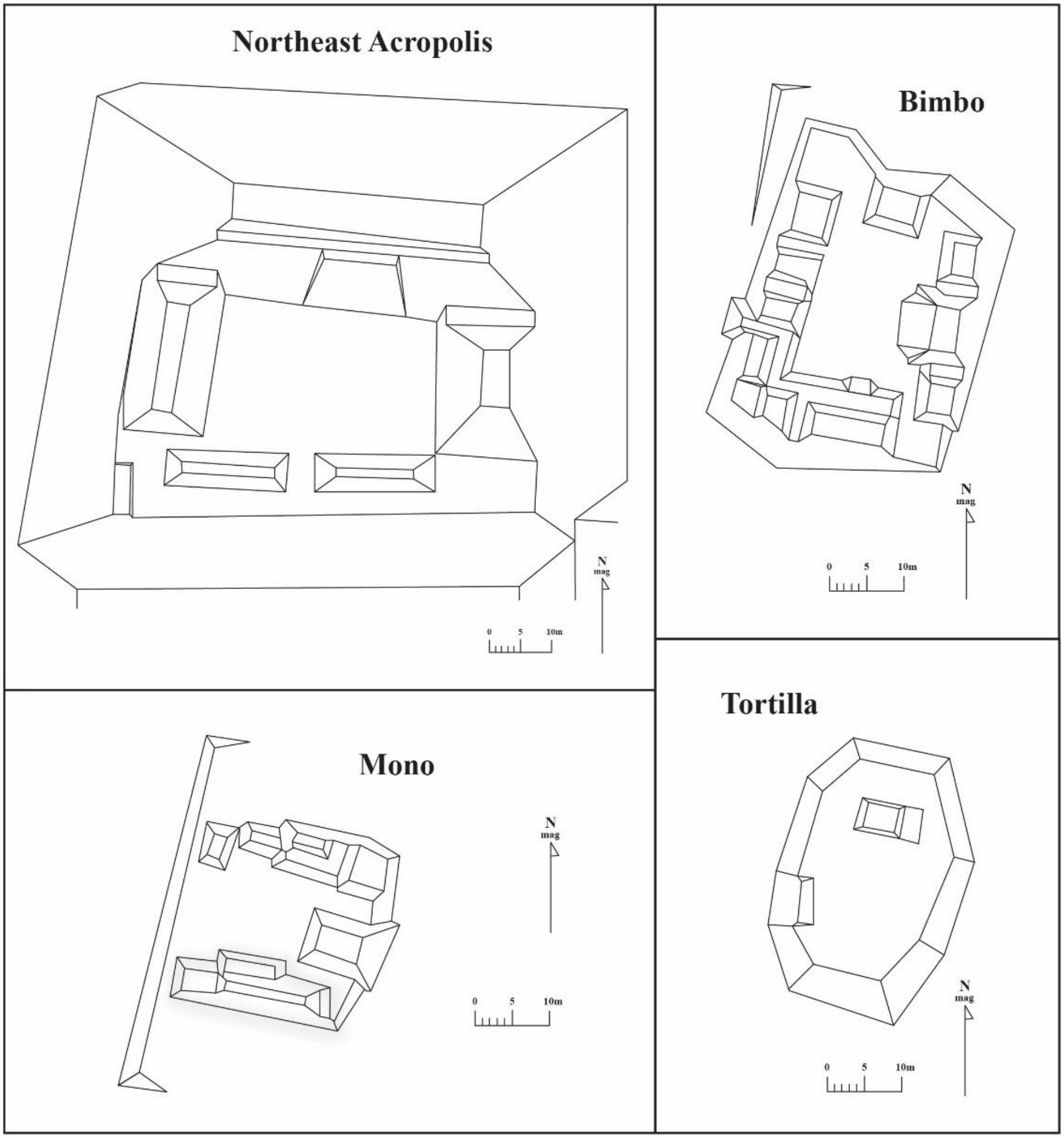


Figure 6-6. Examples of different size classes of residential groups based on number of structures per a given raised platform: Special use/royal residential – *Northeast Acropolis*, Operations C117, C181, C182, C182, C205; ≥6 structures – *Bimbo,* Operation C193; 4-5 structures – *Mono,* Operation C158; ≤3 structures – *Tortilla,* Operation C197. Image adapted from A. Chase and D. Chase (2014b:8, Figure 2).

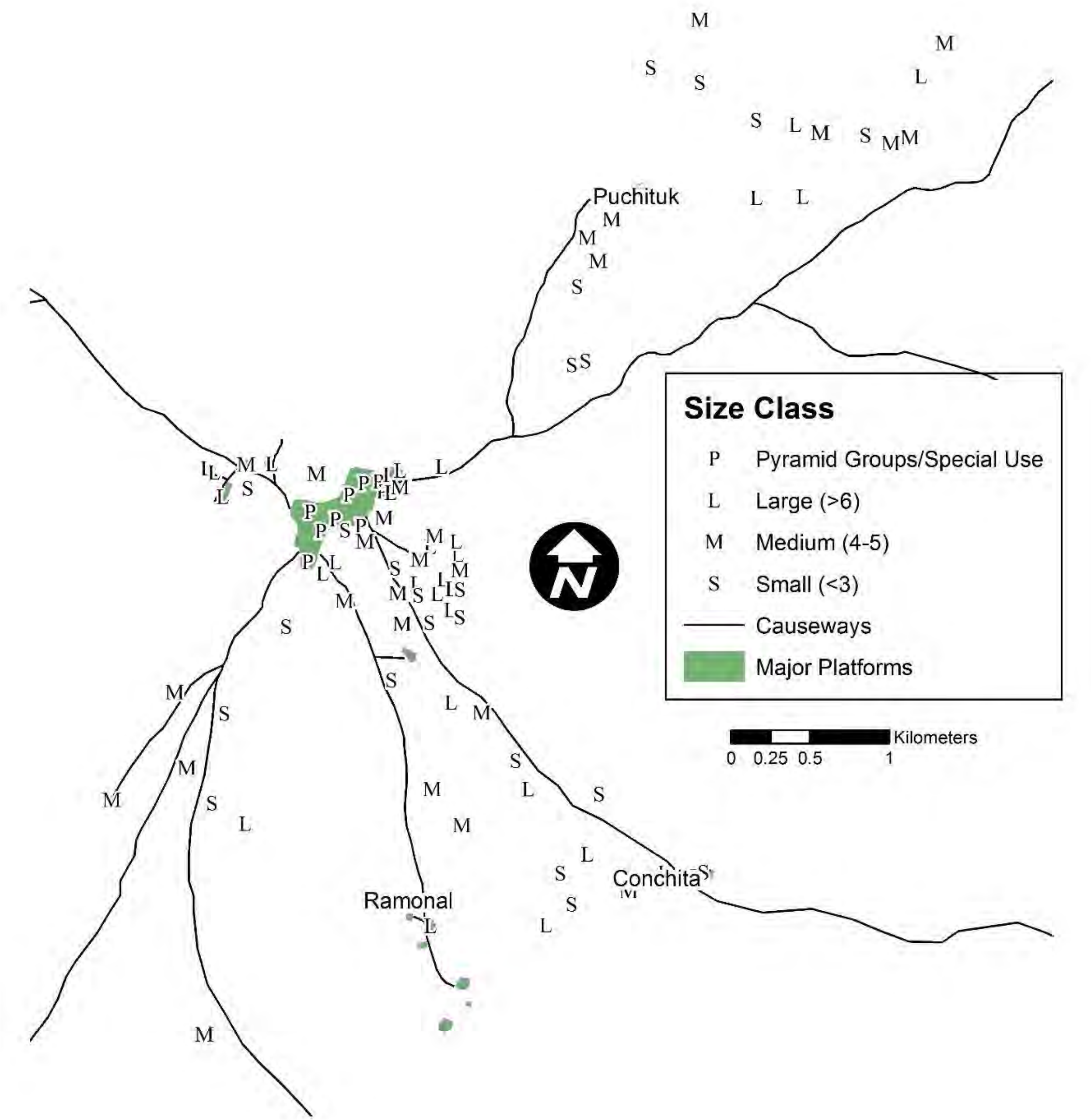


Figure 6-7. Subsample distribution of different size household types, (*Pyramid/Special Use*, n= 9; *Large*, n= 30; *Medium*, n= 28; *Small*, n= 24). Note that all *Pyramid/Special Use* groups are located in the city center where causeways converge and other classes are randomly distributed across the sampled settlement area.

Testing Centralized and Decentralized Models of Obsidian Exchange

One goal of this part of the research is the need to test for an equality of access to obsidian in order to further assert the already supported market interpretation proposed by D. Chase and A. Chase (2014a). An analysis of variation or a one-way ANOVA test was applied to a sample of both the obsidian and chert flaked stone data to determine if there is a significant difference or variation in the overall consumption of obsidian compared to chert by different households or residential size types. The hypotheses are:

Null hypothesis: There is a significant difference in ratio amounts between different sized groups. In other words, those larger groups or those possessing greater wealth, are expected to have a higher ratio or proportion of obsidian to chert because they could exercise greater purchasing power during exchange.

Alternative hypothesis: There is no significance between group size and consumption ratio (obsidian:chert). In other words, the size of the group, a proxy for wealth, does not influence the proportion of different types of flaked stone obtained through exchange, implying that markets influenced the distribution of obsidian.

Test 1: Equality of Access to Obsidian and Analysis of Variation (ANOVA)

Figure 6-6 showed four architectural groups based on the number of structures per a given raised residential platform. I used published survey maps (A. Chase and D. Chase 1987:63-84) as well as project field reports (caracol.org) to determine actual structure counts. These groups were analyzed for the recovered amounts of both obsidian and chert (see Appendix A). These two tool stone types were chosen for comparison because Caracol inhabitants used both as blade tools (Johnson 2008;

Johnson et al. 2014; Johnson and Johnson 2016; Pope 1994; Jones 1996). Chert was chosen as part of this hypothesis because previous research has shown it could have substituted for obsidian tool stone and that production techniques and finished tools were also comparable (Johnson and Johnson 2016). Recent research into Caracol's chert production has further demonstrated that crafters were producing chert blades from both polyhedral pressure cores (like those of obsidian) as well as unidirectional percussion cores (Johnson et al. 2014). Other research on chert artifacts shows, that regardless of core type, the product was the same: producing fairly robust blades with both a cutting edge and a sharp distal bit or tip. No other artifact data (e.g., ceramics, shell, jadeite) or volume/surface area excavated was available at the time of this research project with which comparisons could be made. (see Masson and Freidel 2012, Hirth 1998, Hutson et al. 2010), but it is likely that comparisons of other distributed materials would be similar to those presented below (see also A. Chase and D. Chase 2014b).

A ratio (*obsidian:chert*) was developed that divided obsidian raw material counts by chert raw materials counts where the count of obsidian is always less than chert so that the ratio is always less than one. This calculation method is reasoned by the presumption that chert was both more accessible, and more abundant; it was a local resource and widely available in the karstic bedrock that forms most of the Maya Mountains. Therefore, an obsidian:chert ratio value of 0.1 is interpreted as one obsidian artifact per every ten chert artifacts (0.01 would indicate one obsidian object for every 100 and so forth). Obsidian consumption amounts should be less overall in quantity because this resource was subject to irregular importation from distant quarries in the highlands of Guatemala or elsewhere in the Mesoamerican region.

Another discriminating factor in sampling architectural groups was to exclude known or presumed chert workshops from the sample. This was done so that the proportion (obsidian:chert) of *lithic consuming households* could be properly assessed without introducing bias through the inclusion of major consumers/producers of lithic *tools* (see Johnson et al. 2015). Likewise, the three above-tomb chamber deposits were also excluded from the analysis. These eventful burial deposits would have introduced significant bias into analyses of variation in *lithic consumers*. A review of Appendix A provides raw obsidian and chert counts for each operation and therefore other tests can be conducted using a wider sample. Even though the sample did utilize some discriminating factors, 90 Operations (or 639 SubOps) were included in the analysis. The analytical methods compare raw counts of obsidian and chert and does not concentrate on comparisons of just blade tools (see Masson and Freidel 2013) because of the reasons stated above regarding the similarity in reduction technique and blade tool usage. Although obsidian certainly provides a sharper cutting edge overall, lithic crafters at Caracol appear to have utilized both materials as quotidian blade tools. Table 6-2 shows the sample size and ratio per Operation within each group size type.

Table 6-2. Obsidian to chert ratios by group size type where ratios are less than 1.0. Actual number of both chert and obsidian artifacts is listed in Appendix A. Note: *Pyramid/Special Use* groups included 24 operations with 283 suboperations or an average of 12 per operations, but are eight broader city center investigations. *Large* group sample size is 30 operations with 154 suboperations and an average of 5 suboperations. *Medium* group sample size is 28 operations with 113 suboperations and an average of 4 suboperations. *Small* group sample size is 24 operations with 89 suboperations and an average of 3 suboperations. Suboperation count (SubOp Ct.) by individual Operations (Op #) is provided in parentheses.

Pyramid/Special Use (Subop Ct.)	Ratio	Large (≥ 6) by Op # (Subop Ct.)	Ratio	Medium (4-5) by Op # (Subop Ct.)	Ratio	Small (≤ 3) by Op # (Subop Ct.)	Ratio
A Group/Plaza* (Various Op #s) (64)	0.178	5 (6)	0.750	6 (2)	0.173	9 (1)	0.138
Ball Courts (Various Op #s) (3)	0.085	38 (6)	0.125	19* (1)	0.829	51 (3)	0.344
Barrio (Various Op #s) (35)	0.069	60 (3)	0.109	29 (1)	0.313	57 (3)	0.071
Caana (Various Op #s) (93)	0.068	64 (2)	0.500	36 (2)	0.355	58 (3)	0.018
Camp Excavations (Various Op #s) (6)	0.326	67 (1)	0.031	42 (2)	0.176	98 (4)	0.393
Central Acropolis* (Various Op #s) (47)	0.267	116 (4)	0.475	63 (3)	0.021	197 (4)	0.244
Northeast Acropolis (Various Op #s) (11)	0.067	119 (6)	0.034	65 (2)	0.106	14 (5)	0.291
South Acropolis (Various Op #s) (24)	0.188	121 (3)	0.286	74 (2)	0.625	22 (6)	0.352
		180 (5)	0.412	79 (5)	0.242	31 (4)	0.033
		185 (4)	0.249	83 (5)	0.143	33 (2)	0.214
		195 (4)	0.260	85 (5)	0.079	34 (3)	0.034
		46 (3)	0.034	110 (5)	0.267	49** (4)	0.418
		59 (2)	0.905	127 (6)	0.010	68 (2)	0.526
		66 (2)	0.043	147 (3)	0.036	99 (3)	0.021
		75 (8)	0.292	191 (5)	0.214	105 (5)	0.056
		102 (6)	0.017	84 (3)	0.017	106 (4)	0.091
		104 (5)	0.058	107 (4)	0.028	108 (5)	0.068
		172 (5)	0.199	118 (6)	0.387	109 (4)	0.069
		179 (8)	0.144	124 (4)	0.127	123 (7)	0.100
		184 (7)	0.186	125 (6)	0.019	131 (4)	0.018
		188 (6)	0.118	129 (4)	0.022	139 (3)	0.013
		190 (4)	0.095	130 (6)	0.013	143 (3)	0.162
		194 (4)	0.269	132 (6)	0.056	198 (3)	0.017
		196 (5)	0.089	138 (3)	0.142	201 (4)	0.614
		199 (5)	0.240	158 (5)	0.136		
		140 (8)	0.133	171 (4)	0.158		
		169 (9)	0.369	192 (3)	0.094		
		111 (5)	0.029	204 (2)	0.864		
		193 (8)	0.219				
		189 (4)	0.354				
Total obsidian	2,737		1,329		931		476
Total chert	18,864		7,831		7,252		3,171
Total of obsidian included in sample 5,473 or 27.9%							
Total of chert included in sample 37,118 or 45.7%							
Total of obsidian not included in sample 14,119 or 72.1%							
Total of chert not included in sample 44,006 or 54.3%							

* Ratio calculated from obsidian not associated with burial chamber deposit

** Ratio calculated does not include Op C49D investigations during the 2015 field season

Results: Analysis of Variation (ANOVA)

Table 6-3 shows the results of the ANOVA test data. Through the analysis of variation of ratio data, the null hypothesis is rejected. There is no statistical significance between size type and the ratio of obsidian to chert consumption. This lends further support to the assertion that Caracol's markets were a mechanism for exchange distributed an equal proportion of obsidian to chert across the sampled settlement area. Those pyramid and larger groups do not show a statistical difference when compared to those small, and possibly likely less wealthy, groups, especially when the overall variations in proportions of extra-local to local flaked stone materials is compared.

Table 6-3. Summary of ANOVA test data.

Group Type	n=	Sum	Mean	$Mean^2$
Pyramid Groups and/or Special Use	8	1.249	0.156	0.024
Large (6 or more structures)	30	7.023	0.234	1.299
Medium (4-5 structures)	28	5.648	0.202	1.427
Small (3 or fewer structures)	24	4.306	0.179	0.727
All groups	90	18.226	-	-
SSW (sum of squares within groups)	3.525			
SSBG (sum of squares between groups)	0.068			
SST (sum of squares total)	3.593			
d.f. (degrees of freedom) SSBG	3 (0.022)	Numerator		
d.f. SSW	86 (0.040)	Denominator		
f-ratio	0.55	0.55 <2 .7 Must reject null hypothesis		
f-critical	2.7 (*P*=0.05)			

Test 2: Dilution of Obsidian Sources into Residential Settlement

Braswell (2010) and Hirth (1998) both assert that in market economies many materials will be widely distributed across a provisioning area. In particular, Hirth (1998:461) states: "Procurement of obsidian from vendors in a marketplace will produce homogeneity of household assemblages in type of obsidian consumed, as all households will have access to the same sources of supply." I use this assumption to develop and evaluate another set of hypotheses using obsidian data from Caracal. It has already been demonstrated that El Chayal obsidian was the most abundant obsidian source imported into Caracol, while Ixtepeque, San Martin (de Jilotepeque) and other non-Guatemalan obsidian comprise very little of the source assemblage (see Chapter 4). Contrasting Guatemalan obsidian sources to non-Guatemalan sources, their distributions can be mapped during the Classic period to better understand the impact of markets. As already presented in Chapter 4, the presence of Ixtepeque obsidian in particular is very low (8.3%), and widely diluted across the sampled area. This also adds greater weight to interpretations (i.e., there is less to go around, but it is still widely diluted). The hypotheses are:

Null Hypothesis: The distribution of obsidian sources during the Classic period is diluted across the sampled settlement area. Obsidian sources are not clustered in one area, nor are they unequally distributed among the wealthy and most architecturally complex house groups.

Alternative Hypothesis: The distribution of obsidian sources is not diluted and is therefore spatially clustered due to some non-market form of exchange or some other yet unexplored factor.

Results: Obsidian Source Distribution

Through a summary of the HHpXRF data presented in Chapter 5, a decentralized distributional model is also evident in that the dominant sources imported into Caracol (e.g., El Chayal and Ixtepeque) are present throughout the sampled residences (see Figure 4-9 and Figure 4-10); however, in contrast Mexican obsidian sources tend to be clustered (Figure 6-8 and Figure 6-9). This concentration could perhaps signal two likely scenarios. First, Mexican obsidian (imported as finished objects usually included in ritual deposits) could have been traded directly with those intended users. This scenario supports a more gifting-based exchange or alliance-building between non-locals. Second, as these items entered Caracol, they were exclusively traded through those markets that directly provisioned local elites living in the city center. Despite contrasting interpretations, the distribution of Guatemalan sources was likely caused by the dilution of obsidian to all households through market interaction (Braswell 2010; Hirth 1988).

Based on these two tests (i.e., ANOVA and source distribution), we can see statistically similar proportions or amounts of obsidian to chert as well as the wide dilution of Guatemalan obsidian sources, across different sized residences throughout the sample area. The distribution of Mexican obsidian, however, clusters tightly around the city center and may suggest different types of exchange for objects that traveled even greater distances that those coming from the Guatemalan highlands. Figure 6-10 uses actual counts of obsidian from the sample data provided in Table 6-2 to create an obsidian density (e.g., spline interpolation) map that shows the dilution of obsidian across the sampled area. This density map illustrates that obsidian is predicted to occur in the sampled area regardless of proximity to city center.

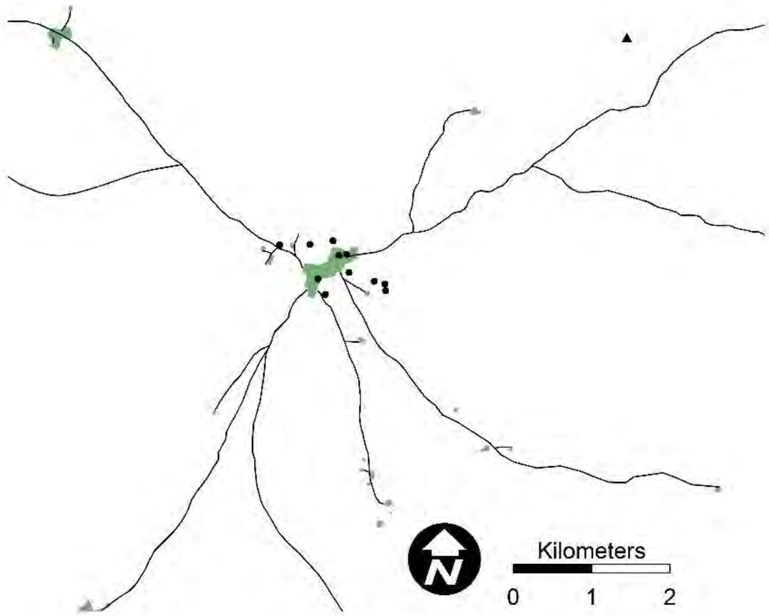


Figure 6-8. Distribution of Mexican obsidian (clustered around city center) and one La Union piece (plotted to the northeast).

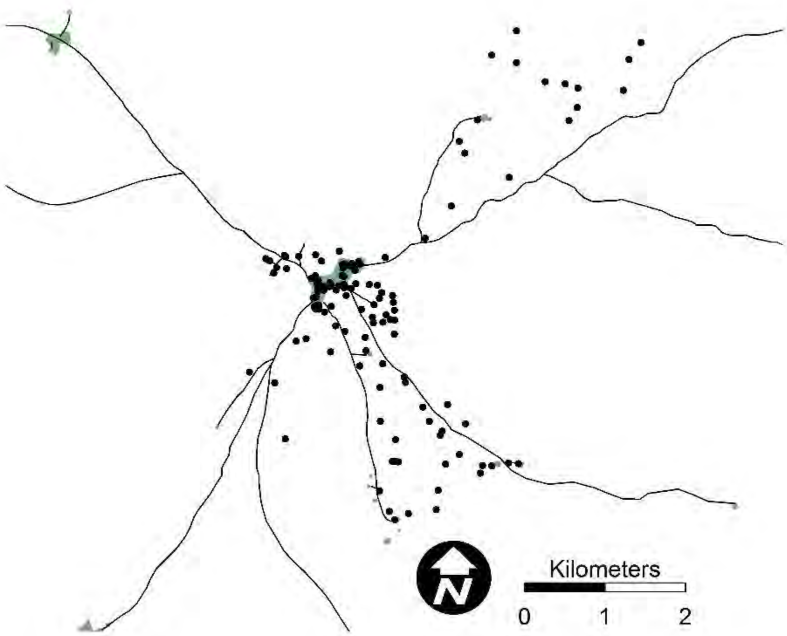


Figure 6-9. Distribution of Guatemalan obsidian.

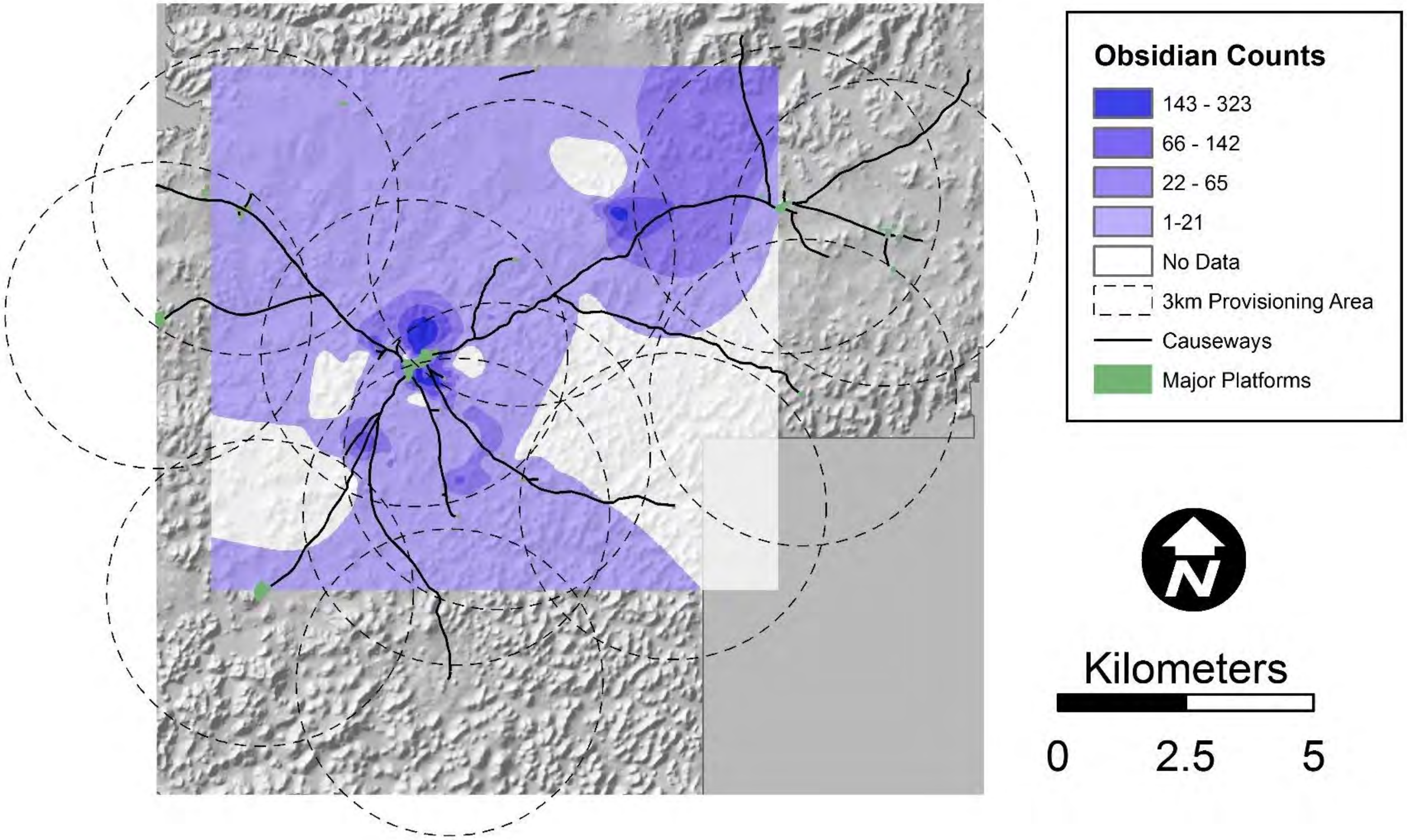


Figure 6-10. Obsidian distribution spline interpolation map predicting distribution of obsidian counts for sampled and un-sampled areas. Colored values are derived from the real count of obsidian from excavations. Obsidian counts from three above tomb chamber deposits are excluded. Dashed circles represent 3 km provisioning radii of local markets located at various locations (adapted from D. Chase and A. Chase 2014a:243, Figure 4). Note that nearly the entire settlement area is predicted to at least have 1-21 pieces of obsidian based on the available sample and that many areas within and outside the city center exhibit higher actual counts.

Relations between Obsidian Consumption and Household Wealth

The above analytical tests support the assertion that markets did influence the distribution of obsidian across the residential settlement. The next section takes the distributional analysis one step further to better understand the possible influence of differential access to obsidian based on wealth (measured by residential size) within the market economy. This more nuanced test of the data does not aim to undermine the presence of markets. Rather, the intention is to better understand whether differences existed between the purchasing power of presumed wealthier groups in comparison to those groups with less overall wealth. Arlen Chase, Diane Chase, and C. White (2001) have already asserted that dietary differences did exist at the site with those of higher status (i.e., greater wealth) having a better diet. The tests below are designed to further analyze these interpretations.

Test 3: Measuring Differential Access to Obsidian Based on Household Size

Household size or the number of structures per a given residence is used to develop the following statistical analysis to discuss differential access to obsidian via a particular social and physical marker of wealth. The hypotheses are:

Null Hypothesis: Like the first test that showed a lack of significant variation across the four types of architectural complexity, I assert that when assessing the overall consumption of obsidian specifically – not a proportion of flaked stone – there will continue to be no significant difference between the mean amounts of obsidian in comparison to indicators of wealth. In other words, assuming commensurate sample sizes there will be no statistical difference between residences of different size.

Alternative Hypothesis: There is a significant difference in obsidian consumption between the four residential size types. These differences will be, like others have shown (see Hutson et al. 2010), that those wealthy and larger groups have a statistically significant greater mean amount of obsidian due to greater purchasing power.

A series of chi-square test iterations were performed to better examine and understand differing mean obsidian counts by residential size type (Table 6-4, Table 6-5, Table 6-6, Table 6-7, and Table 6-8). A chi-square test compares an observed distribution to a theoretical or expected value:

$$X^2 = \sum \frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

Is the observed value (or association) statistically different from an expected value (or association)? In this implementation, this statistic is used to test hypotheses regarding whether or not those groups that are larger over all (i.e., more structures on a single raised platform [Figure 6-6]) had a greater access to obsidian. As stated before, the greater number of structures at a given residence is used here as a proxy for wealth or overall greater status when compared to those with lesser and smaller structures on a given raised platform.

Table 6-4. Iteration one. Chi-square distribution testing the null hypothesis that there is no significant difference in mean obsidian consumption counts between the four ranked groups.

Obsidian	Pyramid/Special Use	Large (≥ 6)	Medium (4-5)	Small (≤ 3)	Totals
Observed mean	342.1	44.3	33.2	19.8	
Expected mean	(60.8)	(60.8)	(60.8)	(60.8)	
Sample size=	8	30	28	24	90
Obsidian Total=	2,737	1,329	931	476	5,473
Chi-square statistic	1301.5	4.5	12.5	27.6	706.8
Reject Null Hypothesis. 706.8 > 7.8 (critical value), p=.05, 95% confidence, d.f. 3					

Table 6-5. Iteration two. Chi-square distribution testing the null hypothesis that there is no significant difference in mean obsidian consumption counts between the large, medium, and small ranked groups.

Obsidian	Large (≥ 6)	Medium (4-5)	Small (≤ 3)	Totals
Observed mean	44.3	33.2	19.8	
Expected mean	33.3	33.3	33.3	
Sample size=	30	28	24	82
Obsidian Total=	1,329	931	476	2,736
Chi-square statistic	3.6	0.0	5.4	9.1
Reject the Null Hypothesis. 9.1 > 5.9 (critical value), p=.05, 95% confidence, d.f. 2				

Table 6-6. Iteration three. Chi-square distribution testing the null hypothesis that there is no significant difference in mean obsidian consumption counts between the large and small groups.

Obsidian	Large (≥ 6)	Small (≤ 3)	Totals
Observed mean	44.3	19.8	
Expected mean	24.4	24.4	
Sample size=	30	24	74
Obsidian Total=	1,329	476	1,805
Chi-square statistic	16.2	0.8	17.0
Reject the Null Hypothesis. 17.0 > 3.8 (critical value), p=.05, 95% confidence, d.f., 1			

Table 6-7. Iteration four. Chi-square distribution testing the null hypothesis that there is no significant difference in mean obsidian consumption counts between the medium and small groups.

Obsidian	Medium (4-5)	Small (≤ 3)	Totals
Observed mean	33.2	19.8	
Expected mean	27.0	27.0	
Sample size=	28	24	52
Obsidian Total=	931	476	1,407
Chi-square statistic	1.4	1.9	3.3
Cannot Reject the Null Hypothesis. 3.3 < 3.8 (critical value), p=.05, 95% confidence, d.f. 1			

Table 6-8. Iteration five. Chi-square distribution testing the null hypothesis that there is no significant difference in mean obsidian consumption counts between the large and medium groups.

Obsidian	Large (≥ 6)	Medium (4-5)	Totals
Observed mean	44.3	33.2	
Expected mean	38.9	38.9	
Sample size=	30	28	58
Obsidian Total=	1,329	931	2,260
Chi-square statistic	0.7	0.8	1.5
Cannot Reject the Null Hypothesis. 1.5 < 3.8 (critical value), p=.05, 95% confidence, d.f. 1			

Results: Houshold Wealth and Obsidian Consumption

Iteration one suggests that there is a fundamental inequality when comparing mean amounts of obsidian across all four groups (Table 6-4). This observation therefore warranted other iterations. The second iteration logically eliminated the royal residential sample based on the high mean obsidian count by comparing those groups located beyond the city center (Table 6-5). This test also showed there is a fundamental inequality of mean obsidian access between groups even with the largest city center groups excluded. The next series of iterations compared the likelihood of equality of mean obsidian access across different combination of group size type. There was a significance difference when comparing large to small groups (Table 6-6), but not a significant difference when comparing large to medium types (Table 6-7) and medium to small group types (Table 6-8).

These data show, that the size of the group or wealth does affect the mean amount of obsidian consumed. There is a correlation or relationship between the sizes of group and the mean amount of obsidian. Those with more wealth could purchase more obsidian overall and those with less wealth – those living in small groups – could purchase obsidian, but less than other groups overall. In other words, the differences shown through this statistical method, as some may argue (Hutson et al. 2010; Masson and Freidel 2012), could be due to subtle wealth differences where larger households have greater purchasing power at their nearby market and smaller households have less purchasing power. Sampling among each type of household size is generally commensurate, so these differences are not likely due to sampling error.

As I have already shown, access to obsidian was not restricted overall, but there are statistical differences in mean obsidian counts by residential size type and this perhaps was caused by differences in wealth and therefore greater purchasing power at local markets. Figure 6-11 shows a density map derived from using inverse distance weight (IDW) that interpolates an elevation-like surface based on mean obsidian count by the size of group. This figure shows that although access to obsidian is widespread, there was a difference between the mean amounts of obsidian consumed. As noted earlier, another possible explanation may include larger household groups may also have longer occupational allowing more obsidian to accumulate.

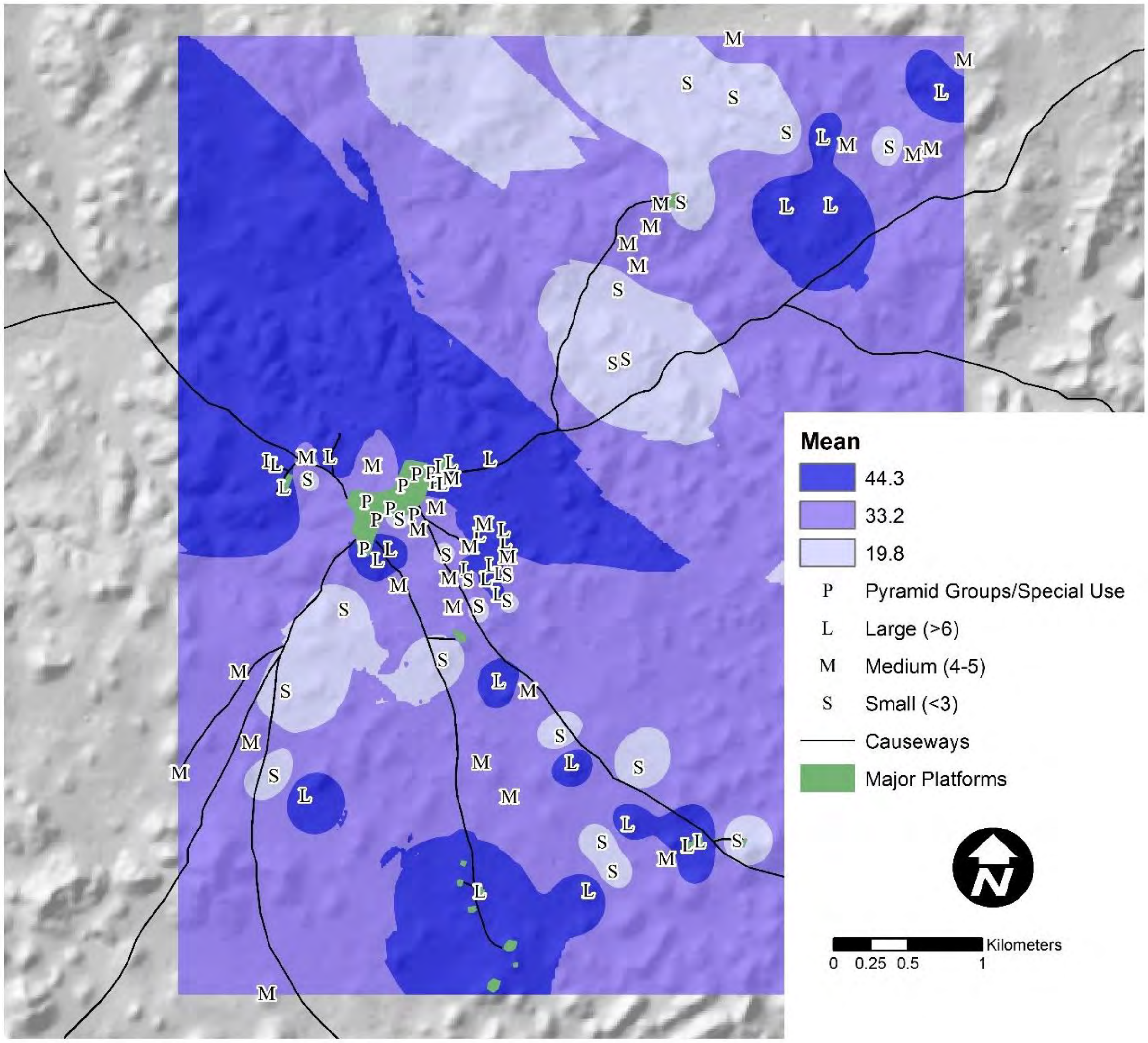


Figure 6-11. Inverse distance weight (IDW) interpolation density model showing the spatial relationships between those sampled larger groups (mean = 44.3) to other medium (mean = 33.2) and small (mean = 19.8) sized groups. Notice that obsidian distribution is predicted throughout the un-sampled area (see Figure 6-10). The difference in mean count is statistically dependent on the possibly greater purchasing power of large residences located adjacent to and far outside the city center. *Pyramid/Special Use* areas within the city center area were excluded from this IDW interpolation model because the group mean of these eight investigations is statistically higher than other size classes (n=2,737; mean=342.1).

Considering Non-Market Exchange

While the bulk of the data thus far have supported the interpretation that markets significantly influenced the distribution of obsidian, I would like to consider the co-occurrence of non-market transactions. There are at least two examples to describe. These include: (1) the importation and distribution of non-Guatemalan obsidian objects and (2) the deposition of large quantities of obsidian above three elite vaulted tombs. (A potential third example could be included that contends with the distribution of ritualized obsidian eccentrics (see Chapter 6 and 8), but their overall distribution appears to be indicative of access through markets. The sample size of these is such that I cannot confidently claim their circulation through non-market exchange.) I will take each in turn and discuss their possible exchange outside the market economy. The examples presented, with the exception of the distribution of non-Guatemala obsidian, are intended to foreshadow Chapter 8 where data distinguishes between quotidian and ritual uses of obsidian.

Interestingly, each of these examples contends with objects that add to the materialization of ritual activities; thus each could be discussed in terms of a "ritual economy" or more explicitly "ritual finance" (Wells 2006, 2007; see also Rice 2009:72). A ritual economy according to Wells (2006:284) is "a theoretical construct that concerns the materialization of socially negotiated values and beliefs through the acquisition and consumption aimed at managing meaning and shaping interpretations." In other words, materials are acquired to carry out performances to express particular "on-going processes of negotiating and materializing a group's values, morals, and ideals through ritual action" (Wells 2006:285). Acquisition of ritual objects or paraphernalia can occur through different types of exchange, but their distributions may reflect more intra-personal exchanges by being more restricted in overall distribution.

Mexican obsidian sources are clustered around the city center. A significant amount of green Pachuca obsidian was recovered from a cremation burial deep within an earlier plaza surface of the Northeast Acropolis, signaling a particular status distinction with the acquisition and use of these items in a burial rite (A. Chase and D. Chase 2011). Other Mexican obsidian, however was not recovered from ritual deposits. These were recovered during general excavations within city center architecture. Despite these non-ritual excavations, the distributions (see Figure 4-11) suggests limited or restricted circulations either through elite-gifting or through their availability only from the epicentral marketplace.

Technological attributes also help to show the form in which the objects were traded. Eight of the fifteen (or 53%) objects scanned using HHpXRF are bifaces or finely crafted projectile points. No evidence thus far suggests these were locally produced. As stated above, objects traded into Caracol could have been traded directly with city center elites, therefore acting to connect and reassert Caracol's political and economic power. Alternatively, obsidian resources could have entered directly into city center markets and rather than other markets further afield.

Also at odds with markets being the only mode of exchange is the presence of dense obsidian concentrations associated with at least three elite tombs (n= 12,458, see also Table 7-13). Arguably, these larger amounts of obsidian could not have been obtained from markets due the logistics in carrying such quantities to markets, and then carrying to their final deposition above a vaulted tomb. It is rather more likely that obsidian workshop crafters must have had some more interpersonal relationship with those involved with interring the deceased elite individuals and may have directly planned the movement of this material accordingly. The first occurrence of this type of relationship was at the Machete group in AD 613. This group was certainly a high status group, but the other two occurrences of depositing obsidian with elite tomb burials occurred almost one hundred years later. Other sites may have practiced these acts even earlier (Trachman 2002:116-117). The obsidian from the three above-tomb contexts is primarily El Chayal and Ixtepeque obsidian; thus, central Mexican connections were not expressed in the ritual use of thousands of obsidian artifacts. Rather, elites may have been “gifted” these assemblages by local crafters as a sign of alliance or some other social connection. In terms of “ritual finance,” the use of these materials – which embodied extensive labor and time investment as well as the importance of obsidian for the broader population – provides the opportunity to materialize and negotiate the values of a larger population through the ritual action (Graeber 2001:45; Wells 2006). Here value is not measured in supply and demand, but rather through shared activity during significant events surrounding the death and interment of seemingly royal individuals. Those sharing in these rituals through providing their materials could have elevated their station in life, while honoring the deceased’s authority.

Local Market Exchange and some Implications for Caracol’s Flaked Stone Crafters

Even though an itinerary approach emphasizes that we discover and assess the route, a consideration of the human agents involved is necessary. As obsidian is circulated in and out of markets or non-market exchange along a particular route, those that crafted and transformed raw materials into finished objects certainly were affected. What can we infer about the status or social position of obsidian crafters at Caracol based on the supported market exchange model? In trying to answer this question, I do not aim to discover the specific identity of obsidian crafters, but rather to situate them among a current understanding of lithic production at Caracol. Does obsidian distributional data allow obsidian crafters to occupy the same kind of social position like that of other stone crafters at Caracol? As noted earlier, no obsidian workshop has been found to date at the site and no data have yet demonstrated that obsidian crafting took place close to or within the city center, like some recovered examples of chert lithic production (Johnson 2008).

Given the data collected thus far regarding lithic craft production through various analyses of domestic secondary lithic deposits (Pope 1994, Jones 1996, Johnson et al. 2015), the current understanding of Caracol domestic craft production appears to follow that of Hirth (2006, 2009), where households were involved in a form of “intermittent” and “multi-crafting” organization (see also Shimada 2007). Hirth (2006:276) defines both:

> *Intermittent crafting* is, when craft activity is carried out within the household on a periodic or part-time basis alongside, or as a secondary feature of, other subsistence activities. *Multi-crafting* is, “…where multiple crafts are practiced within the same household.

A major difference, as Hirth (2006:276) describes, is that multi-crafting household’s emphasis a greater “commitment to, and reliance on, craft production for a large proportion of the household’s subsistence needs.” At Caracol, multi-crafting households could include those households that were not immediate land owners or that did not possess the ability to produce the bulk of their own food. These households could have traded crafts at local markets to obtain food stuffs. Notwithstanding, terraced agricultural land is widespread at Caracol (A. Chase and D. Chase 1998; D. Chase and A. Chase 2014) and it is not fully clear how intensive lithic producers articulated with property ownership or food production.

Most of the evidence for intensive craft production at Caracol is visible through incomplete traces (Johnson et al. 2015) as opposed to other sites (Aoyama 2007). But, based on the data thus far, intensive lithic domestic craft production was common at multiple loci without regard to proximity to “downtown” Caracol (Johnson et al. 2015:79, Figure 1; A. Chase and D. Chase 2015). Intensively studied chert producers were involved in the manufacture of chert blades (Johnson 2008; Johnson et al. 2015; Jones 1996; Pope 1994) and potentially used these tools to also modify other materials, such as shell (Pope 1994). These data support a multi-crafting like model where chert blades were crafted as a “contingent” tool used in the broader production of other types of crafts (Johnson et al. 2015).

Some of these households appear to be situated within neighborhood units (e.g., A. S. Z. Chase 2016). Smith (2010:139) defines a neighborhood as, “a residential zone that has considerable face-to-face interaction and is distinctive on the basis of physical and/or social characteristics.” I would add that this kind of organization unit provides much in the way for the potential to share and cooperate.

If we position flaked stone crafters generally, and obsidian crafters, in particular, within an “intermediate” or “multi-crafting” model where (1) living spaces are clustered, (2) thereby offering significant face-to-face interaction and the potential for sharing technical knowledge or “legitimate peripheral learning” (i.e., communities of practice, see Lave and Wenger 1991), then obsidian crafters may have been integral to and integrated within Caracol society. One line of evidence that supports this multi-crafting and integrative model and “communities of practice” perspective is the sharing of techniques used to reduce both chert and obsidian via a pressure technique (Johnson et al., 2015, Johnson and Johnson 2016). However, without the actual workshops, this remains an untested model.

Crafters certainly provisioned city center elites, as can be seen in the deposition of thousands of obsidian blade-production artifacts above at least three vaulted tomb chambers. However, when markets are considered (which enabled crafters to provision nearly the entire population), marketplaces introduce another locus (i.e., in addition to inter-household communication) for the possible sharing of crafting knowledge. Crafters situated within close proximity to their neighbor, as well as acting through markets, to provision the population could be seen as essential agents in the reproduction of the domestic economy. Edge-damage on blades show they were extensively used as “contingent tools” to modify other materials (e.g., bone and shell). Also, obsidian is commonly recovered from a wide assortment of ritual contexts (see Chapter 5 and 6): thus, crafters were also integral for the reproduction and materialization of household ritual expression.

Summary

The reality of ancient Maya exchange is that multiple forms of exchange likely existed coevally; meaning that interpersonal exchange also happened apart from markets, but at least at some sites, markets appear to be the dominant mechanism for household provisioning. Distributional data, as presented above, supports this assertion at Caracol. Now, with the advent of greater amounts of data – from multi-decade long projects which sampled ancient Maya residential groups similarly during each field season – archaeologists can better understand which forms of exchange appear predominant and which materials were subject to particular modes of exchange (e.g., Masson and Freidel 2012). Crafters were certainly affected by different kinds of negotiations and future research at Caracol is expected to put a greater emphasis on this dynamic.

Another segment of obsidian's itinerary is revealed as it moves from workshops to markets and, then, to household consumers. Analysis of this segment or stage allows inferences to be made that aid in revealing the types of social relationships that involved craft producers in the exchange of both products and knowledge. The resiliency of this network is contingent on their ability to access raw materials, transform them into desired objects, and access a space from where they could circulate their crafts to consumers.

CHAPTER 7
QUOTIDIAN AND RITUALIZED USE OF OBSIDIAN AT CARACOL'S RESIDENCES

Summary of the Recovery Contexts for Obsidian

Chapter 6 discussed the general distribution of obsidian at Caracol to infer the dominant form of exchange during the Maya Classic period. Chapter 7 elaborates further on these distributions to better describe the nature of obsidian use after a household had already procured material. It establishes another stage through which obsidian traveled during its existence. For reference, Table 7-1 presents a summary of artifact data by context.

Table 7-1. Summary counts of types of obsidian artifacts by context and percentages of total analyzed.

Type by Context	Refuse/Constr. Fill		Burial		Cache		Totals	% of Total
	n=	*%*	*n=*	*%*	*n=*	*%*		
Macro core shaping	27	0.66	354	2.68	37	6.07	418	2.34
Percussion debitage	9	0.22	1,347	10.21	6	0.98	1,362	7.62
Initial-series blades	183	4.51	3,795	28.76	30	4.92	4,008	22.43
Final-series blades	3,393	83.55	3,155	23.91	243	39.84	6,791	38.01
Other blades	4	0.10	27	0.20	2	0.33	33	0.18
Rejuvenation debitage	55	1.35	2,040	15.46	44	7.21	2,139	11.97
Blade-cores and blade-core frags	56	1.38	458	3.47	235	38.52	749	4.19
Non-blade-core related objects	42	1.03	7	0.05	5	0.82	54	0.30
Undiagnostics	292	7.19	2,014	15.26	8	1.31	2,314	12.95
Totals	4,061	100	13,197	100	610	100	17,868	100

This chapter covers two broad topics. First, the quotidian nature of obsidian tool use at residential groups is shown by summarizing obsidian artifacts that exhibit macroscopic wear patterns. Retouched artifacts are also summarized, and a summary of probability statistics on different artifact types from refuse or construction fill contexts is presented to better contrast quotidian obsidian use with those obsidian objects used in ritual contexts. Probability testing was performed, following Drennan (2010:156-157), and calculated at the 95% (*p=0.05)* confidence level. These probabilities were first introduced in Chapter 5.

Second, I revisit the diversity of obsidian recovered from ritual caches and human burials. Attempts are made to elaborate on the contextual analysis that was preliminarily presented in Chapter 5. From this analysis and the use of statistical probability, the intentional ritualization of obsidian can be highlighted. For example, I present the statistical likelihood of finding retouched exhausted blade-cores (e.g., eccentrics) in caches. In addition, I present the likelihood of finding refits within these same types of ritual deposits. A brief description of refits is also provided. The discussion of refits informs regular acts to destroy, terminate, or "kill" exhausted blade-cores. All these data may be combined to develop a complex model of workshop management and the use of obsidian by non-obsidian crafters to reproduce and materially express their ritual and quotidian life. At the end of this chapter, I return to object itinerary and the concept of "bundling." as proposed by Keane (2005) and initially discussed in Chapter 2 to explore potential reasons why some objects were ritualized with greater frequency over others.

Evidence of Quotidian Tool Use

Below I summarize the obsidian tool assemblage by technological type. I begin with macro debitage that has edge use-wear damage and conclude this section by demonstrating that the vast majority of household obsidian tools were utilized blades. Other non-blade tools do not represent a significant percentage of utilized obsidian. The summary of quotidian tool use is generally descriptive and attempts to preliminarily imply tool function (i.e., working hard or soft materials), except for when some tools may have been used as drills or as scrapers. Future research aims to assess micro-abrasions on a sample of the tools provided below. A future micro-use wear analysis would amplify household activities that involved obsidian tools. Better still, micro-use wear studies should compare obsidian to chert blade tools.

Since 1985 the Caracol Archaeological Project has recovered a substantial sample inventory of residential refuse/fill materials. These are sometimes recovered from excavations between residential structures, but more often are recovered construction fill contexts from within mounded (built) architecture. The obsidian artifacts described below are a summary of the tools recovered from these secondary refuse deposits.

Macro percussion debitage tools include two notched flakes, one edge-rounded flake, one possible projectile point base, and three flakes that exhibit edge damage on one or more margins. Other percussion debitage was also used as tools (Table 7-2).

Table 7-2. Summary of utilized percussion rejuvenation debitage artifacts from refuse/construction fill (non-special) deposits.

Tool type / technology	n=	Avg. max length (mm)
Disk	1	15.06
Platform prep flake	1	15.06
Edge-modified tool	12	21.75
Core section flake	1	33.42
Indeterminate rejuv debitage	5	19.21
Lateral core rejuv	1	17.14
Platform prep flake	5	21.25
Inlay	1	13.04
Indeterminate core-top fragment	1	13.04
Notched, fragment	1	13.92
Distal orientation flake	1	13.92
Scraper, notched, hafted	1	16.99
Pecked ground core-top fragment	1	16.99
Total	16	

Obsidian polyhedral blade-cores were also utilized as tools and it is likely that those included in caches – those that were notched or otherwise retouched – may also have been used as some sort of tool prior to deposition. Notches are usually lateral and exhibit many step fractures. These step fractures could have been a result of use on a harder surface or have resulted from intentional edge dulling. Micro-use wear studies would provide an opportunity to better understand whether or not notched blade-cores, although ritually significant, also served another function prior to their deposition in caches or burials. Future use-wear studies would provide an opportunity to compare these non-ritually associated tools to those recovered from ritual deposits. Table 7-3 summarizes those utilized blade-cores from non-ritual deposits.

Table 7-3. Summary of utilized blade-core artifacts from refuse/construction fill (non-special) deposits.

Technology / tool type / part	n=	Avg. max length (mm)
Blade-core frag (non-rejuv)	1	28.77
Edge-modified tool	-	-
Medial/lateral	1	28.77
Object from blade core frag	2	16.03
Edge-modified tool	-	-
Medial/lateral	1	20.45
Proximal/ lateral	1	11.62
Objects from exhausted core	5	41.06
Biface	-	-
Proximal/medial	1	57.92
Edge-modified tool	-	-
Medial/lateral	1	32.06
Proximal/lateral	1	35.66
Lip plug	-	-
Medial	1	18.79
Uniface	-	-
Complete	1	60.91
Total	8	

Non-blade-core related artifacts and debitage includes 42 objects, only 12 of which show evidence of use-related attributes (Table 7-4). The remaining 30 artifacts are either pressure flakes (n=1) or biface thinning flakes (n=29). These flakes do not appear to have been utilized after their removal from a biface or point.

Table 7-4. Summary of non-blade-core related artifacts from refuse/construction fill (non-special) deposits.

Tool type / part	n=	Avg. max length (mm)
Biface	2	20.34
Medial	1	21.85
Proximal	1	18.84
Point	9	32.79
Complete	1	51.9
Distal	3	25.81
Medial	4	31.79
Proximal portion	1	38.61
Scraper	1	29.04
Distal	1	29.04
Total	12	

Utilized final-series pressure blades are presented last since they make up the bulk of utilized tools from non-ritual deposits at Caracol. These tools are commonly recovered from construction fills and/or refuse deposits associated with household activities. Given the nature of archaeological sampling – test pits, axial trenches, and aerial exposures – the vast majority of these tools are recovered from the front (i.e., plaza construction levels), middle (i.e., construction fill matrix), and backs of structures. A total of 3,392 blades were analyzed for macroscopic use-related wear (e.g., edge-damage or retouch). A total of 2,107 final-series blade artifacts exhibit these types of wear (Table 7-5). Twenty-five additional blade tools are initial-series blades and were not included in the table. Analysis attributes recorded edge-damage on multiple areas (proximal, medial, and distal) and recorded whether or not damage was unilateral or bilateral. While most of the edge-damage recorded on blade tools was done through extensive use, some did exhibit intentional retouched margins. Appendix H, shows that where retouch was semi-invasive (coded as “1”) or invasive (coded as “2”), these tools were described as points (n=2), hafted tools (n=3), drills (n=6), and notched and/or resharpened blades (n=67). No edge angles were recorded during the analysis, but future micro use-wear will record edge angle, as well as micro-abrasions, to better assess tool function and household tool use behavior.

The data on utilized blades show that 1,367 (or 65%) are utilized medial fragments and that the majority of those (n=1,230, or 90%) are bilaterally worked along the entire length of each margin (i.e., bilateral prox/med/dist). These observations suggest that blades were used to their maximum capacity before being discarded. These medial portions, like proximal blade portions would have provided very adequate cutting edges while still being resilient or rigid enough to withstand the force of scraping and/or cutting. These edges were also robust enough to be retouched if resharpening was necessary. Proximal and medial portions could also be retouched or notched bilaterally in order to insert them in a haft. In contrast, utilized distal blade fragments make up a small percentage of the tool assemblage (n=48, or 2%).

Drills (n= 4, or 0.2%) have a defined bit and use-wear consistent with rotation to create and/or widen holes on softer materials, such as bone, shell, or wood. The use-wear on these artifacts appears consistent with that of small chert drills from Caracol. Generically edge-modified tools (n= 2,079, or 98.6%) refer to those obsidian objects that exhibit minor to extensive macroscopic use-wear and/or retouch. This visible wear is typically present on one (unilateral) or more (bilateral) lateral margins. Depending on the completeness of length of the blade, this wear is present in isolated spots along a single margin location (e.g., just proximal or just medial) or can be extensive along the entire length of a given margin (i.e., coded as prox/med/dist). For example, a medial blade segment can exhibit unilateral use-wear on its proximal margin (e.g., unilateral prox). This kind of wear indicates that only this portion was utilized, while the other portions appear sharp and unutilized. Alternatively, an extensively used final-series blade shows bilateral use at proximal, medial, and distal portions (e.g., bilateral prox/med/dist). These blades show no original lateral blade "feather" terminations as each edge is damaged through use or retouch, depending on the tool function or the extensiveness of wear that occurred on the tool prior to its discard.

Hafted-tools (n=3, or 0.1%) are those tools that have intentional bilateral notching where those notches are directly opposite one another. Only one of these is complete, but its form did not justify its inclusion with the drill or point sub-description. The other two are a proximal and a proximal/medial segment. The presence of these segments shows that when the hafting of final-series blades occurred, it appears to have taken place on the proximal or medial portions of blades. These areas of blades are the thickest and most robust. Analysis of the breaks on these two incomplete tools suggested they broke as the blade twisted.

Other tools that exhibit notching are described as "notched blades" and exhibit one or more shallow notches (n= 19, or 0.9%); however, but these are not positioned in such a way to facilitate a haft into a shaft to for a composite tool. Lastly, some final-series blades were formed into small points or those objects that exhibit unifacial or bifacial retouch and a hafting element (n=2, or 0.1%). One of these is complete, while the other is a proximal fragment.

The high quantity and probability of recovering final-series blades – those that exhibit uniformity in both their lateral margins and thickness – provides evidence for arguing that these were the most sought after tools for domestic activities. This is not surprising when positioned with other studies of household flaked stone tool industries, but it is the first time that such interpretations can be made for Caracol with descriptive probability statistical methods. Table 7-6 shows the probability of recovering utilized final-series blades and other artifact types from a sample of refuse/construction fill context lots in comparison to other artifact types. Figure 7-1 plots these probabilities and give a statistical error range at the 95% (*p*=0.05) confidence level for each major artifact type.

Table 7-5. Summary of utilized final-series obsidian blades from refuse/construction fill (non-special) deposits.

Tool type / part / location of wear (or retouch)	n=	Avg. max length (mm)
Drill	4	25.0
Distal	1	24.4
Not recorded (n/r)	1	24.4
Med/dist	1	26.8
Bilateral prox/med/dist	1	26.8
Medial	2	24.4
Bilateral prox/med/dist	2	24.4
Edge-modified tool	2,079	25.9
Complete	12	50.3
Bilateral medial	1	51.3
Bilateral prox/med/dist	9	46.4
Unilateral distal	1	71.2
Unilateral medial	1	64.0
Distal	48	21.8
Bilateral medial	1	27.6
Bilateral prox/med/dist	34	21.6
Bilateral proximal/medial	1	22.1
Distal	5	19.5
Distal end	1	26.7
Lateral med/dist	2	26.4
Unilateral prox/med/dist	4	21.6
Med/dist	47	33.4
n/r	1	19.4
Bilateral medial/distal	2	23.8
Bilateral prox/med/dist	36	34.5
Bilateral proximal/medial	1	33.4
Distal	2	25.1
Unilateral distal	2	34.3
Unilateral medial	2	25.9
Unilateral medial/distal	1	60.1
Medial	1367	23.4
N/r	20	36.6
Bilateral (various) mostly prox/med/dist	7	34.6
Bilateral distal	2	22.3
Bilateral medial	16	23.4
Bilateral medial/distal	2	32.8

Table 7-5. Continued

Tool type / part / location of wear (or retouch)	n=	Avg. max length (mm)
Edge-modified tool (continued)		
Medial (continued)		
Bilateral prox/med/dist	1,230	23.5
Bilateral proximal/medial	5	28.0
Distal	5	17.1
Unilateral distal	15	28.7
Unilateral medial	22	21.5
Unilateral medial/distal	1	16.1
Unilateral prox/med/dist	36	21.3
Unilateral proximal	3	31.6
Unilateral proximal/medial	3	21.4
Edge-modified tool (continued)		
Plunging distal	3	18.8
Bilateral prox/med/dist	1	21.9
Unilateral proximal	2	17.2
Plunging medial/distal	2	22.5
Bilateral prox/med/dist	1	20.3
Unilateral prox/med/dist	1	24.7
Plunging overshot	1	21.9
Bilateral prox/med/dist	1	21.9
Prox/med	439	31.4
n/r	2	23.2
Bilateral prox/med/dist	409	31.4
Bilateral proximal	1	23.1
Unilateral distal	8	27.4
Unilateral medial	3	34.8
Unilateral medial/distal	2	33.6
Unilateral prox/med/dist	9	33.7
Unilateral proximal	4	41.1
Unilateral proximal/medial	1	32.6
Proximal	160	23.9
n/r	4	25.5
Bilateral medial	1	35.8
Bilateral prox/med/dist	129	24.6
Unilateral distal	5	25.8
Unilateral medial	6	18.3
Unilateral medial/distal	1	28.4
Unilateral prox/med/dist	11	18.0
Unilateral proximal	2	20.2
Unilateral proximal/medial	1	18.9
Hafted tool	3	26.8
Complete	1	28.2
Bilateral prox/dist	1	28.2
Medial	1	25.3
n/r	1	25.3
Prox/med	1	26.9
Bilateral prox/med/dist	1	26.9
Notched blade	19	27.3
Distal	1	26.6
n/r	1	26.6

Table 7-5. Continued

Tool type / part / location of wear (or retouch)		n=		Avg. max length (mm)
Notched blade (continued)				
Med/dist	1		33.9	
n/r		1		33.9
Medial	8		23.8	
n/r		4		25.9
Bilateral prox/med/dist		4		21.6
Prox/med	9		31.0	
n/r		3		33.8
Bilateral prox/med/dist		6		28.2
Point	2		28.8	
Complete	1		36.5	
n/r		1		36.5
Proximal	1		21.0	
Bilateral prox/med/dist		1		21.0
Total		2,107	-	

Table 7-6. Probability (*p*=0.05) of recovering types of blade production related artifacts from refuse/construction fill (non-special) deposits.

	Refuse/Construction Fill Lots (sample size n=1,584)	
Type	No. of Lots Positive for Obsidian	p=
Macro core shaping	26	1.6 ± 0.51
Percussion debitage	7	0.4 ± 0.26
Initial-series blades	83	5.2 ± 0.91
Final-series blades	1,434	90.5 ± 1.21
Other blades	2	0.1 ± 0.13
Rejuvenation debitage	42	2.7 ± 0.67
Blade-cores and blade-core frags	51	3.2 ± 0.72
Non-blade-core related objects	24	1.5 ± 0.50
Undiagnostics	215	13.6 ± 1.41

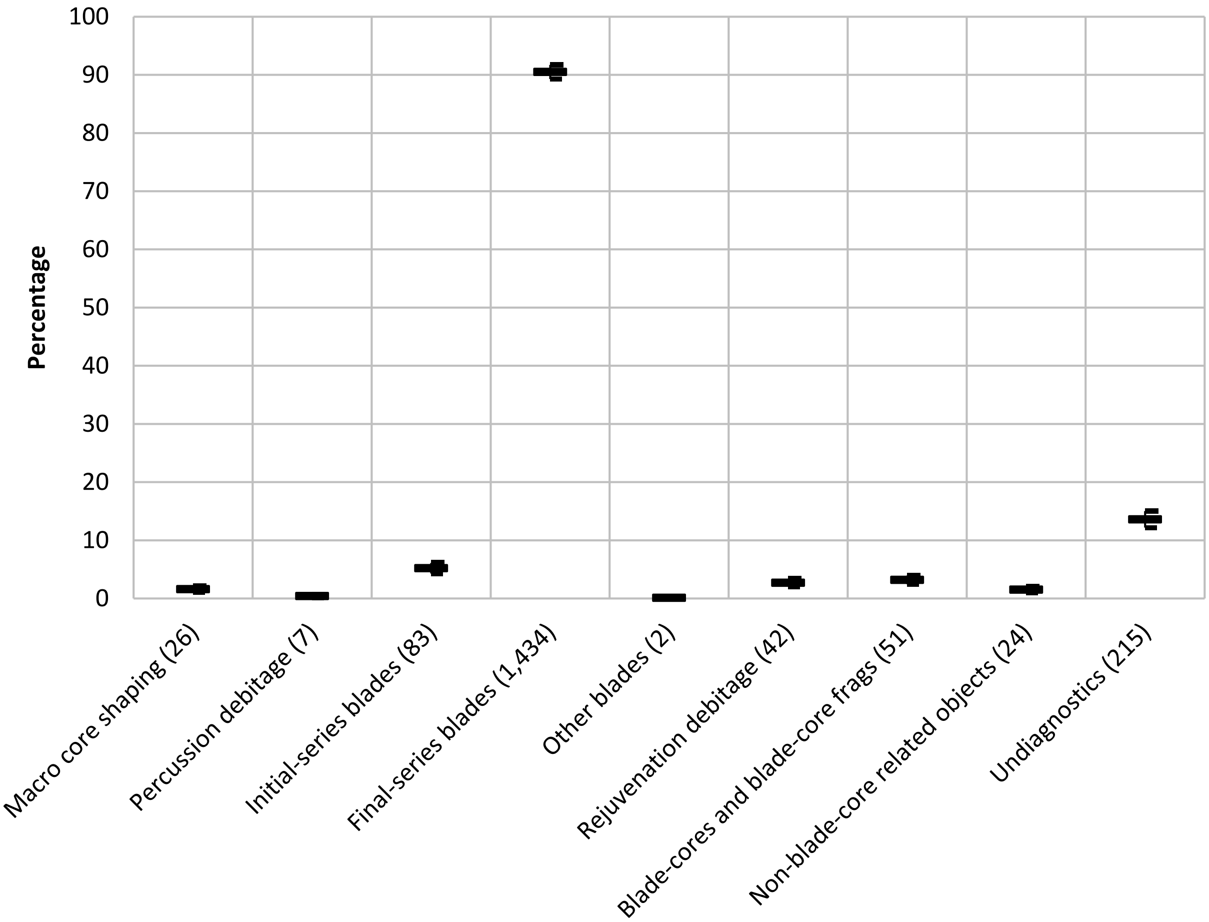


Figure 7-1. Probability (*p*=0.05) plot for obsidian from refuse/construction fill contexts. Sample size is 1,584. Number in parenthesis is number of occurrences from sample.

Obsidian Tools: Observations and Interpretation: Despite a micro-use wear study, macroscopic use-wear shows that 52.8% of obsidian from refuse/fill contexts was utilized (Table 7-7), and most of these (2,107 or 98.3%) were utilized final-series blades. The majority of these blades were utilized medial segments (n=1,367 or 64.8%). When present in refuse/fill deposits only 17.6% of percussion debitage exhibited use-related damage. Two-thirds of these percussion debitage is comprised of generic edge-modified tools were lateral edge damage is present. These tools do not exhibit a form that would allow inference of more specific tool functions, such as scraping. These were likely used as general cutting tools.

Blade-cores appear to minimally be used as tools when present in refuse/fill context (n=8 or 14.3%). When use-wear is visible, blade-cores appear to be recycled into tools for general cutting, and more typically being formed into laterally flaked tools like unifaces or bifaces. Although blade-core retouched and utilized artifacts are present in refuse/fill, it is likely that such finds were once part of a now disturbed cache assemblage. This may also be the case for the non-utilized blade-cores because of the statistical association blade-cores share with ritual caching.

Non-blade-core objects also are present in refuse/fill in similar quantities to that of blade-cores and blade-core fragments. The majority of these (n=11 or 97.9%) are bifacial objects (e.g. points and bifaces); therefore, obsidian points, although few, are present in the archaeological assemblage of Caracol's households.

Table 7-7. Summary of utilized obsidian artifacts from refuse/fill contexts.

	Utilized		Non Utilized		
Type	n=	%	n=	%	Totals
All percussion debitage	16	17.6	75	82.4	91
Final-series blades	2,107	62.1	1,286	37.9	3,393
Blade-cores and blade-core frags	8	14.3	48	85.7	56
Non-Blade-core related objects	12	28.6	30	71.4	42
Other obsidian artifacts	0	0.0	479	100.0	479
Totals	2,143	52.8	1,918	47.2	4,061

In summary, refuse/fill contexts at Caracol do yield all types of obsidian artifacts (see Table 7-1 and Table 7-6), but not all appear to be important for the domestic tool economy. In terms of the obsidian data, final-series blades were the most sought after quotidian tool at Caracol. This interpretation is supported not only in the amount and probability of encountering this type of blade in refuse/fill contexts (see Figure 7-1), but also by the fact that when they are present in refuse/fill, more than half are utilized. Of these utilized final-series blades, it appears that medial segments were utilized with greater frequency that any other final-series blade fragment.

Situating Ritual and the Ritualization of Obsidian at Caracol, Belize

Investigations at Caracol have revealed a significant amount of information regarding household ritual behavior (A. Chase and D. Chase 1994b, 2010:3-15; D. Chase and A. Chase 1998, 2003, 2004, 2009, 2010, 2011). Although a review of all these data and associated interpretations are beyond the scope of this project, I do wish to highlight some relevant examples that emphasize the ritualization of obsidian in both burials and caches. Each of these broadly defined contexts existed as part-and-parcel of normal household activity and identity at Caracol (A. Chase and D. Chase 1994b; D. Chase and A. Chase 1998), and certain caches in particular appear to be timed with calendrical cycles (A. Chase and D. Chase 2013). Obsidian was commonly included in these types of cyclical “offerings” and, thus obsidian, like other materials, help to materialize regular household ritual traditions. Two residential samples and their respective burial and cache assemblages are chosen to illustrate exemplars of ritual behavior. The first is a Late Preclassic to Early Classic example from within the city center and the second is a Late to Terminal Classic example that also shows intensive caching and burials activities but at a more modest sized household located at some distance from city center. The presentation of these two examples is intended to illustrate broad patterns of ritual activities that span from the Late Preclassic until the Terminal Classic.

The Northeast Acropolis is directly east and adjacent to Caana, Caracol’s largest and tallest architectural construction. As neighbors with those potentially living atop Caana, the individuals residing at the Northeast Acropolis were most certainly part of, or somehow affiliated with, the ruling elite. Investigations during the 1994-1995 field seasons explored the eastern structure, B34. An axial trench, Operation C117B (and Operation C117), measuring 12.75-meters east/west by 2-meters north/south explored the area just in front (or west) of the structure as well as the western sloping area and part of the structure's summit (D. Chase and A. Chase 1995; see also Brown 2003:14). The trench was excavated to a depth of 5.5 meters where bedrock was encountered.

These initial investigations recovered 11 caches and seven human interments, two of which were from formally constructed tombs. With the exception of one of a cist burial (S.D.C117B-5), all ritual deposits were dated between Late Classic to Terminal Classic periods. Of the six caches recorded during these investigations, three had obsidian artifacts. During the obsidian analysis, one special deposit, S.D.C117B-2 was designated as a "cache" even though a child's skeletal remains were present. Although included below with the list of caches, it could have readily been assigned to the burial analysis as well. These types of ritual deposits reflect problems in a dual approach to separate burials and caches (see also Becker 1992). Despite this issue, each of these three caches (S.D.C117B-1, -2, -6) included a combination of final-series blades, initial-series blades, rejuvenation debitage, and objects from blade-cores and/or blade-core fragments. Two caches (S.D.C117B-1, and -6) included face cache vessels and over 50 percent of their obsidian assemblage was retouched blade-core fragments or eccentrics (see D. Chase and A. Chase 1998:310-311).

Work undertaken at the Northeast Acropolis during the 2010 field season included the excavation of an intact or partially intact architecture for subsequent stabilization and recovery of on-floor trash from a variety of contexts (see A. Chase and

D. Chase 2010). In addition to these excavations, a test excavation measuring 2-meters by 2-meters was placed in the central part of the plaza directly south and on axis from the northern building and directly west and on axis with the eastern structure (A. Chase and D. Chase 2010:7, 2011). With the eventual expansion of this test excavation with an overlapping 2-meter by 2-meter excavation, S.D.C117F-1 was encountered at an approximately depth of 2.2 meters below the current ground surface. This sealed deposit contained a substantial assemblage of human bone, ceramics vessels, obsidian, and other objects (A. Chase and D. Chase 2010:9-11; 2011). Based on the contents and nature of the deposit, A. Chase and D. Chase (2010:11, 2011) interpret it to be a cremation burial similar to those recorded for Teotihuacán, Mexico. While the burial itself was identified as unusual for the Maya area and stratigraphically and artifactually dating to c.a. AD 330, the artifact inventory also added direct lines of evidence for a non-local affiliation. For example, there was a considerable quantity of green Pachuca obsidian in the form of Stem-B points (see Spence 1996), large lenticular bifaces, and blades (see A. Chase and D. Chase 2010, Figures 10-22, 2011). Because this was a cremation type of burial, most of the obsidian exhibited crazing and some points were bent due to excessive pressure and high heat (Johnson et al. 2010).

In 2015 the Caracol Archaeological Project explored the area in between the 1994-1995 eastern structure and the 2010 central plaza excavations to determine how these two spaces articulated (see A. Chase and D. Chase 2015). During the Operation C205B investigations, measuring 8.9 m east/west by 2.0 m north/south, a series of plaster floors and 10 in situ caches were encountered directly under a 2-meter thick layer of fill containing thousands of ceramics sherds and a vast inventory of other materials (A. Chase and D. Chase 2015a:15). A. Chase and D. Chase (2015a:14-18, see also 2015a:70-91, Figures 37-56) situate the ten ritual special deposits temporally:

> A total of 10 caches were found either cut through or sealed by the lower plaza floorings (Figures 42, 48, 51, 54, 55). Based on the stratigraphic relationships of the floors, four of these caches date to before the placement of the Teotihuacán-related deposit [S.D.C117F-1] and 6 dates to after the placement of this deposit. These caches indicate that finger bowls and eccentric obsidians were in ritual use by the middle of the Early Classic period.

As early as the middle of Early Classic (c.a. A.D. 150, or certainly before A.D. 330) both obsidian blades and shaped exhausted blade-cores (i.e., eccentrics) were ritualized (A. Chase and D. Chase 2015a:14). The ten caches, some of which predate A.D. 330, included: two caches with obsidian blades, human phalanges, and finger bowls (S.D.C205B-1, -8); one lidded vessel with human phalanges, but no obsidian (S.D.C205B-2); four finger bowl caches with human phalanges, but no obsidian (S.D.C205B-3, -6, -7, -10); one finger bowl cache with obsidian, but no human phalanges (S.D.C205B-4); one finger bowl cache with one with obsidian eccentrics, finger bowls, and human phalanges (S.D.C205B-5); and finally one cache with only obsidian eccentrics (S.D.C205B-9) (see A. Chase and D. Chase 2015a:16-18 for a complete inventory). Of the ten caches, four included obsidians.

Although these most recent finds are not directly included in the cache analysis due to time constraints, the investigations at the Northeast Acropolis demonstrate that early ritualization of obsidian in both burials and caches took place at larger, potentially royal, residential compounds directly adjacent to Caana – Caracol's largest structure in the center of the site. These traditions, less the green Pachuca obsidian, are a fairly common occurrence during the Late Preclassic through Terminal Classic periods throughout the residential settlement as well.

In contrast to city center ritual activities that included obsidian, many of Caracol's typical residential plazuela settlement groups also exhibit similar practices that seem to continue this earlier city center tradition later in time and at a similar scale. One noteworthy example among many, dating to the Late Preclassic through Terminal Classic, is the many caches and few burials from the eastern structure K26 at the "Zumba" Group (Operation C189B). This larger residential group is located about 1km to the southwest of the site's city center and has at least six raised mounds atop its basal platform. Although a small sample of ceramic artifacts from a Terminal Classic period tomb dated to the Early Classic, the majority of ritual activity at this residence occurred during the Late to Terminal Classic (A.D. 550 – 900) (A. Chase and D. Chase 2012a:13-14). A. Chase and D. Chase (2012a:14) state, "…our best guess is the [Early and Late Terminal Classic] tomb materials may represent re-collected ritual materials from construction projects in the vicinity of the Zumba residential group."

The axial trench through Zumba's eastern structure measured 7.2-meters east/west by 2.0-meters north/south and recovered fourteen special deposits (A. Chase and D. Chase 2012a:13-18 and 80-129 Figures 39-83). These fourteen special deposits included: two caches that included cache vessels, including finger bowls and lidded vessels, with obsidian (eccentrics and blades) and a host of other local and non-local materials (S.D.C1 and S.D.C9); three cache deposits with different types of vessels, but no obsidian (S.D.C2, S.D.C3, and S.D.C5); two face cache deposits with obsidian eccentrics (S.D.C4, S.D.C13); two finger bowl caches with no obsidian (S.D.C8 and S.D.C10); a face cache deposit with obsidian eccentrics, shell, and jadeite (S.D.C6);

one tomb human burial with eight interred individuals, obsidian blades, one obsidian inlay piece, and a host of other artifacts (S.D.C7); and finally three simple burials neither of which contained obsidian (S.D.C11, S.D.C12, and S.D.C14) (A. Chase and D. Chase 2012a:13-18). Taken together, there appears to be an association of obsidian eccentrics – those obsidian objects that *are not usually blades* – accompanying, either inside or outside, caches and cache ceramic containers (sometimes also found in other residential groups; see Jaeger 1991, Op C59). Many of these types of caches are larger lidded vessels (serving as containers for objects), some of which have appliqued faces and other features that frame facial elements, while other caches do not include ceramic vessels or any vessel(s) large enough to contain obsidian objects. Burials from the eastern building at Zumba do not contain obsidian eccentrics, but rather, when obsidian is present, individuals were interred with obsidian blades, some of which are complete, while others are fragments. This practice is supported with a larger sample size as well (see below).

Given these two examples, the importance of rituals that included obsidian should be apparent. To further emphasize the occurrences and nature of ritualized obsidian usage, I summarize a sample of obsidian from caches and burials separately from some 88 eastern shrine structures – those structures commonly used to inter the dead and deposit ritual caches. Explicitly, I present obsidian inventories of 61 caches and 124 human burials. Included in the burial analysis, I present the obsidian inventory of three above tomb deposits. These were initially described in Chapter 3.

The below summaries are intended to better understand and potentially discover the particularities of how and which obsidian objects were commonly ritualized.

Likewise, through understanding these potentially regularized behaviors, archaeologists can better inform discussions of a shared ritual identity across a landscape (D. Chase and A. Chase 2011). This shared ritual identity can be seen and further reinforced through an analysis of probability statistics and therefore aid in modeling normally ritualized obsidian objects. Because of standardized sampling at most eastern shrine structures, Caracol provides a unique opportunity to address how obsidian was used in potentially hundreds of ritual activities.

Finally, after summaries of burials and caches, I discuss a major implication of provisioning ritualized obsidian by comparing known obsidian workshop inventories from both Maya and non-Maya sites. These comparisons suggest local Caracol obsidian crafters managed nearly all of their blade production by-products in order to provision local rituals. In other words, when the contextual analysis of burials and caches is paired with the technological/typological analysis (i.e., artifact typologies) and the associated implications for local crafters, the fractal nature of obsidian movement receives greater emphasis.

Ritualized Obsidian from Caracol's Caches

As I have described generally in Chapter 5 and will show in greater detail in this section, the caching of obsidian was a continued practice at Caracol and that this practice dates to as early as the middle of the Late Preclassic *and* was not exclusive to elite residences located in or near the city center (see Figure 5-9). As a way to introduce the next section that presents an obsidian inventory of 61 caches, two other residential examples are described to illustrate the diversity of the kinds of caches that contain obsidian. While I do not analyze the kinds of obsidian artifacts by cache types per se (e.g., eccentrics blade-cores in face caches or blades with finger bowl caches), the research does present the diversity of obsidian inventories from caches to begin to better understand which objects are most commonly ritualized as part of a cache event.

Caches that contain obsidian do vary in type. In addition to the caches described above, two examples show the general diversity of caches that include obsidian. One example demonstrates that vessels are not necessarily included during the ritualization of obsidian, while a second shows the association of face caches with ritualized obsidian. Investigations at southern eastern structure, C21 (Operation C179D), from the “Culebras” group recovered a cache that was deposited without a ceramic vessel. The “Culebras” group is approximately 150 meters east of the South Acropolis which anchors the southern part of the city center (A. Chase and D. Chase 2008:6-7). A. Chase and D. Chase (2008:11-12) describe this cache as follows:

> S.D. C179D-1 (Figures 32, 33, and 34) was a very impressive cache deposit placed within the earlier plaza fill in front of Structure C21. Even though placed directly into the dirt plaza fill, the artifacts were embedded in what is colloquially referred to as "cache dirt;" this cache dirt was full of small chips of valuable materials. In the case of S.D. C179D-1, the cache dirt consisted of 747 jadeite chips and 4751 spondylus chips. Also recovered within the cache dirt were 23 chert chips, 32 quartz chunks, 4 obsidian blade fragments, 2 unworked shells, and 138 slate mirror pieces; the scattered distribution of the slate mirror pieces suggests that they did not constitute a single artifact. The central elements of the cache consisted of a jadeite bead (Figure 34aa), a hard stone ball (Figure 34z), and a lump of brain corral (Figure 34g) overlaid by 3 chert eccentrics (Figure 34a-c). Distributed about the chert eccentrics were 8 obsidian eccentrics, 2 obsidian lancets, 6 complete spondylus shells, and 3 stingray spines. As 52 "fish vertebrae" were also recovered, it may be that the 3 stingray spines really represented 3 complete rays, as is noted for other caches at Caracol (Teeter and Chase 2004). S.D. C179D-1 dates to the Early Classic Period and contains the first chert eccentrics recovered at Caracol in 24 years of research.

Also close to the city center, excavations at the “GRB Group about 170 meters to the northwest of Caana explored ritual space. An axial trench measuring 12.05-meters east/west by 2-meters north/south was explored the eastern structure, Structure I5. As series of ritual events were recorded during these excavations (see A. Chase and D. Chase 2007a:9-12; Johnson et al. 2015:116, Figure 2). In total thirteen ritual deposits were encountered. Of these five were human interments, five caches without obsidian, and three were caches with obsidian. One of these caches with obsidian was designated S.D.C177D-9) and consisted of two face caches, more than 30 obsidian eccentrics, jadeite beads, whole marine shells, stingray spines, and miscellaneous faunal bone (see A. Chase and D. Chase 2007a:11; Johnson et al. 2015:118, Figure 4). Each of these face cache vessels and the area outside of them contained retouched blade-cores and other obsidian objects, such as overshot blades and lateral blade-core margins. Refits among this special deposit cache assemblage were also present, demonstrating that some exhausted blade-cores were laterally flaked and then the remainder of the core was laterally notched.

Both of these examples show impressive artifactual assemblages and at least two cache types where obsidian is commonly recovered. Future research would benefit from an analysis of cache type and the type of contents each type may have, but the examples presented thus far should help to present the diversity in caching practices and the breadth of other materials, most of non-local, that accompany ritualized obsidian objects.

The analysis of obsidian from 61 of Caracol's caches shows that most contain final-series blades (n=41, or 67.2%) followed by blade-cores and/or blade-core fragments (n=31, or 52.5%). Table 7-8 presents the obsidian inventory from those caches that contain obsidian. Other caches have been recovered, but a complete list and comparison between those that contain and do not contain obsidian is beyond the scope of this research. The immediate goal of the cache analysis was to determine which obsidian objects are typically recovered from caches. Table 7-9 shows the number of caches that contain particular types of obsidian artifacts. This table also presents probability statistics which helps to better estimate the likelihood of finding certain objects; Figure 7-2 shows these probabilities with their associated standard errors. A few patterns are evident from the analysis of these probabilities. The probability of recovering blade-cores (and fragments) (i.e. eccentrics) is almost equal to finding cached final-series blades. Both core shaping and core rejuvenation debitage also have a significant presence in caching activities. Small percussion debitage is less likely to occur in caches, as is initial-series blades and non-blade-core related objects (e.g., points). Undiagnostic debitage is similar to rejuvenation debitage in terms of being cached and a cursory look at these indeterminate flakes and flake fragments shows that they could be likened to small fragments of jadeite or shell that are included as "cache dirt" (see A. Chase and D. Chase 2015a:20: D. Chase and A. Chase 1998). What is apparent from this analysis is that every dominant obsidian artifact type was ritualized during caching activities; however, there was a greater emphasis on including final-series blades and retouched and/or destroyed exhausted blade-cores and blade-core fragments in caches.

Table 7-8. The presence (✓) or absence (-) of blade production and non-blade production artifacts from 61 cache contexts. Note that the general reduction sequence is left to right for blade production. Each context is labeled with its unique special deposit of S.D. number.

Cache Special Deposits	Blade Production								Non-Blade-Core Related Objects and Undiagnostic Debitage						
	macro debitage	percussion debitage	final series blade	initial series blade	rejuvenation debitage	exhausted core (frag)	core fragment (?)	misc. blade artifacts	chunk	modified flake	flake (fragment)	various debitage	adornment	pebble	point
SDC3C-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC3C-5	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC4C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC4C-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC4E-2	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC4E-3	-	-	✓	-	-	✓	-	-	-	-	✓	-	-	-	-
SDC4E-5	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC4E-9	✓	-	✓	-	✓	✓	-	-	-	-		-	-	-	-
SDC4F-1	-	-	✓	-	-	✓	-	-	-	-	✓	-	-	-	-
SDC6B-4	✓	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC18G-1	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-
SDC32C-1	-	-	✓		✓	✓	-	-	-	-	✓	-	-	-	-
SDC32A-2	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-
SDC39B-2	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDC39B-3	✓	-	✓	-	✓	✓	-	-	-	-	-	-	-	-	-
SDC39B-5	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC45B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC49D-4, -5	2015 FIELD SEASON DATA BEING TABULATED (NOT INCLUDED IN ANALYSIS)														
SDC59A-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC63A-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC64B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC65A-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC68A-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC70B-2	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-
SDC71E-2	✓	-	✓	-	✓	✓	-	-	-	-	-	-	-	-	-
SDC71E-3	-	-	✓	-	-	✓	-	-	-	-	-	-	-	-	-
SDC73B-1	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC85C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC86C-3	✓	-	✓	-	✓	-	-	-	-	-	-	-	-	-	-
SDC95C-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-

Table 7-8. Continued

Cache Special Deposits	Blade Production								Non-Blade-Core Related Objects and Undiagnostic Debitage						
	macro debitage	percussion debitage	final series blade	initial series blade	rejuvenation debitage	exhausted core (frag)	core fragment (?)	misc. blade artifacts	chunk	modified flake	flake (fragment)	various debitage	adornment	pebble	point
SDC98B-1	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC109B-1	-	-	✓	-	-	✓	-	-	-	-	✓	-	-	-	-
SDC116C-1	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC116C-2	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC117B-1	-	-	✓	-	-	✓	-	-	-	-	-	-	-	-	-
SDC117B-6	-	-	✓	-	✓	✓	-	-	-	-	-	-	-	-	-
SDC117B-2	-	-	✓	✓	✓	✓	-	-	-	-	✓	-	-	-	-
SDC118F-6	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	
SDC121C-1	-	-	-	-	-	✓	-	-	-	-	-	-	-		
SDC140G-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC177D-1	-	-	✓	-	-	✓		-	-	✓	-	-	-	-	-
SDC177D-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC177D-7	✓	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-
SDC177D-8	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-
SDC177D-9	-	-	✓	✓		✓	-	-	-	-	-	-	-	-	-
SDC178C-1	✓	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC179D-1	-	-	✓	-	✓	✓	-	-	-	-	-	-	-	-	-
SDC184B-4	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-
SDC184B-5	✓	✓	-	-	✓	✓	-	-	-	-	-	-	-	-	-
SDC188B-1	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC188B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC189B-1	✓	-	-	-	✓	✓		-	-	-	✓	-	-	-	-
SDC189B-13	-	-	-	-		✓	✓	-	-	-	-	-	-	-	-
SDC189B-4	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDC189B-6	✓	-	✓	-	-	✓	-	-	-	-	-	-	-	-	-
SDC189B-9	✓	-	✓	✓	-	✓	-	-	-	-	-	-	-	-	-
SDC201B-3	-	-	✓	-	-	-	-	-	-	-		-	-	-	-
SDC203B-11	-	-	-	✓	✓	-	-	-	-	-	✓	-	-	-	-
SDC203B-12	-	✓	-	✓	-	-	-	-	-	-	-	✓	-	-	-
SDC203B-19	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-
SDC203B-9	✓	-	✓	✓	-	✓	-	-	-	-	-	-	-	-	-
SDC204B-1	✓	-	-	-	-	-	-	-	-	-	✓	-	-	-	-
SDC205B-1, -4, -5, -8, -9	2015 FIELD SEASON DATA BEING TABULATED (NOT INCLUDED IN ANALYSIS)														

Table 7-9. The estimated probability (*p*=0.05) of recovering different types of obsidian artifacts from cache contexts.

	Cache (sample size n=61)	
Type	No. of Caches Positive for Obsidian	p=
Macro core shaping	17	27.9 ± 9.59
Percussion debitage	3	4.9 ± 4.61
Initial-series blades	8	13.1 ± 7.21
Final-series blades	41	67.2 ± 10.04
Other blades	0	-
Rejuvenation debitage	13	21.3 ± 8.75
Blade-cores and blade-core frags	31	52.5 ± 10.68
Non-blade-core related objects	2	3.2 ± 3.76
Undiagnostics	10	16.4 ± 7.92

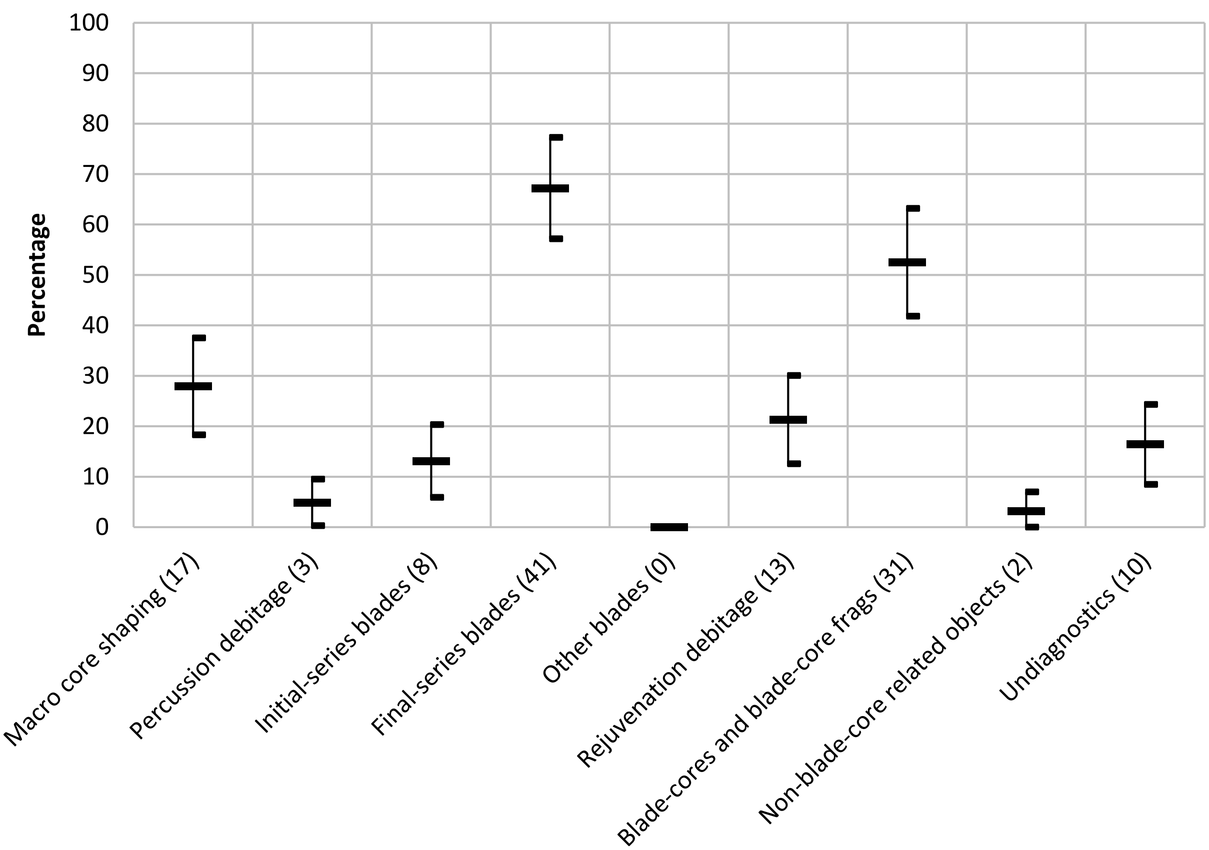


Figure 7-2. The estimated probability (*p*=0.05) for different types of obsidian artifacts from cache contexts. The sample size is 61. The number in parenthesis is number of occurrences from sample.

Because of the probability of finding blade-cores in caches overlaps with the likelihood of recovering obsidian blades, further analysis was conducted to determine whether or not there was a sub pattern within these objects. Of the 61 caches included in the analysis, 30 had at least two exhausted blade-cores or blade-core fragments.

Two general observations are of note in the analysis of blade-cores from the 32 caches (two additional caches from C205B were included). First, most are fragments (n= 67, or 80.7%) and the morphology of the core fragments suggests that they were intentionally destroyed once they were exhausted. Generally, the nature of core destruction can include one or several of the following features: (1) the removal of either or both of the proximal and distal ends (some of these end removal result in deep notching as well); (2) laterally (or bilaterally) flaking the core; (3) often followed by the creation of deeper notches which can be unilateral or bilateral; (4) unifacially or bifacially flaking an exhausted core; and/or (5) medially splitting cores. All of these acts are performed by hard or soft hammer percussion, while techniques used to split cores included indirect percussion and an anvil. It is currently unclear where cores were destroyed, but refit evidence suggests that core destruction may have occurred at the caching residence; chert flaked stone evidence from nearly every residential investigation shows that Caracol's population knew how to knap flaked stone. Alternatively, it may have been performed at the crafting workshop, but this would have created even more fragments that then had to be managed. In either case, a fairly standard practice was followed.

Objects produced as a result of these activities at Caracol include non-uniformly shaped objects or those that resemble an "E", "S", scorpion (or partial scorpions?), uniface or biface cores, or those with proximal and distal notching (Figure 7-3). Interestingly, this last type resembles skate fish egg capsules generally and those specific to the *Dipturus* species of skate fish (see Ishihara et al. 2012:17, Figure 11A). These fish are common to the Atlantic Ocean and Caribbean Sea which boarders the Belizean coast. Skate egg capsules can wash up on the beach and if these are intended to look like skate egg capsules, they would add another dimension to the marine component of some caches (see A. Chase and D. Chase 2007:11, S.D.C177D-9; see also Cunningham-Smith et al. 2014).

Each of these type of core fragments is usually termed as “eccentric”; however, the descriptive morphological attributes and past actions are generally lost when they are termed eccentrics by archaeologists. Because the term eccentric obscures actions to destroy cores with some patterned regularity, the term also disables the opportunity to describe a significant transformative process during a particular stage in the itinerary of some obsidian objects.

Figure 7-3. Sample of modified exhausted blade-cores and a representation of a skate fish egg capsule (sp. *Dipturus*). (A) non-uniformly shaped (also note excessive step-fractures on blade-core platform), C95B/8-1; (B) "E" shaped, C117B/7-17; (C) "S" shaped, C117B/7-28; (D) scorpion shaped, C205B/17-7; (E) partially shaped scorpion? C189B/3-1; (F) partially shaped scorpion? C189B/3-3; (G) uniface, C117B/7-21; (H) biface, C117B/14-8; (I) proximally and distally/laterally notched, C177D/46-33; (J) distally notched, C117D/46-35; (K) distally notched, C177D/46-18; (L) silhouette of skate fish egg capsule at 50% actual size.

Second, and as a result of detailed descriptive study of blade-core fragments and core destruction, it became apparent that a substantial amount of caches with blade-cores had at least one refit with another fragment from the same cache; however, no across cache refits were noticed. This was initially observed during cursory infield analysis and artifact illustration. The summary of refits by cache type is presented in Table 7-10. The nature of refits generally shows that refits include lateral or platform removals that refit with the larger portion of the remainder of a core. Some of these refit pieces show evidence for minor use as well, suggesting that they may have been used prior to their deposition in caches. Further analysis is needed to understand this potential stage of use prior to ritual deposition. The likelihood of finding refits in caches is significant as just about 40 percent of caches with blade-cores contain refits (n=12, or 37.5%). When present, refits most often occur in association with face caches (n=7), but are also associated with undecorated lidded cache vessels (n=2) and caches that do not include a ceramic container (e.g., “no vessel”) (n=3).

The distribution of caches with and without refits is similar in that they are clustered within 1 km or so of the city center; however, those caches without refits are present in the sampled area to the southeast of the city center (see Figure 7-4 and Figure 7-5). These distributional patterns are likely a legacy of sampling bias inherent in the current sample of 61 caches included in this analysis. Further distributional studies with larger sample sizes may reflect general homogeneity of this practice across the entire settlement landscape and, if true, it would continue to reinforce the current market exchange model.

When refits are present, the entire exhausted blade-core is typically not reconstructable. This means that there is usually one or more pieces that would have been curated elsewhere after a core was destroyed or terminated in anticipation of future rituals. Generally speaking, a destroyed blade-core can fragment into two to more than eight pieces depending on the nature of destruction or if there was an intended shape that was to be created as a result of destructive transformation. More work is needed to actually quantify the possibilities, but it is important to mention that there could be as many ritual caches as the number of pieces created during core destruction. Returning to the concept of "bundling," as proposed by Keane (2010), the destruction, deposition of some objects, and intentional curation of others are fractal components that tie or link specific actions and meanings to these kinds of objects. Furthermore, acts of destruction, transformation, and separation or fractality (or keeping together in the case of refits) are part of the ritualization process (see also Hruby 2007 for a discussion of ritual production of obsidian eccentrics).

Table 7-10. The presence (✓) or absence (-) of blade-core and blade-core fragment refits by vessel type in those cache special deposits with blade-cores and/or blade-core fragments (n= 32). Note that one cache special deposit was not included in table below because it was unavailable at the time of refit analysis (S.D.C193-3) and that this table included two additional caches from the 2015 excavations in on axis front of Str. A34.

Caches with whole blade-cores or fragments	ABSENCE of refits by vessel type			PRESENCE of refits by vessel type		
	face cache*	cache vessel*	no vessel	face cache*	cache vessel*	no vessel
SDC3C-5	✓	-	-	-	-	-
SDC4E-2	-	-	✓	-	-	-
SDC4E-3	-	-	✓	-	-	-
SDC4E-9	-	-	-	-	-	✓
SDC4F-1	-	-	✓	-	-	-
SDC32C-1	✓	-	-	-	-	-
SDC39B-3	-	✓	-	-	-	-
SDC70B-2	-	-	-	-	-	✓
SDC71E-2	-	-	✓	-	-	-
SDC71E-3	-	-	✓	-	-	-
SDC73B-1	-	-	✓	-	-	-
SDC98B-1	-	-	-	-	✓	-
SDC109B-1	-	-	-	-	-	✓
SDC116C-1	-	-	-	✓	-	-
SDC116C-2	-	-	-	✓	-	-
SDC117B-1	-	-	-	✓	-	-
SDC117B-2	-	-	-	-	✓	-
SDC117B-6	-	-	-	✓	-	-
SDC121C-1	-	-	✓	-	-	-
SDC177D-1	✓	-	-	-	-	-
SDC177D-9	-	-	-	✓	-	-
SDC177D-7	-	-	-	✓	-	-
SDC179D-1	-	-	✓	-	-	-
SDC184B-5	-	✓	-	-	-	-
SDC188B-1	-	-	✓	-	-	-
SDC189B-1	✓	-	-	-	-	-
SDC189B-6	-	-	-	✓	-	-
SDC189B-9	-	✓	-	-	-	-
SDC189B-13	-	✓	-	-	-	-
SDC203B-9	-	-	✓	-	-	-
SDC205B-5**	-	-	✓	-	-	-
SDC205B-9**	-	-	✓	-	-	-
Total of occurrences	4	4	12	7	2	3

* These vessel types are typically lidded; ** 2015 field season caches added to table but not discussed in text.

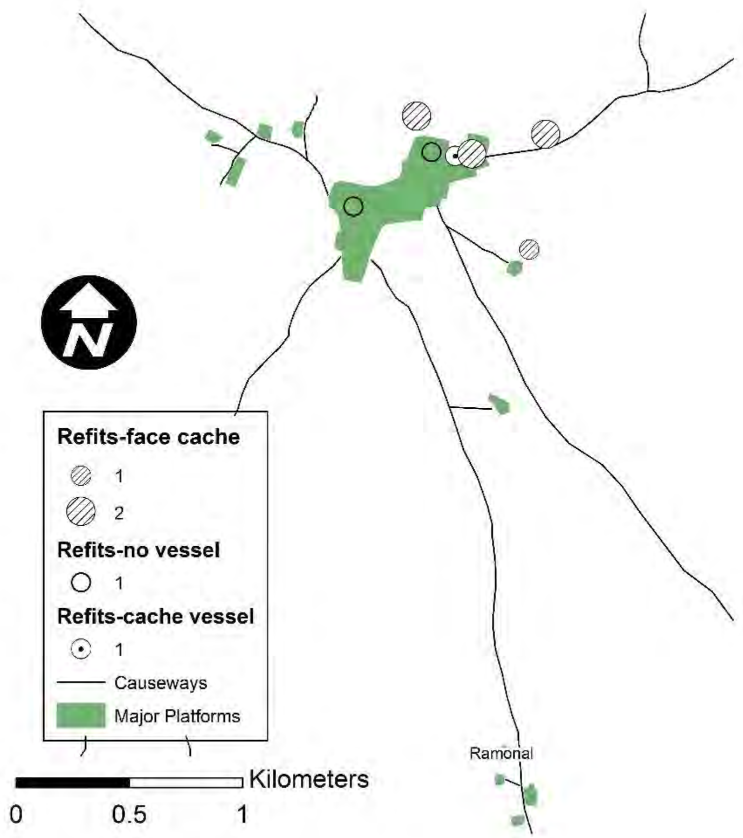


Figure 7-4. Distribution of blade-core refits by cache and vessel type. Note that these are concentrated around the city center.

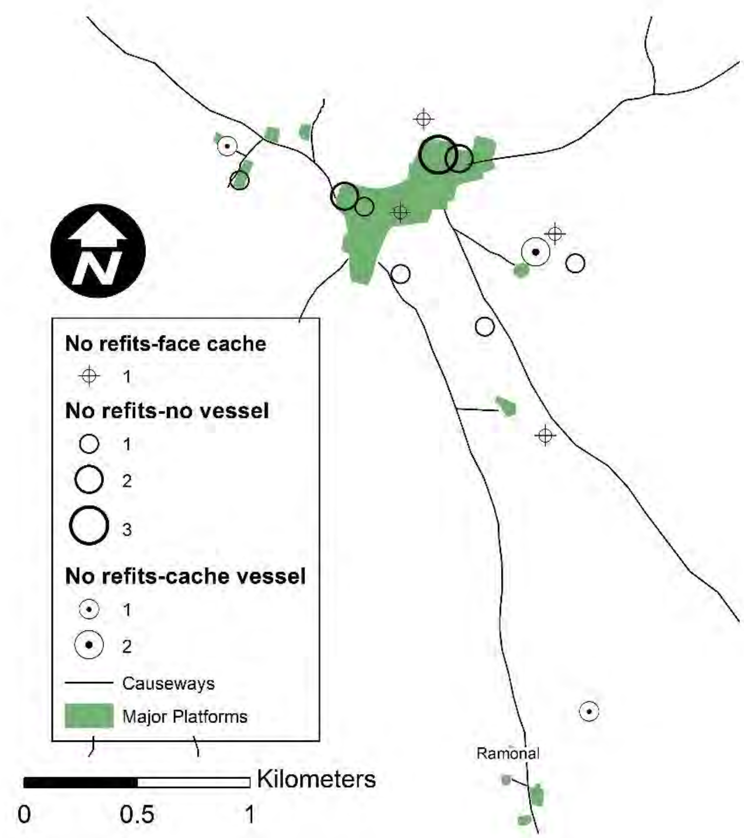


Figure 7-5. Distribution of blade-core without refits by cache and vessel type. Note that these are not exclusively concentrated around the city center.

Ritualized Obsidian from Caracol's Burials

Burials at Caracol take the form of at least four general types. These include simple burials, cist burials, somewhat more elaborate crypts, and the tombs which are most architecturally complex (A. Chase and D. Chase 1987:56-57; D. Chase 1994). Each of kind of burial can have one to multiple individuals and tomb re-entry is common (D. Chase and A. Chase 2011). A. Chase and D. Chase (1987:56-57) describe each of these four types:

> *Simple* burials show no distinct outline. They are often found in construction fill and are frequently assumed to be non-intrusive in nature [i.e., no floor or other intact surface was disturbed during an interment of a simple burial]. *Cists* are prepared areas with clear outlines, marked either by soil changes or by stones. They may be capped and some actually have air space inside; however, there is no formal construction or either walls or roof. Cists are often cut into previously existing constructions. *Crypts* are distinguished from cists in having formal walls and roofs and are generally open-air inside. They vary form tombs in that the side walls are usually composed of either a single line of upright slabs or several courses of smaller stones. These are not much larger than necessary to hold their contents. *Tombs* are formal constructions larger than necessary to hold their contents They are chambers in which there is always enough room to crawl or move about… on two feet.

Obsidian is not a main focus of deposition in residential burials in terms of quantity, but they are commonly recovered alongside human remains and other deposited objects (e.g., ceramics, jadeites, shells, or other shaped stone, like spindle whorls). Table 7-11 shows the presence of obsidian artifacts from 124 burials sampled during the obsidian analysis. Note that while the vast majority of burials have final-series blades (n=112, or 90.3%), a small portion have other obsidian objects, such as eccentrics (see above) and/or bifaces or points (Table 7-12 and Figure 7-6). Although the probability of including exhausted blade-cores, for example, like other non-final-series blades is lower overall, there is some desire to include these with human interments. However, these non-blade objects associate much stronger with caches. It is important to note that analysis of obsidian from burials did not take into account the type of burial that had obsidian, but preliminary observations suggest that those more complex burials (i.e., crypts and tombs) often contain more objects and by association usually include more obsidian.

Table 7-11. The presence (✓) or absence (-) of blade production and non-blade production artifacts from 124 burial contexts. Note that the general reduction sequence is left to right for blade production. Each context is labeled with its unique special deposit of S.D. number.

	Blade Production								Non-Blade-Core Related Objects and Undiagnostic Debitage						
Burial Special Deposits	macro debitage	percussion debitage	final series blade	initial series blade	rejuvenation debitage	exhausted core (frag)	core fragment (?)	misc. blade artifacts	chunk	modified flake	flake (fragment)	various debitage	adornment	pebble	point
SDC1H-2	-	✓	✓	✓	✓	-	-	-	-	-	✓	-	-	-	-
SDC3C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC3C-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC3C-6	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC4C-3	-	-	✓	✓	-	✓	-	-	-	-	✓	-	-	-	-
SDC4H-1	-	-	✓	-	-	-	-	-	-	-		-	-	-	-
SDC5B-1	-	-	✓	-	-	-	-	-	-	-		-	-	-	-
SDC6B-1	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC6B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC7B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC7B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC12A-2*	✓	✓	✓	✓	✓	✓	-	-	-	-	-	✓			✓
SDC19A-2*	✓	✓	✓	✓	✓	✓	-	-	-	-	✓	-	-	-	-
SDC22A-1	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC29A-1	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC29A-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC31B-2	-	-	✓	-	✓	-	-	-	-	-	-	-	-	-	-
SDC32A-1	✓	-		-	-	-	-	-	-	-	-	-	-	-	-
SDC32B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC32C-2	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC33B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC35A-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC36A-1	-	-	✓	-	✓	-	-	-	-	-	-	-	-	-	-
SDC36B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-

Table 7-11. Continued

Burial Special Deposits	Blade Production								Non-Blade-Core Related Objects and Undiagnostic Debitage						
	macro debitage	percussion debitage	final series blade	initial series blade	rejuvenation debitage	exhausted core (frag)	core fragment (?)	misc. blade artifacts	chunk	modified flake	flake (fragment)	various debitage	adornment	pebble	point
SDC39B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC39C-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC39E-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC39E-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC39E-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC39E-5	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC39E-6	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC40A-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC40C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC48A-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC49A-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC49A-4	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-
SDC49A-5	-	-	✓	-	-	✓	-	-	-	-	-	-	-	-	-
SDC49D-1	2015 FIELD SEASON DATA BEING TABULATED (NOT INCLUDED IN ANALYSIS)														
SDC49D-9	2015 FIELD SEASON DATA BEING TABULATED (NOT INCLUDED IN ANALYSIS)														
SDC50A-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓
SDC50B-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC52B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC53B-6	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC56C-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC60B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC60B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC67A-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC67A-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC72B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC73B-2	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC74B-1	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC75B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC79B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC79B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC85C-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC85C-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC85C-5	-	-	-	✓	✓	✓	-	-	-	-	-	-	-	-	-
SDC85C-7	-	-	✓	-	-		-	-	-	-	-	-	-	-	-
SDC86C-5	✓	-	✓	-	✓	✓	-	-	-	-	✓	-	-	-	-
SDC87B-1	-	✓	✓	✓	-	-	-	-	-	-	-	✓	-	-	-
SDC87E-1*	✓	✓	✓	✓	✓	✓	-	-	-	-	✓	✓	-	-	-

Table 7-11. Continued

Burial Special Deposits	macro debitage	percussion debitage	final series blade	initial series blade	rejuvenation debitage	exhausted core (frag)	core fragment (?)	misc. blade artifacts	chunk	modified flake	flake (fragment)	various debitage	adornment	pebble	point
	Blade Production								Non-Blade-Core Related Objects and Undiagnostic Debitage						
SDC88C-1	-	-	✓	-	-	-	-	-	-	-	-	-	✓	-	-
SDC95B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC95C-4	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC95C-6	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC95C-7	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC95C-8	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC98C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC101D-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC102B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC104C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC105C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC117B-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC117B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC117B-5	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC117C-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	
SDC117F-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	✓
SDC118F-4	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-
SDC121C-5	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC124B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC138C-1**	-	-	✓	✓	✓	-	-	✓	-	-	-	-	-	-	-
SDC138C-2	-	-	-	-	✓	-	-	-	-	-	✓	-	-	-	-
SDC143C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC147B-1	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC158B-6	-	-	✓	-	-	-	-	-	✓	-	-	-	-	-	-
SDC164B-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC164B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC164B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC177D-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC177D-6	-	-		-	-	-	-	-	-	-	✓	-	-	-	-
SDC177D-7	-	-	✓	✓	-	-	-	-	-	-	✓	-	-	-	-
SDC179B-7	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC179D-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC180B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC180D-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓
SDC184B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC184B-6	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC184D-6	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-

Table 7-11. Continued

Burial Special Deposits	Blade Production								Non-Blade-Core Related Objects and Undiagnostic Debitage						
	macro debitage	percussion debitage	final series blade	initial series blade	rejuvenation debitage	exhausted core (frag)	core fragment (?)	misc. blade artifacts	chunk	modified flake	flake (fragment)	various debitage	adornment	pebble	point
SDC185B-13	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC185B-4	-	-	✓	-	-	-	-	-	✓	-	✓	-	-	-	-
SDC185C-1	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC186B-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	✓
SDC186B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC186D-1	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC186D-2	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-
SDC188B-8	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-
SDC189B-7	✓	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC193B-2	-	-	✓	✓	-	-	-	-	-	-	✓	-	-	-	-
SDC193B-3	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC194B-2	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-
SDC194B-5	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC195B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC195B-5	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC196B-1	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-
SDC198B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC199B-18	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-
SDC199B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC199B-3	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC200B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC201B-6	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC203B-10	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC203B-14	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-
SDC203B-16	-	-	✓	-	-	✓	-	-	-	-	-	-	-	-	-
SDC203B-2	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC203B-20	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-
SDC204B-4	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-

*One of three above tomb deposits

**A possible fourth obsidian deposits associated with a burial tomb

Table 7-12. The estimated probability (*p*=0.05) of recovering different types of obsidian artifacts from burial contexts. Note that final-series obsidian blades are highly selected for deposition in human burials.

	All Burials (sample size n =124)		Burials – excluding C12, C19, C87 (n=121)	
Type	No. of Lots Positive	%	No. of Lots Positive	p=
Macro core shaping	6	4.8	3	2.5 ± 2.35
Percussion debitage	5	0.4	2	1.7 ± 1.95
Initial-series blades	13	10.5	10	8.3 ± 4.16
Final-series blades	112	90.3	109	90.1 ± 4.50
Other blades	1	0.8	0	-
Rejuvenation debitage	11	8.9	8	6.6 ± 3.74
Blade-cores and blade-core frags	10	8.1	7	5.8 ± 3.52
Non-blade-core related objects	6	4.8	5	4.1 ± 2.99
Undiagnostics	27	21.8	24	19.8 ± 6.01

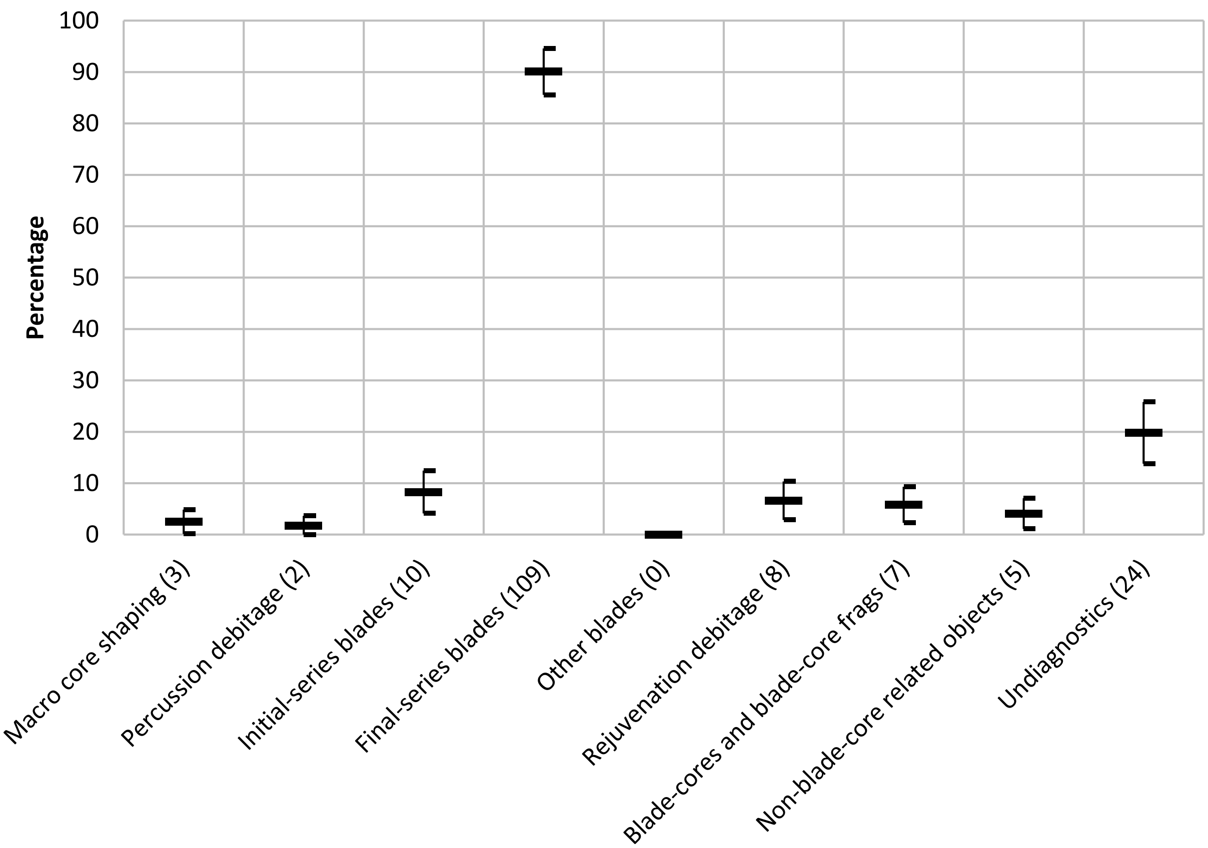


Figure 7-6. The estimated probability (*p*=0.05) for different types of obsidian artifacts from burial contexts. The sample size is 121. The number in parenthesis is number of occurrences from sample.

Obsidian above vaulted tomb chambers: As described in Chapter 3, the bulk of obsidian found at Caracol was recovered from above three vaulted tomb contexts, two of which are within city center monumental architecture and the third is just outside this area. While these three tombs are definitive evidence for larger deposits of obsidian, others may be likely. These other possible deposits are discussed below.

Operation C12A constituted an excavation into the summit of Caracol's Structure A3, the northern structure at Caracol's "A Group" complex. Excavations in the A Group have established that eastern caching rituals may have begun at Caracol as early as A.D. 40 (A. Chase and D. Chase 1987:13, 2006, 2013). Initial construction of the A Group's temples began during the late Preclassic Period, but by the Late Classic Period, pyramidal structures, some more than 20 meters in height enclosed all four sides of a large plaza space where a number of stelae and altars had been erected. During the Late Classic Period Structure A3 would have been elaborately decorated with stucco designs and painted red. Two rooms with a central entrance were built at the summit of the structure. And in one of these rooms, a bench was constructed to cover a tomb that was intruded into the central doorway as shown by a cut in the plaster. The tomb (S.D.C12A-2) was constructed for just one individual and sealed with a series of capstones. One of these capstones was painted with text that included a Caracol emblem glyph and the calendar date A.D. 695. The use of the polity's emblem glyph in association with the burial of this individual has led the principle investigators to argue that this person was a member of Caracol's ruling lineage (A. Chase and D. Chase 1987:15, Figure 10). More than six thousand pieces of obsidian and nearly eight thousand pieces of chert were encountered as excavated neared the capstones. A.

Chase and D. Chase (1987:15) state, “The chert was distributed in several rough lenses throughout the cut, while the obsidian was concentrated above the southernmost capstone for the chamber.”

Operation C19A explored the eastern structure, Structure L3, at the “Machete Group” (see A. Chase and D. Chase 1987:71, Figure 52. The Machete Group is within 1 kilometer of the city center and is a Late Classic period house mound group (A. Chase and D. Chase 1987:40-43). A number of special deposits were found during excavations including crypt burials and a single tomb. The tomb (S.D.C19A-2), like the A3 tomb, had a painted capstone that recorded a date of A.D. 613 (A. Chase and D. Chase 1987:43, Figure 37). As investigations proceeded, it was determined that the deposit had been partially disturbed in antiquity by the way some capstones were placed loosely and incorrectly and the contents of the tomb appear to be “strewn about” (A. Chase and D. Chase 1987:43). A. Chase and D. Chase (1987:43) also note that, “Red pigment was noted on the frontal bone of the individual [and] In the cut above the capstones, 435 pieces of obsidian were recovered; an additional 179 pieces of obsidian were within the tomb.” In total, 624 pieces were analyzed from this context.

Operations C87B, C87E, and C87F were designated for investigations in Caracol’s Central Acropolis just to the southeast of the A Group. These on axis excavations explored two separate areas associated with the northern structure during the 1992 field season. The first was a 2-meter by 2-meter excavation that investigated the interface of where the structure abuts the plaza level (C87E and C87F). The second excavation (C87B) was of a similar size and explored the summit of Structure A34 (see A. Chase and D. Chase 1996 66-67, Figure 4). Both excavations encountered tomb chambers. The lower tomb (S.D.C87E-1) was presaged by large amounts of obsidian encountered soon after excavations had begun. A total of 5,208 pieces of obsidian were recovered. Some of this obsidian was inside the tomb chamber as well. A. Chase and D. Chase (personal communication) state that the obsidian deposit is associated with a date of approximately A.D.682; however, this later date is associated with a re-entry event (D. Chase and A. Chase 1996). The initial tomb construction occurred at c.a. A.D. 577 or 582 (D. Chase and A. Chase 1996:75), but a secondary interment was placed inside during a re-entry about 100 years later (D. Chase and A. Chase 1996:71). The earlier date and initial construction of the tomb is supported by the presence of a red painted panel on the northern wall with faint remains of hieroglyphic texts. This tomb also had a painted capstone that yielded the original date of the chamber (see A. Chase and D. Chase 1996:68). An inventory of the three above tomb contexts is presented in Table 7-13. Comparisons of these three tomb contexts shows that complete reduction profiles are present in each, although their respective percentages vary slightly (Table 7-14 and Figure 7-7).

Other tombs investigated at Caracol may also exhibit deposits of obsidian above capstones that form the roof of vaulted tomb chambers. These may include those tomb burials in Structure B20, the eastern structure atop Caana. While excavations did not explore the areas directly above capstones in this structure, it was noted that there was an unusual amount of obsidian from within at least one tomb chambers, leading excavators to think it must have eroded down from above the tomb's capstones (D. Chase, personal communication 2013). As mentioned in Chapter 4, obsidian data from Operation C138 may also suggest some degree of obsidian deposition within and potentially above a tomb. The single tomb explored at the “Tres Grades” group, again did not explore the area above the capstones, but rather followed the partially exposed tomb entrance on the eastern side of the structure. Excavations from within this tomb (S.D.C138C-1) recorded at least 96 pieces of obsidian and probably double this amount in chert flaked stone. Below this tomb was an even lower chultun burial (S.D.C138C-2). No obsidian was recovered from the lower chultun burial.

Table 7-13. Summary of obsidian from Operations C12 (A.D. 695), C19 (A.D. 613), and C87 (c.a. A.D. 677-700).

Stage/Context	C12 Str. A3		C19 Str. L3		C87 Str. A34		Totals	
Prismatic Blade Production	n=	Wt. (g)	n=	Wt. (g)	n=	Wt. (g)	N=	Wt. (g)
Percussion Technique: Core Shaping	1,504	3,138.5	32	83.6	152	302.7	1,688	3,524.8
Macroblade	1	9.1	-	-	30	99.9	31	109
Macroblade with cortex	-	-	9	18.3	-	-	9	18.3
Macroflake	185	686.9	15	41.8	7	27.2	207	755.9
Macroflake with cortex	73	244.4	6	19.9	15	46.8	94	311.1
Object from macroblade	2	5.9	-	-	-	-	2	5.9
'Small' percussion blade	337	551.8	2	3.6	51	63.2	390	618.6
'Small' percussion flake	906	1,640.4	-	-	49	65.6	955	1,706
Pressure Technique: Blade Production	3,167	2,357.7	352	208.92	2,900	2,059	6,419	4,625.62
Final-series (3’s)	975	671.4	37	33.22	1,676	1,315.7	2,688	2,020.32
Blade (macro-wear absent)	970	665.7	34	29.82	1,664	1,302.6	2,668	1,998.12
Complete	8	4.9	8	8.04	179	146	195	158.94
Distal	342	180.1	1	1	336	197.9	679	379
Med/dist	-	-	2	1.04	-	-	2	1.04
Medial	292	143.8	7	2.7	407	229.6	706	376.1
Plunging distal	99	152.7	-	-	29	52.6	128	205.3
Prox/med	2	1.1	6	7.04	9	9.2	17	17.34
Proximal	227	183.1	10	10	704	667.3	941	860.4
Edge-mod. Tool (macro-wear present)	5	5.7	3	3.4	12	13.1	20	22.2
Distal	-	-	-	-	1	1.8	1	1.8
Med/dist	-	-	1	1.4	-	-	1	1.4
Medial	2	1.6	-	-	6	4.2	8	5.8
Plunging distal	1	1.2	-	-	-	-	1	1.2
Proximal	2	2.9	2	2	5	7.1	9	12
Initial-series (1’s and 2’s)	2,192	1,686.3	315	175.7	1,224	743.3	3,731	2,605.3
Blade	2,190	1,684.4	315	175.7	1,222	741.3	3,727	2,601.4
Complete	-	-	1	0.8	15	14.5	16	15.3
Complete and fragments	2,190	1,684.4	313	173.6	1,131	651.7	3,634	2,509.7
Distal	-	-	-	-	1	0.3	1	0.3
Medial	-	-	-	-	2	1.4	2	1.4
Overhang removal	-	-	-	-	32	28.5	32	28.5
Prox/med	-	-	-	-	1	2.5	1	2.5
Proximal	-	-	1	1.3	40	42.4	41	43.7
Edge-mod. Tool	2	1.9	-	-	1	0.5	3	2.4
Distal	2	1.9	-	-	-	-	2	1.9
Medial	-	-	-	-	1	0.5	1	0.5
Point	-	-	-	-	1	1.5	1	1.5
Complete	-	-	-	-	1	1.5	1	1.5
Percussion Rejuvenation Debitage	1,131	2,005.4	72	66.1	779	1,365.1	1,982	3,436.6
Core section flake	30	79.7	14	22.5	35	1,48.9	79	251.1
Cortical core-top fragment	45	92.7	-	-	2	2.6	47	95.3
Distal orientation flake	257	695.4	9	12.9	206	440.6	472	1,148.9
Faceted core-top fragment	30	65.7	-	-	6	9.5	36	75.2
Faceted/striated core-top fragment	38	64.1	-	-	6	17.1	44	81.2
Indeterminate core-top fragment	-	-	4	7.5	2	15.1	6	22.6
Indeterminate rejuv debitage	-	-	3	4.9	4	6.6	7	11.5
Lateral core rejuv	86	74.6	-	-	22	34.4	108	109
Pecked ground core-top fragment	22	60.9	-	-	-	-	22	60.9
Platform prep flake	623	872.3	42	18.3	458	599	1,123	1,489.6
Striated core-top fragment	-	-	-	-	36	87	36	87
Objects from core rejuv	-	-	-	-	2	4.3	2	4.3

Table 7-13. Continued

Stage/Context Prismatic Blade Production	C12 Str. A3 n=	 Wt. (g)	C19 Str. L3 n=	 Wt. (g)	C87 Str. A34 n=	 Wt. (g)	Totals N=	 Wt. (g)
Blade-Cores and Blade-Core Fragments	39	235.1	65	234.2	335	2,200.14	439	2,669.44
Bidirectional blade-core	3	28.7	3	28.3	7	151.3	13	208.3
Complete	-	-	1	13.3	-	-	1	13.3
Distal	1	4.2	2	15	3	46.1	6	65.3
Indeterminate	2	24.5	-	-	-	-	2	24.5
Lateral	-	-	-	-	2	30.8	2	30.8
Proximal	-	-	-	-	2	74.4	2	74.4
Unidirectional blade-core	33	189.8	62	205.9	318	1,928.24	413	2,323.94
Complete	-	-	-	-	1	10.1	1	10.1
Distal	3	15.5	6	14.5	23	209.6	32	239.6
Distal/ lateral	1	13.9	-	-	33	223.34	34	237.24
Indeterminate	-	-	8	12.3	56	95.3	64	107.6
Lateral	18	89.9	1	9.8	37	171.8	56	271.5
Medial	3	22.4	6	65.8	26	326	35	414.2
Medial/lateral	-	-	33	72.4	84	551.6	117	624
Proximal	5	23.6	1	11.6	39	225.3	45	260.5
Proximal/ lateral	3	24.5	7	19.5	19	115.2	29	159.2
Objects from exhausted core	3	16.6	-	-	10	120.6	13	137.2
Edge-modified tool	3	16.6	-	-	3	40.4	6	12
Complete	1	6.1	-	-	-	-	1	6.1
Distal/ lateral	1	5.7	-	-	-	-	1	5.7
Lateral	1	4.8	-	-	-	-	1	4.8
Medial	-	-	-	-	2	31.1	2	31.1
Medial/lateral	-	-	-	-	1	9.3	1	9.3
Notched	-	-	-	-	4	50.8	4	50.8
Distal	-	-	-	-	1	17.4	1	17.4
Lateral	-	-	-	-	1	21.9	1	21.9
Proximal/ lateral	-	-	-	-	2	11.5	2	11.5
Other	-	-	-	-	2	25.4	2	25.4
Medial/lateral	-	-	-	-	2	20.1	2	20.1
Striated core-top platform	-	-	-	-	1	9.3	1	9.3
Non Blade-Core Objects	1	0.3	1	8.2	-	-	2	8.5
Biface thinning flake	1	0.3	-	-	-	-	1	0.3
Point	-	-	1	8.2	-	-	1	8.2
Undiagnostic Debitage	784	369.8	102	27.9	1,042	302.15	1,928	699.85
Flake	-	-	-	-	1	0.3	1	0.3
Fragment	-	-	102	27.9	-	-	102	27.9
Various debitage	784	369.8	-	-	1,041	301.85	1825	671.65
Total from above Tomb chambers n=	6,626	8,106.8	624	628.92	5,208	6,229.09	12,458	14,964.81

Table 7-14. Summary of broad technological types by above tomb context.

Type	C12	%	C19	%	C87	%	Total	%
Macro Core Shaping	261	3.9	30	4.8	52	1.0	343	2.8
Small Percussion	1,243	18.8	2	0.3	100	1.9	1,345	10.8
Initial-series	2,192	33.1	315	50.5	1,224	23.5	3,731	29.9
Final-series	975	14.7	37	5.9	1,676	32.2	2,688	21.6
Rejuvenation Debitage	1,131	17.1	72	11.5	779	15.0	1,982	15.9
Cores	39	0.6	65	10.4	335	6.4	439	3.5
Non-blade Related	1	<1	1	<1	-	-	2	<1
Undiagnostics	784	11.8	102	16.3	1,042	20.0	1,928	15.5
Totals	6,626	100	6,24	100	5,208	100	12,458	100

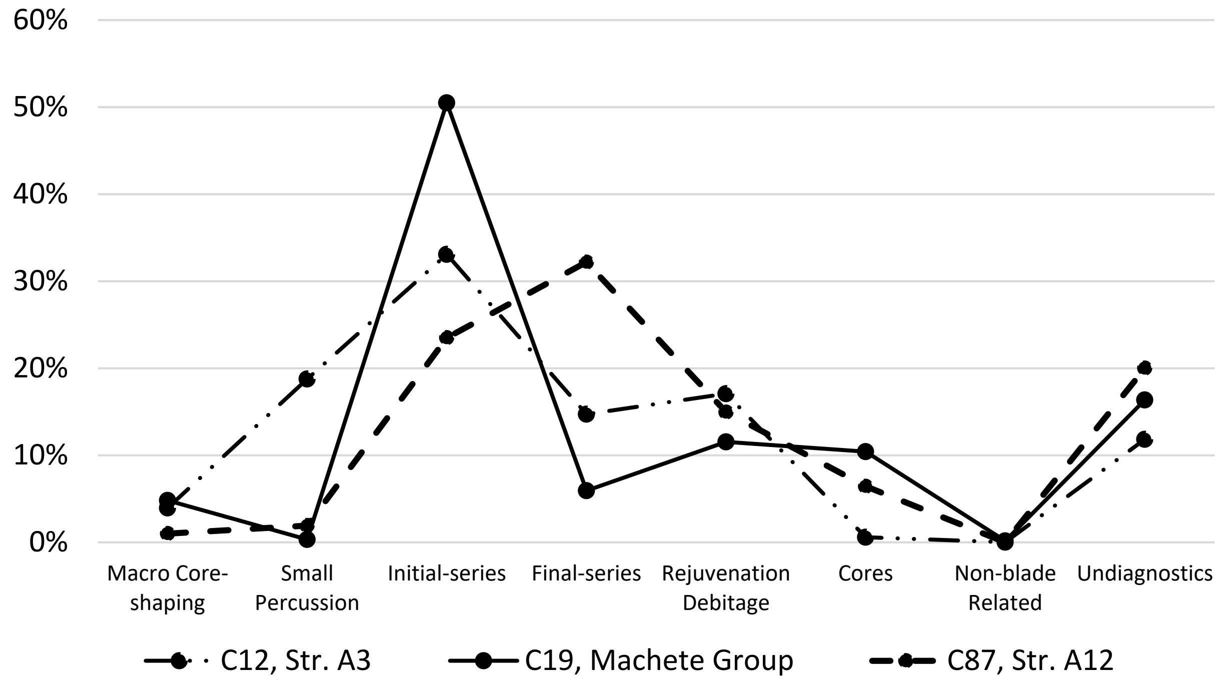


Figure 7-7. Reduction profile showing the percentages of broad technological types present in above tomb context. Notice that all major technological types are present in each of the three contexts.

Summary: Quotidian Practices and Ritualizing Obsidian

Obsidian inventories from quotidian refuse/construction fill and from caches and burials shows that obsidian was used for many different types of household activities. Chapter 6 and seven have already shown that markets facilitated much of household provisioning. Provisioning of ritual items may also have occurred through market transactions; however, provisioning the three tomb contexts described just above was probably much different, probably due to the labor that was needed. These burial events were most likely provisioned by gifting or, more likely, some other non-market form of exchange (direct transaction) between obsidian crafters and those related to the deceased. All this provisioning has implications for how we discuss: (1) aspects of craft organization – particularly the maintenance of space; (2) understand the formation of archaeological record: and, (3) infer other stages of obsidian's itinerary. I will address each of these in turn as a way of concluding this chapter's content.

First, there is a contrast between provisioning quotidian activities and more ritualistic residential practices. The contrast can be situated within the timing of specific residential activities. Those daily activities likely required a need to acquire blade tools from markets on a regular basis throughout a given month or year, whereas ritualized obsidian appears to be necessarily acquired during the preparation for rituals involving a human interment in association with important calendrical or other recurring historicized events (see A. Chase and D. Chase 2013). Therefore, the pace of market visitation is contingent not only on daily need and regular visits to a given local market, but also on human deaths and cyclical ritual events. The provisioning of rituals likely effected the regular rhythm and atmosphere of markets during the time leading up to ritual events. This has implications for the organization of obsidian craft activity as well. Obsidian crafters must have not only produced and curated blades before supplying a market on a fairly regular basis, but they must have also acted to curate all the related debitage and spent cores that would later become transformed and ritualized elsewhere. This was done in preparation for rituals and to materially express a shared notion of the passage of time. And, because many ritual caching cycles are argued to occur at 20 to 40 year intervals (see A. Chase and D. Chase 2013), it may be that some obsidian objects were curated either at workshops or at other residences for quite some time before being positioned alongside other materials and additional human participants. Furthermore, crafters may have had to transport more to markets just before shared events that appear to be acknowledged by potentially hundreds or even thousands of residences.

Second, these practices on the part of obsidian crafters to maintain their work areas, first for safety, as well as for any anticipated need to provision daily and ritual life far beyond one's work area, may have had significant effects on the formation of the archaeological record. More directly, the data presented above shows that while blades were used daily by basically every residence, other non-blades (as well as blades) were used for many rituals. In order to provision these practices, a given workshop area saw significant efforts to manage production waste and at particular times was effectively cleaned of all craft production refuse. The three above tomb deposits also show that once these materials were moved to above a burial chamber, there may have been little left at a workshop. These kinds of redeposits may reflect creative refuse disposal (see Moholy-Nagy 1997) *as well as* a significant ritual offering, especially if we think of these deposits as larger versions of household caches. An unintended consequence of ritual provisioning was the maintenance of work space. If this is true, it might explain why very few obsidian workshops have been recovered from the Maya area, and no workshop has been directly investigated at Caracol.

A summary of the general types of obsidian from the three tomb deposits at

Caracol, the one tomb deposit at Dos Hombres, Belize (see Trachman 2002), and those published inventories of Maya and non-Maya workshops helps to illustrate and argue this point. Table 7-15 lists a general inventory of the three above tomb deposits at Caracol and one present from the northern Belize site of Dos Hombres. In contrast to the more detailed categories presented in Table 7-14, many were conflated into even more broadly labeled categories based on differences in analysis. Despite the lumping, the kinds of artifacts are very similar or near identical from both sites; hence, the comparison. All three contexts at Caracol sampled 100 percent of the assemblages, while Trachman (2002:107) sampled 25 percent. The relative percentages are quite similar and the reduction profile (Figure 7-8) shows a similar trend line overall between deposits. No other above tomb context has sufficient published data to be included at the time of this comparative analysis (see Moholy-Nagy 1997). General trends include about 4 to 40 percent percussion debitage, 50-70 percent blades (at Caracol, these are mostly initial-series blades), 13 to 20 percent rejuvenation debitage (no rejuvenation debitage was shown from Dos Hombres), and lastly 1 to 13 percent were blade-cores (most of which were fragments). Although some variation exists, it would seem from this sample of four contexts that there are relatively equal amounts of major artifact types being deposited above tombs. In other words, these deposits are more alike than different.

Table 7-15. Obsidian summary for four above tomb deposits, three are from Caracol, Belize and one is from Dos Hombres, Belize (see Trachman 2002).

Tomb Context	Tomb, A Group Str. A3	Tomb, Machete Str. L3	Tomb, Central Acrop. Str. A34	Tomb, Dos Hombres
Reference	C12 (this document)	C19 (this document)	C87 (this document)	Trachman 2002
Stage	%	%	%	%
Percussion	26	6.1	3.6	38.2
Blades	53.7	67.5	69.6	49.1
Rejuvenation	19.5	13.8	18.6	no data
Cores/Frags	<1	12.4	8	12.6
Totals (n=)	5,778	521	4,166	5,711

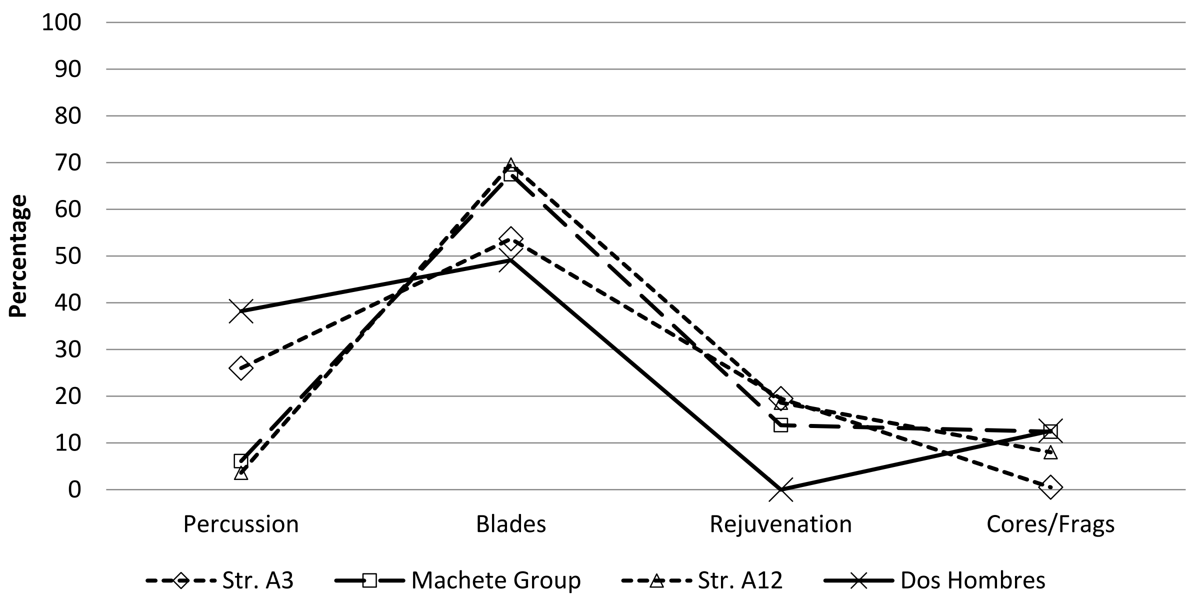


Figure 7-8. Percentages of major reduction categories or stages for three above tomb contexts.

When compared to published inventories of Maya obsidian workshops it becomes evident that workshops are being cleaned of waste debris. Four workshop areas were used for comparison (Table 7-16): El Laton, Ojo de Augua, Kaminaljuyu, and El Pozito. Each of these workshops produced blades, but do not necessarily date to the same time period. For example, the Kaminaljuyu workshop is earlier than both El Laton and El Pozito (see Hirth 2006). If the above tombs represent redeposited workshop materials, their general reduction profile should be similar (Figure 7-9).

Percussion debitage from obsidian workshops is similar, with the exception of the Kaminaljuyu workshop. There is likely more percussion debitage at this workshop because they are closer to the El Chayal, Ixtepeque, and San Martin de Jilotepeque sources and there was greater attention to initial stages of core preparation. This stage of core shaping occurred less at sites further away because most core shaping occurred closer to quarries. Blades make up the majority of the inventories, but it is unclear if these are mostly initial-series blades, final-series blades, or a combination of both. Rejuvenation debitage, when present in published tables, is between 1 to 15 percent. The percentages of blade-cores do vary. The major difference is that many cores were recovered from the El Laton workshop and almost zero at the other workshops. Overall, the general trend is similar to those above-tomb reduction profiles presented above (Table 7-17 and Figure 7-10). These like trends are slightly different when compared to non-Maya workshops investigated in central Mexico (Table 7-18 and Figure 7-11). This difference is due to the location of some sites closer to sources (e.g., Tula and Teotihuacan) and the nature of exchange that brought obsidian into workshops (e.g., Xochicalco).

Table 7-16. Summary of obsidian workshop findings from a sample of Maya sites.

Maya Workshop	El Laton, Plaza Area	El Laton, Str. 1	Ojo de Augua	Kaminaljuyu	El Pozito
Reference	Olson 1994:25, Table 1	Olson 1994:25, Table 1	Clark and Bryant 1997:117, Table 1	Hirth 2006:174, Table 1	Neiven and Libbey 1976
Stage	%	%	%	%	%
Percussion	no data	4	2	44.4	1.5
Blades	50	42	89.5	54.6	99
Rejuvenation	15	13	8.3	0.6	no data
Cores/Frags	35	41	<1	<1	<1
Total (n=)	1,028	2,267	6,192	1,330	12,082

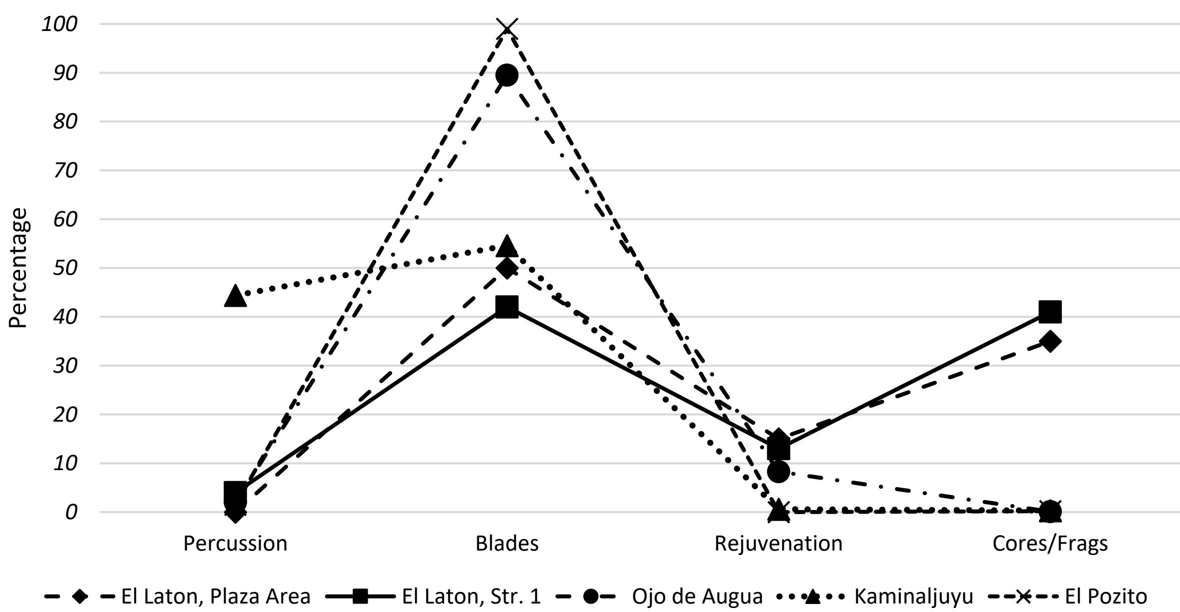


Figure 7-9. Percentages of major technological categories or stages of reduction at four Maya workshops.

Table 7-17. Reduction profile and summary of averages of four Maya above-tomb deposits, Maya obsidian workshops, and non-Maya obsidian workshops.

Stage	Avg. Above Maya Tombs	Avg. Maya Workshops	Avg. non-Maya Workshops
Percussion	18.5	10.4	47.7
Blades	60.0	67.0	38.3
Rejuvenation	13.2	7.3	12.3
Cores/Frags	8.4	15.3	1.7
Percentage total	100	100	100

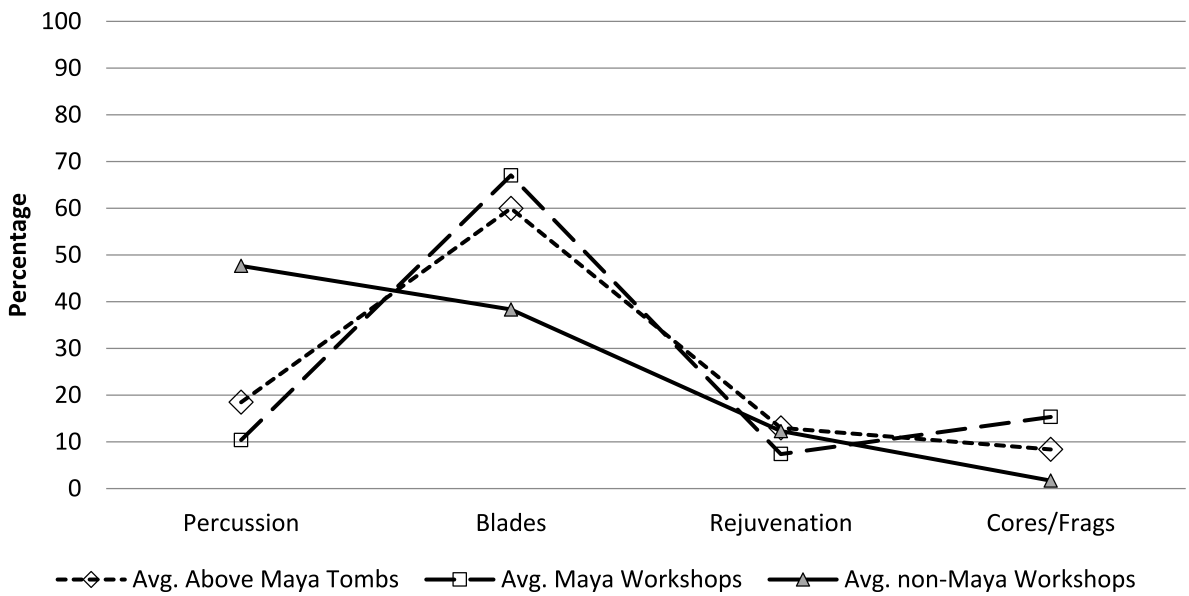


Figure 7-10. Reduction profiles showing averages of major reduction stages for above tomb deposits, Maya workshops, and non-Maya workshops (see Table 7-15, Table 7-16, Table 7-18 for actual percentages).

Table 7-18. Summary of obsidian workshops from a sample of non-Maya sites.

non-Maya Workshop	Xochicalco	Tula	Teotihuacan (surface collections)
Reference	Hirth 2006:67, Table 3.1	Healan et al. 1983:137	Andrews 2002:52, Table 5.5
Stage	%	%	%
Percussion	<1	84.8	57.7
Blades	72	14.2	28.8
Rejuvenation	27.6	no data	9.27
Cores/Frags	<1	0.5	4.1
Total (n=)	226,894	321,477	97

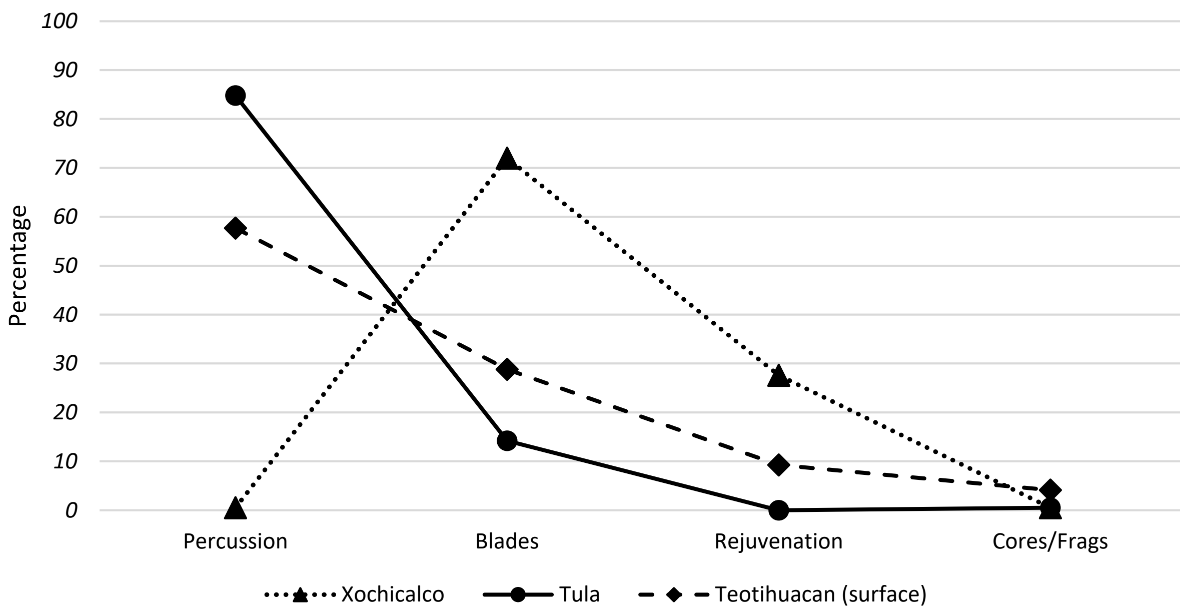


Figure 7-11. Percentages of major technological categories or stages of reduction at three non-Maya workshops. Note that Hirth (2006) states that already exhausted cores were imported in Xochicalco and therefore no percussion or macrocore shaping debitage is present.

Third and finally, this chapter's content has argued that obsidian was useful during different social interactions in the past and that an itinerary approach that follows the movement of materials emphasizes how workshops were maintained to provision not only domestic life but also to materialize ritual expression. Blades were used almost exclusively as quotidian tools and were deposited as part of a human burial assemblage. Both blades and non-blades were used or ritualized to a significant extent during events that included caches. Taken together, the obsidian data shows that each piece of obsidian material was socially, economically, and ritually important, depending on the circumstance of its use; however, obsidian could only have been useful in the materialization of quotidian and rituals practices after it was transformed into useable objects. Reconstructing the itinerary therefore shows that blades moved out of workshops with some regularity to keep up with market and consumer demand. Households demanded blades for daily use as well as deposition with deceased individuals. In contrast, obsidian blade production debitage and exhausted cores would have likely been curated at workshops (or at households preparing for caching rituals), exhibiting a longer period of stasis in one location.

Most exhausted blade-cores were also smashed, terminated, destroyed, or socially and physically “killed” through various methods resulting in a variety of forms. Some fragments remained together, however, and reflect intentional acts of fragmentation (Chapman and Gaydarska 2007) perhaps in preparation for additional rituals elsewhere. These practices of destruction and fragmentation could have acted to link distant places, other individuals (i.e., crafters, merchants, market managers – those that facilitated the movement of stone), as well as to link or recognize past and future recurring events during present rituals. In this way, a single destroyed core was an indexical and bundled object (see Haskell 2015; Joyce 2007; Keane 2005) containing unique properties which afforded it a ritual association. As the last blade was removed, the once productive core was exhausted and transformed. These exhausted cores were then, or sometime later destroyed and thus transformed again. During this latter stage of physical transformation, they were simultaneously ritualized and their properties recognized by those active human agents. Each piece had its intended place of use, existence, and impact on the living, but the pathways, the pace, and the forms at which each moved to consuming households varied markedly.

CHAPTER 8
RETRACING A ROUTE AND FUTURE DIRECTIONS

Toward an Itinerary of Obsidian as Reflected from Caracol, Belize

The preceding chapters presented various analyses of obsidian artifacts from Caracol, Belize. These analyses were directed to operationalize a multi-scalar research program that dealt with the movement of flaked stone from quarries (or other non-local production places) through to their use and discard at Caracol's residences. The analytical methods used in this work are not unique to the study of lithics, but it is the first time they have been applied to Caracol obsidian assemblages. Consequently, data are now available for a more in depth comparison with concurrent and future collections from other Mesoamerican archaeological sites. Future research will be directed at making these kinds of comparisons more explicit than may have been presented in the previous chapters. The closing section of this dissertation discusses further future research and some broader impacts this research may have.

In addition to standard analytical methods utilized above that produced descriptive and interpretive knowledge from lithic assemblages, I employed a theoretical framework that focused on itineraries. This approach enabled cohesion between general and seemingly separate research questions presented within individual chapters. Since nearly every household residence in Caracol used obsidian, these itineraries (which are themselves a subject of study) exposed the numerous interconnected and historical relationships that existed between the many actors who moved, transformed, and used obsidian both regionally and locally. To be sure, those human actors structured obsidian itineraries in the past, yet the material qualities of obsidian simultaneously structured human actions. Working in concert, human actors and non-human actants played important roles in various social, economic, and physical transformations.

It is within this context, as seen through various types of analyses, that I conclude by summarizing the routes obsidian traveled. In addition, I argue that many Maya peoples used obsidian to (re)produce domestic (residential) practices during the Classic period at Caracol. These practices – forming fundamental aspects of household identity – were facilitated through an interaction between non-human actants (i.e., obsidian itself) and human actors (i.e., obsidian craft producers and their extended social network). The use of obsidian in both quotidian activities and ritual events at most of Caracol's residences provide material evidence of these interactions.

Distant Quarries, Extra-local Production, and Importation into Caracol

The general trends of the *HHpXRF* study showed that El Chayal obsidian dominated the sampled contexts from Classic period; however, this appears not to be the case earlier in time for the Late Preclassic. The shift from Ixtepeque obsidian to El Chayal during the Late Preclassic is likely due to insufficient sampling from early period deposits. Despite the lack of a robust Late Preclassic sample size, El Chayal obsidian increases in frequency through time suggesting the quantity and routes it traveled concretized or became more stable over time (see Chapter 4).

Transportation of obsidian from the Guatemalan highlands into Caracol could have taken a number of routes. Existing models show transport into and through the Petén area of present day Guatemala that included both land and riverine water routes. Proposed as an alternative to, or simultaneously with the Petén-centered model, data from Caracol suggest that obsidian from El Chayal, Ixtepeque, San Martin de

Jilotepeque, and La Union (Honduras) could have entered from the south via land and water routes as well. Obsidian could have traveled the same route as jadeite materials from the Motagua Valley. Reports from Cancuen, however, show that both obsidian and jadeite were transformed to a significant extent and moved through the area just south of the Petén. Perhaps after traveling through and past sites along the Rio Passion (i.e., Cancuen), obsidian was diverted from a path in the northern Petén (that would have taken it to sites such as Tikal) and went to the southern and central areas of present day Belize (e.g., following the Classic period trade route from the Passion to the Belize River [A. Chase and D. Chase 2012]).

During the Terminal Classic period there appears to be a drop in overall obsidian consumption when viewed through the obsidian sourcing results. Like the lack of a robust Late Preclassic obsidian source sample, this apparent decrease in percentage is likely due to small sample sizes from later deposits. Despite the existing sample issues, the proportion of El Chayal to Ixtepeque obsidian between the Late Classic 2 (1,147:62 or 18.5 pieces of Ixtepeque to every one piece of El Chayal) and Terminal Classic (68:12 or 5.6) phases shows a marked decrease or relative equaling in the proportion of El Chayal to Ixtepeque overall. This shift suggests that Ixtepeque may have begun to be imported in higher or near equal amounts to that of El Chayal just prior to the site's abandonment as was the case for the Postclassic period in the northern Lowlands (see Nazaroff et al. 2010:888). Hints of this shift may be present from the Caracol data.

Technologically, both El Chayal and Ixtepeque obsidian were imported as roughed-out macrocores. Importation in this form suggests that Caracol's relationship with regional traders was such that obsidian was procured and modestly reduced close to the source and was not significantly reduced at “down-the-line” political centers before arriving at the site. In other words, Caracol received macrocores, some still with cortex, as opposed to percussion/pressure shaped polyhedral cores that were ready for blade removal and/or in need of rejuvenation (see Hirth 2006). This is likely due to Caracol’s established strength as a regional consumer and its history as a center of gravity for other kinds of commerce. Thus far no data suggest that other politically powerful centers close to Caracol had significantly reduced macrocores from Ixtepeque and El Chayal sources prior to obsidian’s arrival at Caracol’s workshops/markets. It appears that macrocores were not shaped into polyhedral pressure blade-cores before arriving at Caracol, rather this reduction occurred locally; Caracol was a primary importer of El Chayal and Ixtepeque macrocores. These data also imply that local obsidian crafters possessed the adequate knowledge to transform percussion macrocores into pressure blade-cores. Once these macrocores were reduced to produce prismatic blades, exhausted blade-cores, related percussion debitage, and pressure blades circulated throughout the site (see below).

Unlike Guatemalan and Honduran obsidian, Mexican obsidian began to arrive at Caracol during the Middle of the Early Classic as ready-made tools. These forms included Stem-B type projectile points, other projectile points, blades, and bifacial knives. Most of these and later imported objects were not circulated beyond the city center, but were likely used during specific rituals soon after arrival (A. Chase and D. Chase 2011; Johnson et al. 2010) and therefore may have signified regional relationships that Caracol’s elite had with politically powerful non-Maya (or non-Caracol) elite partners. Some green, Pachuca, obsidian blades, however, did circulate to a very limited extent beyond the city center. These blades, some of which were not included in the sourcing study, were used much like Guatemalan-sourced blades and were part of obsidian assemblages at a few non-elite residences. These blades exhibited edge-damage and were recovered from household refuse/construction fill contexts. In general, however, distributions of obsidian sourced from beyond the Maya area (i.e., outside of Guatemala or Honduras) do not appear to have been available to the wider Caracol population. This suggests that while obsidian overall was accessible to the population, some objects from further afield were not. Certain finished objects followed an itinerary that lead them to a direct transfer to Caracol's elite or a limited exchange within epicentrally located markets.

Although it is difficult to ascertain the exact regional and local route(s) through which obsidian arrived at workshops, local importation did occur at a noteworthy scale and supplied most households with obsidian in generally consistent quantities when compared to distributions of locally available chert flaked-stone. Once obsidian arrived within Caracol's limits, El Chayal and Ixtepeque macrocores (and possibly other obsidian sources) may have passed through local markets at Caracol before arriving at local workshops. Alternatively, regional traders could have exchanged directly with workshop crafters bypassing markets all together (and the workshop crafters would then have brought finished objects to the market). If regional traders/transporters of obsidian interacted at markets to deal with obsidian specialists, they could have also interacted to a greater extent with other raw material consumers as well. These possible interactions at markets could have provided a larger social space for the sharing or exchanging of knowledge of both regional trade connectivity and lithic technology.

These kinds of proposed relationships and interactions may help to explain why lithic crafters at Caracol appear to have worked obsidian similarly to other sites. In addition, it may also help to background how and why some of Caracol's chert crafting households used obsidian pressure blade production (Johnson et al 2014). In this scenario, the act of coming together to share knowledge of technological practice and the material qualities of stone, may aid in identifying the processes by which ancient "communities of practice" formed.

Obsidian's Arrival and Local Movement

Widespread residential access to obsidian suggests that crafters had some type of relationship(s) with markets (see Chapter 6). Initial dealings at markets could have been to acquire obsidian macrocores; however, acquisition of obsidian before blade production could have occurred through a few different scenarios. Craft producers could have acquired bulk loads of obsidian from markets by dealing directly with regional traders as they entered the site. *Alternatively*, crafters could have traded with regional merchants outside of markets. Although obsidian crafters could have potentially dealt directly with regional traders, markets would have provided a space for visible negotiation and broader exchange. Regional traders may have been in lock-step with local market cycles or vis-versa and thus markets and visitation by traders would have provided some amount of predictability in local supply and demand. In other words, traders dealing with local crafters would have been visible to the larger population on "market day." Or obsidian specialists could have acquired obsidian as an outcome of relationships between city center elites and regional obsidian traders. Elites as brokers could have negotiated the exchange of bulk obsidian goods that would have then traveled to specialized workshops. This relationship may have been likely because of the large amounts of obsidian recovered from above three elite tomb contexts at Caracol. At Caracol no definitive evidence of an obsidian workshop has been found; however, research elsewhere has shown that obsidian workshops were not common and when present, obsidian workshops are not necessarily located near city center elite dwellings (e.g., Rice and Puleston 1981; Puleston 1969). The concentration of obsidian above many elite tombs at some major Maya sites, including Caracol, shows an effort by obsidian workers to locally curate, transport, and deposit huge quantities of debitage and terminated exhausted cores above at least three city center tombs. These actions by local obsidian crafters may have been conducted to recognize and honor the significant relationship between themselves and particular royal elites.

In any of these above scenarios, obsidian specialists received and locally reduced a sufficient amount of obsidian to provision the broader population with both quotidian blade tools, and ritual obsidian objects.

Transformation at Workshops

Once obsidian made it to local workshops, crafters transformed macrocores to remove standardized blades (see Chapter 5). The reduction process resulted in producing a complex collection of debitage and regular sized exhausted cores. The present study of Caracol obsidian assemblages reveals a similarity both in technology and composition to other studies of Maya lithics and more broadly those in Mesoamerica, suggesting that Caracol’s obsidian crafters appear to have been following an existing structured knowledge/skill of blade production in the wider region (see Hirth and Andrews 2002). In particular, Caracol obsidian specialists employed a number of strategies to prepare blade-core platforms throughout the reduction process and after blade-core rejuvenation. They also practiced similar strategies for removing pressure blades as evidenced by the uniformity or blade width and length.

This physically transformative process produced obsidian “goods” (or blades) as well as other non-blade pieces in the form of debitage and exhausted cores. As Chapter 5 introduced (see also Chapter 7), many of these non-blade pieces were ritualized during events of human burials and, more likely, ceremonial cache offerings. This typological and contextual correlation (see Chapter 7) suggest that there was likely a causal relationship between how non-blade pieces were managed during the crafting process and the demand for household ritual obsidian objects (see also Hruby 2006, 2007). Thus, at yet unknown local workshop locales, the itinerary of obsidian was changed significantly by becoming *fragmented*. At this point, certain objects (i.e., blades) were likely readily and regularly moved from workshops to provision residences, while others (i.e., non-blade debitage and exhausted cores) experienced potentially long periods of stasis at workshops and/or at other households. As part of ordered workshop management these objects would have been gathered and curated in a safe location, away from regularly traveled pathways. At some later point in time, they were then selected, circulated/distributed, and ritualized during household events. Workshop waste management and provisioning state level and domestic ritual events (including supplying large amounts of obsidian above elite tombs) could have, therefore, resulted in the erasure of most macro-scale archaeological evidence for locating obsidian workshops.

These ritualized obsidian objects may have circulated via markets, but their pace of travel through markets probably was dependent on the timing of domestic ritual events, some of which were cyclical and decades apart (A. Chase and D. Chase 2013; D. Chase and A. Chase 2011). The morphology and presence of refits among destroyed exhausted blade-cores in caches (n=12, or 37.5%) lends support for the special treatment of non-blade related objects (see Table 7-10). The presence and type of these refits suggests that knowledge of how to destroy cores and produce standardized forms was known by many (assuming core destruction occurred just prior to ritual deposition). In most cases, not all pieces of a destroyed exhausted blade-core were present in a given cache, thus showing that "fragmentation" was common. This practice of fragmentation would separate pieces from the destruction process and individual actors could then potentially curate them for use in subsequent rituals. This act of fragmentation and curation for later rituals connected humans to the ritual acts of core destruction and ritual cache deposition through the act of enchainment (Chapman and Gaydarska 2007). Material recalls memory (Jones 2007), and as such, the fragmented pieces of obsidian were a vehicle for both the remembrance of previous actions and for a preparation for future ritual events. Those moments in the itinerary of obsidian, changed the nature of the interaction between human and stone. Obsidian pieces separated from an exhausted core could remain *immobile* for decades before being used in later rituals. Ritualized obsidian, such as those that were implicated in ritual events (now fragmented) most likely moved through personal exchanges, rather than markets.

Movement through Local Exchanges

After crafters brokered the purchase of bulk obsidian from foreign traders and before regularly used blades and less frequently ritualized obsidian objects were used at non-obsidian crafting households, they circulated through markets (see Chapter 7). This assertion is supported through obsidian's fairly broad distribution across the site and its relationship with the consumption of more locally available chert flaked stone. Because markets were important places of interaction, obsidian crafters or their representatives must have had some type of relation with market managers, other vendors, and consumers. Crafters also possessed the necessary knowledge of Caracol's roadways and market schedules. As stated earlier, marketplaces provided a uniquely social and physical location by which to set the "prices" for certain obsidian goods. These exchange interactions may have likely been the place whereby obsidian producers procured other necessary materials they used during their crafting process and to supplement their subsistence needs. In terms of just crafting, interacting at markets could have enabled craft specialists (and their apprentices) to acquire necessary materials – both durable and perishable – to produce their contingent resources for the reduction of obsidian. These multi-crafting materials (see Hirth 2009) would have included grinding stones (for platform preparation), wood for holding cores during the pressure flaking process, antler, and/or other stone for percussion flaking, as well as possible ceramic containers to curate and transport reduction waste and exhausted cores away from workshops. A detailed look at any flaked or ground stone reduction tool kit reveals a host of diverse materials necessary for a specialized task (see Hirth and Flenniken 2006). The same multi-crafting model (see Shimada 2007; Hirth 2009) has been described for ceramic production as well (Van Gijn and Lammers-Keijsers 2010).

Ultimately, markets provide a place for producers, consumers, and materials to interact, negotiate, and/or maintain social relations (see King and Shaw 2015). Although a market exchange economy most likely included hundreds if not thousands of individuals (both customers and vendors assembling in a singular locale), accounting for how many of Caracol's residences procured most of their non-household produced items is extremely difficult. Notwithstanding, Caracol is argued to have multiple market places (D. Chase and A. Chase 2014a) and these were essential in how the "districts" operated (A. S. Z. Chase 2016). Markets were places that were socially and physically maintained, largely contingent on various actors and material resources, and embedded within existing daily activities and the ebb and flow of ritual cycles. Through technological and distributional analyses of obsidian, it appears that markets were critical locales for connecting various populations within the city proper and perhaps regionally. The data show just how extensive a single type of material has been transformed, fragmented, and then moved along interconnected routes, most of which included markets.

Residential Use, Taking Objects out of Circulation, and Concluding Remarks

Analysis from three broadly defined contexts (refuse/construction fills, burials, and caches) as reflected from nearly 200 household investigations at Caracol demonstrates associations between obsidian technological form or artifact type and where/how certain pieces were used, then deposited (see Chapter 7). These contextual and artifactual associations show that blades are more often found in refuse/fill and burial deposits (see Figure 7-1 and Figure 7-6), while other non-blade artifacts (i.e., blade-cores and blade production debitage) are more likely to occur in caches (see

Figure 5-34 and Figure 7-2). Correlations between artifact type and context enables predictive modeling by which research can target investigation of these kinds of contexts. Furthermore, being able to predict in a general way where certain types of obsidian objects are likely to occur sets up a framework by which to discuss and test for aspects of shared household consumption or use activities with regard to both quotidian and ritual practices. It also enables a more informed approach to consider the selective emphasis of particular objects.

Patterned consumption and use activities at Caracol's households indicate a shared "way of doing things," as well as highlights similarities in household identity and cooperation to access similar kinds of objects (for the same purposes) via the same kinds of exchange networks (i.e., markets). Differences between households do exist, although these are not evident in whether or not a given household had access to obsidian, but rather with regard to how much obsidian each household *could* obtain. This differential access, using just flake stone counts and the measurement of a given household (a proxy for wealth), shows that those larger, more architecturally complex, households or those with greater purchasing power could access more obsidian overall. Despite just using flaked stone counts and measurements of household size, comparisons of obsidian to locally available chert show that nearly all residential samples had proportionally consistent amounts of obsidian when compared to their supply of locally available chert flaked-stone. Clearly, obsidian was not a restricted material, thus suggesting Caracol's residences were more alike than different when it came to quotidian use of flaked stone. In other words, the distrubutional and contextual analyses demonstrated no clear division between elites and commoners in terms of the consumption of obsidian. Maya society at Caracol, during the Classic period, was networked, integrated, and nuanced when considering the internal exchange of materials.

Ritual use of obsidian was also fairly widespread. Residential ritualization of obsidian appeared to selectively include those critically transformative stages of core creation, maintenance (rejuvenation), and termination (Hruby 2007; Johnson 2015). Early dated deposits of notched (i.e., destroyed) eccentric blade-cores at city center elite residences suggest this practice began as early as the transition between the Late Preclassic 2 and the Early Classic 1 periods (A. Chase and D. Chase 2015a) and then became part of the broader residential ritual repertoire.

Following ancient Maya cosmology, the technological stages of blade-core shaping (macro debitage), rejuvenation, and core destruction were likely ritualized because they mirrored aspects of livelihood or vitality in which the raw material was transformed, activated, and destroyed in acts of (re)production of social and technological practices. Core shaping debris embodied the creation of a useful “body” or in the case of obsidian, a productive blade-core. Rejuvenation debitage signified the skill and work to maintain this body. Core destruction debitage and the act of destroying and exhausted blade-cores signaled the end of a “life” and the release of its “essence” (Freidel 1998; Garber et al. 1998; Walker 1998). All of these separate pieces could move about on their separate itinerary, but be forever linked to broader processes and potential social meanings. And as a material with bundled qualities leading to its ritualization (see Bradley 2003; Keane 2005), each of these kinds of obsidian objects, their materiality, and their potential meaning(s) was a recognition on the part of an individual household to acknowledge *and* maintain the historically contingent connections between household practices and each household's relationship/dependency on distant sources of raw materials, regional networks, non-local actors, the local exchange economy, other local crafters, quotidian practices, and ritual cycles.

Future Directions and Broader Impacts

The data and interpretations presented in this dissertation suggest a number of areas for future research. First, continued sourcing of Caracol's obsidian with a focus on early and later temporal components would support current observations or suggest alternative interpretations. Although the obsidian sourcing analysis does have data from every major time period, context, and technological type, future sourcing studies should target deposits that date to the Preclassic as larger data sets would help to inform the origins of trade, local obsidian crafting, and use. Additionally, a greater sample size from the Terminal Classic would aid in understanding what kinds of changes in regional trade may have occurred prior to the site's gradual abandonment. Further investigations from sites in southern Belize and a more explicit concern with the circulation of other, non-obsidian, materials would help to highlight the complexities of potential southern routes juxtaposed with those established routes through the Petén (see Demarest et al. 2014).

Second, the data have shown that significant reduction of stone took place locally, although, the location of Caracol's obsidian workshops remains elusive. Few groups that were studied, as a result of this dissertation, may have retained minimal traces of obsidian crafting debris. Because it appears that significant waste management practices took place, future excavation methods should include sampling for micro-debitage in potential workshop areas, through fine screening and possibly micromorphology (Angelucci 2010; Cap 2015:115, Table 4.1; Maher 2005).

With the advent of finding workshops, future research on these locations may also help to determine their proximity to market locales, major built pathways, and the city center to better assess the social interactions local obsidian crafters had with regional traders, Caracol's elite population, and everyone else. Coupled with the locations of these areas, the construction of crafting identity is entangled in the crafter's knowledge of and interaction with multiple agents, groups, and communities in particular linking places. The location of work areas is particularly important if markets were places that provided a confluence for social interaction.

Third, Caracol provides an excellent place to study the roles of ancient household based craft producers. Because the data show the wide distribution of obsidian in various forms (most of which are linked to the local blade industry), further study can address how integral craft producers were connected to the provisioning of everyday/ritual life within a highly populated city (and not necessarily as attached or independent specialists). Although dualistic models of crafting can be problematic (see Costin 2007; Flad and Hruby 2007; Hirth 2009), obsidian crafters at Caracol did possess some type of important relationship with city center elites. This relationship is demonstrated by the massive amounts of obsidian debitage and destroyed cores above three burial chambers (see Chapter 7). Although crafters certainly interacted with at least a few of Caracol's royal elite during the Classic period, they were perhaps more important to those living at the edge as well as far beyond Caracol's monumental core. Because their crafts (i.e., blades) were distributed to most households (see Chapter 6), crafters, and those they interacted with at local markets, were critical for daily household operations. These tasks included using obsidian to cut, drill, and/or incise softer materials (perhaps shell). Additionally, obsidian workers facilitated and provisioned ritual events through curating and then distributing their waste flakes (from core shaping, rejuvenation, and core destruction) and mostly fragmented exhausted cores for ritual household caches.

Fourth, future research should explore the finer grained evidence for household development and activity (i.e., individual residential history or developmental phases) with respect to (1) the uses of obsidian through micro-wear and residue analysis; (2) the location of such household practices (and degree of connectivity to other areas of the site via roads); and (3) overall household obsidian quantities in comparison to other material assemblages. Access to obsidian was measured based on household wealth and other flaked stone data generally; therefore, future research should include an analysis of how multiple material datasets can provide a more detailed picture of ancient household consumption. Furthermore, distributional studies can be done with respect to the mapping of materials by descrete temporal components when possible. Considering detailed changes in obsidian amounts with regard to time period (and within alternative models of exchange [e.g., market, gifting, redistributive]) will help to mitigate the potential for equifinality (see Stark and Garraty 2010).

Finally, this study of obsidian shows we move beyond normal descriptions lithic industries. In so doing, the research advocates archaeologists explore various interconnected aspects of ancient technology within a complex society. The study of “technology” used here refers to how analysts research and understand the unfolding of people's relationships with the material world and ways in which these practices form part of their identity (Dobres 2006, 2010). Although this research did not explicitly engage in such a (phenomenological) practice theory approach, it did, however, develop a useful epistemology that focuses on assessing material movement, its transformation(s) (be it physical or social), and human-material interaction (Barad 2007; Ingold 2012; see also Joyce and Gillespie 2015:9-11). Other archaeological research using this kind of perspective, which follows matter, can expand the use of existing anthropological methods that better address the shifting socioeconomic value of objects through actions (Graeber 2001), and the processes by which non-human objects acquire and reproduce social meaning.

The research charted new territory to better explore how the study of a singular material and its movement and transformations can identity the nature of macro/micro political economics as well as understand both quotidian and ritualized practice. In order to do this, a suite of methods must be used in conjunction with a theoretical framework that does not privilege humans over non-humans (i.e., materials in this case), meaning that in order to understand the identity, practices, and performances of human agents we must explore how the non-human, material world, co-constructed social relations.

Obsidian was an economically and socially valued material for the ancient Maya both in what it could *do* in daily life as well as in what it could index through its ritualization. Obsidian's itinerary was complex and fragmented, and pervaded much, if not all, of ancient life at Caracol. Following the itineraries of obsidian exposes the interconnectedness of distant geologies, regionally powerful polities and merchants, and locally diverse yet highly integrated Caracol inhabitants. The use and ritualization of obsidian provided the opportunity for residences to create, express, and maintain a shared identity. Even today, the itinerary of Caracol's obsidian continues. As a result of this research, each piece in some way can reference this work. As archaeological artifacts, in that each piece was sorted, many measured, and still others exposed to X-Rays. The obsidian materials described in this work were necessarily useful to reproduce social life. In the past, many of the pieces helped people to live, to express a form of identity, and to materially connect themselves with others. The obsidian objects presented above fulfill the same type of purpose today.

APPENDIX A
COUNTS OF OBSIDIAN AND CHERT ARTIFACTS BY OPERATION (PROJECT SEASONS 1985-2015)

Op	Obs. (n=)	Chert	Green obs.	Op	Obs. (n=)	Chert	Green obs.	Op	Obs. (n=)	Chert	Green obs.	Op	Obs. (n=)	Chert	Green obs.
1	145	314	1	61	0	24	0	121	24	84	0	181	37	347	1
2	14	34	3	62	4	339	0	122	0	72	0	182	49	449	4
3	38	107	0	63	5	242	0	123	2	20	0	183	50	930	1
4	232	1175	1	64	6	12	0	124	8	63	0	184	100	539	0
5	3	4	0	65	13	123	0	125	6	322	0	185	113	454	0
6	79	456	0	66	1	23	0	126	0	6	0	186	100	1231	0
7	17	9	0	67	3	98	0	127	3	311	0	187	0	115	0
8	145	1065	0	68	10	19	0	128	1	7	0	188	43	364	0
9	4	29	0	69	0	0	0	129	11	505	0	189	110	311	0
10	1	18	0	70	39	432	0	130	2	152	0	190	19	201	0
11	1	5	0	71	50	352	0	131	1	55	0	191	80	374	0
12	6626	8201	0	72	13	113	0	132	11	197	0	192	21	224	0
13	1	10	0	73	21	381	0	133	0	0	0	193	167	761	1
14	16	55	0	74	5	8	0	134	0	0	0	194	73	271	0
15	1	1	0	75	45	154	0	135	0	0	0	195	27	104	1
16	23	941	0	76	146	1633	0	136	4	79	0	196	24	271	1
17	35	3218	0	77	36	410	0	137	0	0	0	197	22	90	1
18	54	1559	0	78	12	98	0	138	96	678	0	198	6	351	0
19	636	41	0	79	36	149	0	139	1	75	0	199	71	296	0
20	1	5	0	80	0	1	0	140	22	165	0	200	35	3133	0
21	0	0	0	81	4	35	1	141	180	209	0	201	70	114	0
22	235	668	0	82	1	0	0	142	0	31	0	202	9	6	0
23	0	208	0	83	3	21	0	143	19	117	0	203	132	101	1
24	14	86	0	84	1	60	0	144	0	0	0	204	19	22	0
25	0	0	0	85	36	455	0	145	0	0	0	205	333**	113	2
26	0	0	0	86	77	145	0	146	11	0	0	206	9**	14	0
27	0	0	0	87	5236	229	0	147	28	781	0	207	143**	17	0
28	1	12	0	88	5	10	0	148	0	7	0	208	226**	9	0
29	10	32	0	89	2	0	0	149	0	3	0	209	2**	0	0
30	4	1	0	90	31	161	0	150	6	164	0	CD A	1***	0	0
31	4	120	0	91	1	0	0	151	78	1426	0	CD B	1***	0	0
32	14	1217	0	92	0	0	0	152	37	337	0	CD C	43***	12	0
33	3	14	0	93	2	15	0	153	45	378	0	CD D	65***	10	0
34	6	177	0	94	1	20	0	154	60	300	0				
35	8	5	0	95	140	2332	1	155	29	1378	0		**obsidian**	**chert**	**grn obs.**
36	11	31	0	96	42	77	0	156	11	388	0	**Total**	**19592**	**81124**	**66**
37	11	242	0	97	1	7	0	157	62	410	1				
38	2	16	0	98	22	56	0	158	62	457	0				
39	77	829	0	99	1	48	0	159	Op not assigned						
40	8	86	0	100	1	2	0	160	56	1269	0				
41	14	2023	0	101	3	3	0	161	8	15	0				
42	3	17	0	102	10	581	0	162	3	54	0				
43	0	0	0	103	3	8282	0	163	7	40	0				
44	0	6	0	104	9	155	0	164	66	318	0				
45	7	5	0	105	2	36	0	165	40	59	1				
46	1	29	0	106	1	11	0	166	11	31	0				
47	15	4	0	107	5	180	0	167	2	22	0				
48	2	494	0	108	14	207	0	168	56	222	0				
49*	227	160	0	109	13	188	0	169	31	84	0				
50	8	759	0	110	8	30	0	170	12	26	0				
51	11	32	0	111	1	35	0	171	210	1325	0				
52	15	726	0	112	0	31	0	172	29	146	0				
53	8	1535	0	113	0	0	0	173	28	96	0				
54	46	53	0	114	0	0	0	174	83	3014	2				
55	1	151	0	115	0	0	0	175	0	4	0				
56	11	3895	0	116	29	61	0	176	1	8	0				
57	26	364	0	117	54	1698	32	177	309	104	1				
58	3	165	0	118	183	473	0	178	65	38	0				
59	38	42	0	119	30	881	0	179	142	985	9				
60	10	92	0	120	0	4	0	180	70	170	0				

**Includes C49D 2015 field season; **2015 field season; ***Obsidian collected during conservation efforts, not included in dissertation analysis*

APPENDIX B

HYPERLINK TO HANDHELD ENERGY DISPERSED PORTABLE XRF CHEMICAL PART PER MILLION DATA FOR ARTIFACTS AND SOURCE SAMPLES http://ufdc.ufl.edu/IR00008319/00001 (see Appendix B worksheet)

APPENDIX C
HYPERLINK TO HANDHELD ENERGY DISPERSED PORTABLE XRF COMPTON PEAK INTENSITY DATA FOR ARTIFACTS AND SOURCES SAMPLES

http://ufdc.ufl.edu/IR00008319/00001 (see Appendix C worksheet)

APPENDIX D
HYPERLINK TO HANDHELD ENERGY DISPERSED PORTABLE X-RAY FLORENCES FILES

http://ufdc.ufl.edu/IR00008322/00001

APPENDIX E
ABBREVIATED OBSIDIAN CATALOG

Catalog Number	Context	Description 1	Description 2	Part	n=
C1A/3-1	constr. fill/refuse	final series	notched blade	distal	1
C1A/5-1	constr. fill/refuse	final series	blade	medial	1
C1B/1-1	constr. fill/refuse	final series	lancet	complete	1
C1B/3-1	SD, but not assigned	final series	lancet	complete	2
C1B/4-2a	SD, but not assigned	final series	blade	medial	3
C1B/7-1	SD, but not assigned	final series	edge-mod. tool	medial	1
C1B/9-1	constr. fill/refuse	fragment	-	various	1
C1B/17-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1B/17-1b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C1B/23-2a	constr. fill/refuse	final series	blade	proximal	1
C1B/23-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C1B/24-1a	constr. fill/refuse	final series	blade	proximal	1
C1B/24-1b	constr. fill/refuse	final series	blade	medial	1
C1B/26-1	constr. fill/refuse	final series	blade	medial	1
C1B/27-1	constr. fill/refuse	final series	blade	medial	1
C1B/29-1	constr. fill/refuse	final series	blade	medial	1
C1C/4-1	constr. fill/refuse	final series	blade	medial	1
C1C/5-1	constr. fill/refuse	final series	blade	medial	1
C1C/6-1	constr. fill/refuse	final series	edge-mod. tool	complete	1
C1C/8-1	constr. fill/refuse	final series	edge-mod. tool	distal	1
C1C/12-1	constr. fill/refuse	final series	blade	medial	1
C1C/18-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1C/22-1	constr. fill/refuse	final series	blade	proximal	1
C1C/27-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1C/30-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1C/30-2a	constr. fill/refuse	final series	blade	proximal	1
C1D/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1E/2-1	constr. fill/refuse	initial series	edge-mod. tool	medial	1
C1E/4-2c	constr. fill/refuse	platform prep flake	-	-	1
C1E/4-2b	constr. fill/refuse	final series	blade	distal	1
C1E/4-2a	constr. fill/refuse	final series	blade	medial	1
C1H/26-2	constr. fill/refuse	final series	blade	proximal	1
C1G/2-14	constr. fill/refuse	final series	edge-mod. tool	medial	3
C1H/11-1a	constr. fill/refuse	final series	blade	medial	1
C1H/11-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1H/19-1	constr. fill/refuse	final series	blade	medial	1
C1H/22-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1H/23-4b	constr. fill/refuse	final series	blade	medial	1
C1H/23-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C1H/24-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C1H/27-3a	SDC1H-2	platform prep flake	-	-	7
C1H/27-4	SDC1H-2	'small' percussion blade	core shaping	-	2
C1H/27-40c	SDC1H-2	final series	blade	complete	1
C1H/27-40b	SDC1H-2	final series	blade	complete	1
C1H/27-40a	SDC1H-2	final series	blade	complete	1
C1H/27-5b	SDC1H-2	distal orientation flake	-	-	2
C1H/27-5a	SDC1H-2	platform prep flake	-	-	3
C1H/27-1c	SDC1H-2	final series	lancet	complete	1
C1H/27-1b	SDC1H-2	final series	lancet	complete	1
C1H/27-1a	SDC1H-2	final series	lancet	distal	1
C1H/27-2	SDC1H-2	flake	-	proximal	1
C1H/27-3b	SDC1H-2	initial series	blade	proximal	5
C1H/27-3c	SDC1H-2	fragment	-	various	38
C1H/27-35a	SDC1H-2	final series	blade	complete	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C1H/27-6c	SDC1H-2	final series	blade	proximal	1
C1H/27-6b	SDC1H-2	final series	blade	medial	2
C1H/27-6e	SDC1H-2	initial series	blade	complete	6
C1H/27-6d	SDC1H-2	initial series	blade	medial	10
C1H/27-6a	SDC1H-2	initial series	blade	proximal	14
C2A/1-3	constr. fill/refuse	fragment	edge-mod	-	1
C2A/6-2	constr. fill/refuse	'small' percussion flake	core shaping	-	1
C2A/8-3	constr. fill/refuse	bidirectional core	-	complete	1
C2A/8-2	constr. fill/refuse	final series	blade	medial	1
C2A/11-1b	constr. fill/refuse	final series	blade	medial	1
C2A/11-7	constr. fill/refuse	final series	point	complete	1
C2A/11-1a	constr. fill/refuse	final series	blade	complete	1
C2A/14-1	constr. fill/refuse	final series	blade	medial	2
C2C/3-6	constr. fill/refuse	final series	blade	medial	1
C2F/2-2	constr. fill/refuse	final series	blade	medial	1
C2F/3-1	constr. fill/refuse	initial series	edge-mod. tool	proximal	1
C2F/4-1	constr. fill/refuse	final series	blade	medial	1
C3B/3-12b	constr. fill/refuse	flake	-	-	2
C3B/3-12a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C3B/4-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C3B/4-1c	constr. fill/refuse	final series	blade	distal	1
C3B/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C3B/4-1d	constr. fill/refuse	fragment	-	-	1
C3B/4-1a	constr. fill/refuse	final series	blade	medial	2
C3B/5-1a	constr. fill/refuse	final series	blade	complete	1
C3C/5-2a	SDC3C-6	final series	blade	complete	8
C3C/5-3a	constr. fill/refuse	final series	blade	proximal	1
C3C/6-1a	SDC3C-2	final series	drilled blade	complete	1
C3C/6-2a	SDC3C-2	final series	notched blade	complete	3
C3C/6-3a	SDC3C-2	final series	dilled blade	complete	1
C3C/6-4a	SDC3C-2	final series	blade	plunging complete	2
C3C/9-5a	SDC3C-3	final series	blade	prox/med	1
C3C/12-3a	SDC3C-5	object from blade core frag	scraper	complete	1
C3C/12-2	SDC3C-5	objects from exhausted core	eccentric	medial/lateral	1
C3C/15-2a	SDC3C-1	final series	drilled blade	prox/med	1
C3C/15-3a	SDC3C-1	final series	lancet	complete	1
C3C/15-4a	SDC3C-1	final series	edge-mod. tool	distal	1
C3C/15-5a	SDC3C-1	final series	blade	prox/med	1
C3D/2-1a	constr. fill/refuse	final series	blade	medial	1
C4A/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4B/7-1	constr. fill/refuse	final series	blade	proximal	1
C4B/8-1b	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C4B/8-1a	constr. fill/refuse	final series	blade	medial	1
C4B/9-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4B/10-1	constr. fill/refuse	final series	blade	proximal	1
C4B/13-1	constr. fill/refuse	final series	blade	plunging distal	1
C4B/19-1	constr. fill/refuse	final series	blade	proximal	1
C4B/26-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4B/26-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4B/26-10	constr. fill/refuse	blade-core frag (non-rejuv)	edge-mod. tool	medial/lateral	1
C4B/26-5a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4B/26-5b	constr. fill/refuse	final series	blade	medial	1
C4B/32-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4B/45-25	constr. fill/refuse	final series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C4B/47-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4C/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C4C/7-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4C/10-2	SDC4C-1	final series	blade	medial	1
C4C/11-1	constr. fill/refuse	final series	blade	proximal	1
C4C/12-1b	SDC4C-1	final series	blade	medial	1
C4C/12-1a	SDC4C-1	final series	blade	proximal	1
C4C/13-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4C/13-1b	constr. fill/refuse	final series	blade	proximal	2
C4C/13-1c	constr. fill/refuse	final series	blade	medial	2
C4C/15-1b	SDC4C-2	final series	edge-mod. tool	proximal	1
C4C/15-1a	SDC4C-2	final series	blade	proximal	2
C4C/16-1	constr. fill/refuse	flake	fragment	-	1
C4C/17-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C4C/17-2b	constr. fill/refuse	initial series	blade	complete and fragments	21
C4C/17-2c	constr. fill/refuse	fragment	-	-	2
C4C/18-1e	constr. fill/refuse	macroflake	core shaping	-	1
C4C/18-1d	constr. fill/refuse	initial series	blade	proximal	1
C4C/18-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4C/18-1c	constr. fill/refuse	final series	blade	distal	1
C4C/18-1b	constr. fill/refuse	final series	blade	proximal	2
C4C/19-3c	constr. fill/refuse	blade-core frag (non-rejuv)	-	distal/ lateral	1
C4C/19-3e	constr. fill/refuse	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4C/19-3k	constr. fill/refuse	distal orientation flake	-	-	3
C4C/19-3a	constr. fill/refuse	macroflake	core shaping	-	1
C4C/19-3j	constr. fill/refuse	initial series	blade	complete and fragments	46
C4C/19-3d	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C4C/19-3g	constr. fill/refuse	platform prep flake	-	-	1
C4C/19-3f	constr. fill/refuse	final series	blade	distal	2
C4C/19-3b	constr. fill/refuse	final series	blade	proximal	2
C4C/19-3i	constr. fill/refuse	flake	blade-core frag?	-	1
C4C/19-3l	constr. fill/refuse	flake	-	-	3
C4C/19-3h	constr. fill/refuse	fragment	-	-	1
C4C/21-25a	SDC4C-3	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4C/21-25c	SDC4C-3	final series	blade	medial	1
C4C/21-25b	SDC4C-3	initial series	blade	complete	6
C4C/21-26b	SDC4C-3	initial series	blade	medial	1
C4C/21-26c	SDC4C-3	initial series	blade	distal	3
C4C/21-26a	SDC4C-3	initial series	blade	complete	3
C4C/21-26d	SDC4C-3	fragment	-	-	4
C4E/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4E/17-1	constr. fill/refuse	final series	blade	prox/med	1
C4E/18-8	constr. fill/refuse	final series	edge-mod. tool	medial	2
C4E/19-1	constr. fill/refuse	final series	blade	prox/med	1
C4E/19-2	constr. fill/refuse	fragment	-	-	1
C4E/23-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C4E/23-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C4E/25-15	SDC4E-2	object from blade core frag	edge-mod. tool	proximal/ lateral	1
C4E/25-16	constr. fill/refuse	final series	blade	proximal	1
C4E/26-1a	SDC4E-3	object from blade core frag	eccentric	distal/ lateral	1
C4E/26-1b	SDC4E-3	object from blade core frag	uniface	lateral	1
C4E/26-1c	SDC4E-3	object from blade core frag	eccentric	proximal/ lateral	1
C4E/26-1d	SDC4E-3	object from blade core frag	eccentric	medial/lateral	1
C4E/26-2a	SDC4E-3	object from blade core frag	eccentric	distal/ lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C4E/26-2b	SDC4E-3	object from blade core frag	uniface	complete	1
C4E/26-2c	SDC4E-3	object from blade core frag	eccentric	distal/medial	1
C4E/26-2d	SDC4E-3	object from blade core frag	eccentric	distal/medial	1
C4E/26-5	SDC4E-3	fragment	-	-	1
C4E/26-4	SDC4E-3	final series	blade	proximal	1
C4E/28-3	SDC4E-5	final series	edge-mod. tool	prox/med	1
C4E/30-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C4E/30-1b	constr. fill/refuse	final series	blade	distal	1
C4E/33-2	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial	1
C4E/33-1	constr. fill/refuse	final series	blade	distal	1
C4E/34-1a	SDC4E-9	blade-core frag (non-rejuv)	-	medial/lateral	1
C4E/34-1b	SDC4E-9	blade-core frag (non-rejuv)	-	distal/ lateral	1
C4E/34-1d	SDC4E-9	blade-core frag (non-rejuv)	-	medial/lateral	1
C4E/34-1e	SDC4E-9	blade-core frag (non-rejuv)	-	medial	1
C4E/34-1f	SDC4E-9	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4E/34-1g	SDC4E-9	blade-core frag (non-rejuv)	-	distal/ lateral	1
C4E/34-1h	SDC4E-9	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4E/34-1i	SDC4E-9	blade-core frag (non-rejuv)	-	distal/ lateral	1
C4E/34-1c	SDC4E-9	striated core-top fragment	-	-	1
C4E/34-2a	SDC4E-9	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4E/34-2b	SDC4E-9	blade-core frag (non-rejuv)	-	distal/ lateral	1
C4E/34-2c	SDC4E-9	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4E/34-2d	SDC4E-9	blade-core frag (non-rejuv)	-	distal/ lateral	1
C4E/34-3d	SDC4E-9	blade-core frag (non-rejuv)	-	medial/lateral	1
C4E/34-3a	SDC4E-9	macroflake	core shaping	-	1
C4E/34-3b	SDC4E-9	macroflake with cortex	core shaping	-	1
C4E/34-4	SDC4E-9	objects from exhausted core	eccentric	complete	1
C4E/34-5a	SDC4E-9	object from blade core frag	uniface	distal/ lateral	1
C4E/34-5b	SDC4E-9	object from blade core frag	-	medial	1
C4E/34-6	SDC4E-9	object from blade core frag	eccentric	distal/medial	1
C4E/34-3c	SDC4E-9	final series	blade	complete	1
C4E/34-3e	SDC4E-9	blade-core frag (non-rejuv)	-	medial/lateral	1
C4E/35-1	SDC4E-9?	object from blade core frag	eccentric	distal/medial	1
C4E/35-2a	SDC4E-9?	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4E/35-2b	SDC4E-9?	blade-core frag (non-rejuv)	-	distal	1
C4E/35-2c	SDC4E-9?	blade-core frag (non-rejuv)	-	distal/ lateral	1
C4E/35-3a	SDC4E-9?	blade-core frag (non-rejuv)	-	medial/lateral	1
C4E/35-3b	SDC4E-9?	blade-core frag (non-rejuv)	-	medial/lateral	1
C4E/35-3c	SDC4E-9?	blade-core frag (non-rejuv)	-	medial/lateral	1
C4E/36-1	constr. fill/refuse	final series	blade	medial	1
C4F/13-1	SDC4F-1	object from blade core frag	eccentric	indeterminate	1
C4F/14-6a	constr. fill/refuse	final series	blade	proximal	2
C4F/14-6c	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4F/14-6d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C4F/14-6b	constr. fill/refuse	final series	blade	medial	4
C4F/14-8	constr. fill/refuse	final series	blade	distal	1
C4F/14-8	constr. fill/refuse	flake	-	-	2
C4F/15-10	SDC4F-1	object from blade core frag	eccentric	distal/ lateral	1
C4F/15-12	SDC4F-1	final series	blade	prox/med	1
C4F/15-4	SDC4F-1	flake	-	complete	1
C4F/15-8a	SDC4F-1	object from blade core frag	eccentric	distal	1
C4F/15-8b	SDC4F-1	object from blade core frag	edge-mod. tool	distal/ lateral	1
C4F/15-9a	SDC4F-1	object from blade core frag	edge-mod. tool	medial/lateral	1
C4F/15-9b	SDC4F-1	object from blade core frag	uniface	medial/lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C4F/15-9c	SDC4F-1	object from blade core frag	uniface	medial/lateral	1
C4F/15-9d	SDC4F-1	object from blade core frag	eccentric	distal/ lateral	1
C4F/15-1	SDC4F-1	final series	blade	proximal	1
C4F/17-4	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4F/19-1	constr. fill/refuse	final series	blade	medial	1
C4F/31-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4H/4-18	constr. fill/refuse	final series	blade	medial	1
C4H/5-12	SDC4H-1	final series	blade	medial	1
C4H/5-2	SDC4H-1	final series	blade	medial	3
C4H/5-26	SDC4H-1	final series	blade	prox/med	1
C4I/3-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4I/4-1	constr. fill/refuse	final series	blade	proximal	1
C4I/7-32c	constr. fill/refuse	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C4I/7-32a	constr. fill/refuse	final series	blade	proximal	1
C4I/7-32b	constr. fill/refuse	flake	-	-	1
C4I/7-7b	constr. fill/refuse	final series	blade	medial	1
C4I/7-7c	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C4I/7-7a	constr. fill/refuse	final series	blade	proximal	1
C4I/7-8	constr. fill/refuse	flake	-	-	4
C5B/2-1	SDC5B-1	final series	blade	prox/med	1
C5B/5-3	constr. fill/refuse	final series	blade	medial	1
C5C/9-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C5C/12-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C5E/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C5E/6-5	constr. fill/refuse	fragment	-	-	1
C5E/9-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C5E/10-3b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C5E/10-3c	constr. fill/refuse	fragment	-	-	1
C5E/10-3a	constr. fill/refuse	final series	blade	proximal	1
C5F/8-5a	constr. fill/refuse	final series	blade	prox/med	1
C5F/8-5b	constr. fill/refuse	final series	blade	medial	1
C6B/1-4c	constr. fill/refuse	point	biface	distal	1
C6B/1-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C6B/1-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C6B/4-1a	constr. fill/refuse	exhausted core	-	proximal/medial	1
C6B/4-2a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C6B/4-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C6B/4-3b	constr. fill/refuse	final series	blade	medial	2
C6B/6-1b	SDC6B-1	final series	blade	medial	1
C6B/6-1a	SDC6B-1	final series	edge-mod. tool	medial	2
C6B/6-2a	SDC6B-1	final series	blade	medial	1
C6B/6-3a	SDC6B-1	final series	blade	proximal	1
C6B/6-6a	SDC6B-1	final series	edge-mod. tool	medial	1
C6B/6-6b	SDC6B-1	final series	blade	medial	1
C6B/6-8a	SDC6B-1	fragment	-	-	1
C6B/6-7a	SDC6B-1	final series	edge-mod. tool	medial	1
C6B/6-9a	SDC6B-1	final series	edge-mod. tool	distal	1
C6B/7-1a	SDC6B-1	final series	blade	proximal	1
C6B/7-1b	SDC6B-1	final series	edge-mod. tool	medial	2
C6B/7-1c	SDC6B-1	fragment	-	-	1
C6B/8-2a	SDC6B-4	final series	edge-mod. tool	proximal	1
C6B/8-2b	SDC6B-4	final series	edge-mod. tool	prox/med	1
C6B/8-3a	SDC6B-4	macroflake	edge-mod lateral	-	1
C6B/8-2c	SDC6B-4	final series	edge-mod. tool	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C6B/8-2d	SDC6B-4	fragment	edge-mod	-	1
C6B/8-3b	SDC6B-4	final series	blade	medial	1
C6B/10-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C6B/10-4b	constr. fill/refuse	final series	blade	proximal	1
C6B/10-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C6B/10-4c	constr. fill/refuse	final series	blade	medial	2
C6B/12-1a	constr. fill/refuse	final series	blade	medial	1
C6B/13-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C6B/19-1a	constr. fill/refuse	fragment	-	-	1
C6B/21-1b	constr. fill/refuse	final series	blade	medial	1
C6B/21-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C6B/21-1c	constr. fill/refuse	fragment	-	-	1
C6B/22-1b	constr. fill/refuse	flake	-	-	1
C6B/22-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C6B/22-1a	constr. fill/refuse	final series	blade	prox/med	1
C6B/22-1c	constr. fill/refuse	final series	blade	medial	1
C6B/22-3a	constr. fill/refuse	final series	blade	medial	1
C6B/22-5a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C6B/23-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C6B/24-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C6B/24-1b	constr. fill/refuse	final series	edge-mod. tool	distal	2
C6B/25-1a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C6B/25-2a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C6B/25-3c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C6B/25-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C6B/25-3b	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C6B/25-4a	constr. fill/refuse	final series	edge-mod. tool	medial	5
C6B/26-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C6B/26-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C6B/27-1a	SDC6B-2	final series	edge-mod. tool	proximal	1
C6B/31-2a	constr. fill/refuse	final series	blade	proximal	1
C6B/31-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C6B/31-2b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C6B/35-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C7B/1-2	constr. fill/refuse	initial series	blade	complete	1
C7B/2-1	constr. fill/refuse	initial series	edge-mod. tool	medial	1
C7B/3-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C7B/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C7B/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C7B/8-1a	constr. fill/refuse	final series	blade	medial	1
C7B/8-1b	constr. fill/refuse	fragment	-	-	1
C7B/9-1a	constr. fill/refuse	final series	blade	proximal	1
C7B/9-1b	constr. fill/refuse	final series	blade	medial	1
C7B/11-1a	SDC7B-2	final series	blade	complete	1
C7B/11-1b	SDC7B-2	final series	lancet	med/dist	1
C7B/12-4	SDC7B-1	final series	lancet	medial	2
C7B/23-1	constr. fill/refuse	final series	blade	medial	2
C7B/23-2	constr. fill/refuse	final series	blade	proximal	1
C75H/3-4a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76F/1-8a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C8B/2-1a	constr. fill/refuse	objects from exhausted core	uniface	complete	1
C8B/2-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8B/2-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C8B/7-2a	constr. fill/refuse	final series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C8B/9-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8B/11-1a	constr. fill/refuse	final series	blade	medial	1
C8B/16-4a	constr. fill/refuse	final series	blade	medial	1
C8B/17-1a	constr. fill/refuse	final series	blade	medial	1
C8B/19-1a	constr. fill/refuse	final series	blade	medial	1
C8B/26-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C8B/41-2a	constr. fill/refuse	final series	blade	proximal	1
C8B/41-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8B/67-3a	constr. fill/refuse	final series	blade	medial	1
C8B/69-9a	constr. fill/refuse	final series	blade	distal	1
C8D/5-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8D/7-1a	constr. fill/refuse	final series	blade	medial	1
C8D/10-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8D/23-1a	constr. fill/refuse	final series	blade	medial	2
C8D/31-1a	constr. fill/refuse	final series	blade	prox/med	1
C8D/32-1a	constr. fill/refuse	initial series	edge-mod. tool	medial	1
C8D/34-1a	constr. fill/refuse	final series	blade	proximal	1
C8D/38-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8D/43-2a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C8E/5-1a	constr. fill/refuse	final series	blade	medial	1
C8F/13-9a	constr. fill/refuse	final series	blade	medial	1
C8F/14-9a	constr. fill/refuse	final series	blade	proximal	1
C8F/15-2a	constr. fill/refuse	final series	blade	medial	1
C8F/17-3a	constr. fill/refuse	final series	blade	med/dist	1
C8F/17-1a	constr. fill/refuse	final series	edge-mod. tool	distal	1
C8F/18-2a	constr. fill/refuse	final series	blade	medial	1
C8F/18-1b	constr. fill/refuse	final series	blade	medial	1
C8F/18-1c	constr. fill/refuse	final series	blade	med/dist	1
C8F/18-1a	constr. fill/refuse	final series	blade	proximal	1
C8F/20-5a	constr. fill/refuse	initial series	blade	proximal	1
C8F/20-4a	constr. fill/refuse	final series	blade	medial	1
C8G/1-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C8G/2-2a	constr. fill/refuse	final series	blade	medial	1
C8G/4-2a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C8G/6-1a	constr. fill/refuse	final series	blade	proximal	1
C8J/3-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8J/3-8a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8J/4-4a	constr. fill/refuse	final series	blade	medial	2
C8J/5-1a	constr. fill/refuse	final series	blade	medial	1
C8J/5-1b	constr. fill/refuse	final series	blade	distal	1
C8J/7-8a	constr. fill/refuse	final series	blade	prox/med	1
C8J/7-8b	constr. fill/refuse	final series	blade	distal	1
C8J/7-8c	constr. fill/refuse	blade frag?	blade-core frag?	-	1
C8J/8-5a	constr. fill/refuse	final series	blade	distal	1
C8M/2-4a	constr. fill/refuse	final series	blade	medial	1
C8M/1-6a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8M/1-6b	constr. fill/refuse	fragment	-	-	1
C8N/1-9a	constr. fill/refuse	final series	blade	medial	1
C8N/2-13a	constr. fill/refuse	final series	blade	medial	2
C8N/1-3a	constr. fill/refuse	final series	blade	medial	1
C8N/1-9b	constr. fill/refuse	final series	blade	med/dist	1
C8N/2-8a	constr. fill/refuse	fragment	-	-	1
C8O/2-10a	constr. fill/refuse	point	biface	medial	1
C8O/2-11a	constr. fill/refuse	final series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C8O/2-12a	constr. fill/refuse	fragment	macroflake frag?	-	1
C8O/2-7a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C8O/2-8a	constr. fill/refuse	final series	blade	medial	1
C8O/2-9a	constr. fill/refuse	final series	blade	medial	1
C8O/3-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8P/1-1a	constr. fill/refuse	'small' percussion blade	core shaping	-	1
C8P/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C8P/3-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8P/4-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C8Q/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C8Q/6-3a	constr. fill/refuse	final series	blade	proximal	1
C8S/4-6b	constr. fill/refuse	final series	blade	distal	1
C8S/4-6a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C8T/1-7a	constr. fill/refuse	final series	blade	medial	1
C9A/1-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	3
C9A/1-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C10A/3-3	constr. fill/refuse	final series	blade	medial	1
C11A/16-1	constr. fill/refuse	final series	blade	distal	1
C12A/45-1d	SDC12A-2	distal orientation flake	-	-	5
C12A/45-1b	SDC12A-2	platform prep flake	-	-	7
C12A/45-1c	SDC12A-2	'small' percussion blade	overhang removal	-	3
C12A/45-1a	SDC12A-2	'small' percussion flake	core shaping	-	6
C12A/45-1g	SDC12A-2	final series	blade	distal	1
C12A/45-1f	SDC12A-2	final series	blade	medial	3
C12A/45-1e	SDC12A-2	initial series	blade	complete and fragments	15
C12A/47-1q	SDC12A-2	bidirectional core	core section	distal	1
C12A/47-1n	SDC12A-2	blade-core frag (non-rejuv)	core section	proximal/ lateral	3
C12A/47-1o	SDC12A-2	blade-core frag (non-rejuv)	core section	distal	2
C12A/47-1p	SDC12A-2	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C12A/47-1r	SDC12A-2	blade-core frag (non-rejuv)	core section	medial	1
C12A/47-1s	SDC12A-2	blade-core frag (non-rejuv)	core section	lateral	11
C12A/47-1h	SDC12A-2	core section flake	-	-	15
C12A/47-1bb	SDC12A-2	core section flake	scraper	-	1
C12A/47-1g	SDC12A-2	cortical core-top fragment	-	-	30
C12A/47-1k	SDC12A-2	distal orientation flake	-	-	97
C12A/47-1d	SDC12A-2	faceted core-top fragment	-	-	23
C12A/47-1e	SDC12A-2	faceted/striated core-top fragment	-	-	19
C12A/47-1l	SDC12A-2	lateral core rejuv	-	-	64
C12A/47-1dd	SDC12A-2	lateral core rejuv	other	-	1
C12A/47-1a	SDC12A-2	macroblade	core shaping	-	1
C12A/47-1hh	SDC12A-2	macroblade	medial notched blade	-	1
C12A/47-1ii	SDC12A-2	macroblade	distal notched blade	-	1
C12A/47-1jj	SDC12A-2	blade-core frag (non-rejuv)	core section	proximal	1
C12A/47-1b	SDC12A-2	macroflake	core shaping	-	152
C12A/47-1c	SDC12A-2	macroflake with cortex	core shaping	-	47
C12A/47-1f	SDC12A-2	pecked ground core-top fragment	-	-	7
C12A/47-1j	SDC12A-2	platform prep flake	-	-	358
C12A/47-1i	SDC12A-2	platform prep flake	-	-	1
C12A/47-1u	SDC12A-2	'small' percussion blade	overhang removal	-	235
C12A/47-1gg	SDC12A-2	'small' percussion blade	core shaping	-	1
C12A/47-1t	SDC12A-2	'small' percussion flake	core shaping	-	615
C12A/47-1cc	SDC12A-2	'small' percussion flake	disk	-	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C12A/47-1ff	SDC12A-2	final series	blade	prox/med	2
C12A/47-1z	SDC12A-2	final series	blade	complete	3
C12A/47-1m	SDC12A-2	final series	blade	plunging distal	55
C12A/47-1w	SDC12A-2	final series	blade	proximal	158
C12A/47-1x	SDC12A-2	final series	blade	medial	254
C12A/47-1y	SDC12A-2	final series	blade	distal	293
C12A/47-1v	SDC12A-2	initial series	blade	complete and fragments	1549
C12A/47-1ee	SDC12A-2	point	biface	proximal	1
C12A/47-1aa	SDC12A-2	various debitage	-	fragment	575
C12A/49-1g	SDC12A-2	bidirectional core	core section	indeterminate	2
C12A/49-1c	SDC12A-2	blade-core frag (non-rejuv)	core section	distal	1
C12A/49-1d	SDC12A-2	blade-core frag (non-rejuv)	core section	medial	1
C12A/49-1e	SDC12A-2	blade-core frag (non-rejuv)	core section	proximal	4
C12A/49-1f	SDC12A-2	blade-core frag (non-rejuv)	core section	lateral	7
C12A/49-1l	SDC12A-2	core section flake	-	-	14
C12A/49-1h	SDC12A-2	cortical core-top fragment	-	-	15
C12A/49-1n	SDC12A-2	distal orientation flake	-	-	155
C12A/49-1i	SDC12A-2	faceted core-top fragment	-	-	7
C12A/49-1j	SDC12A-2	faceted/striated core-top fragment	-	-	19
C12A/49-1o	SDC12A-2	lateral core rejuv	-	-	21
C12A/49-1b	SDC12A-2	macroflake	core shaping	-	33
C12A/49-1a	SDC12A-2	macroflake with cortex	core shaping	-	26
C12A/49-1x	SDC12A-2	objects from exhausted core	edge-mod. tool	complete	1
C12A/49-1cc	SDC12A-2	objects from exhausted core	edge-mod. tool	lateral	1
C12A/49-1ff	SDC12A-2	objects from exhausted core	edge-mod. tool	distal/ lateral	1
C12A/49-1k	SDC12A-2	pecked ground core-top fragment	-	-	15
C12A/49-1m	SDC12A-2	platform prep flake	-	-	256
C12A/49-1dd	SDC12A-2	platform prep flake	disk	-	1
C12A/49-1p	SDC12A-2	'small' percussion blade	overhang removal	-	98
C12A/49-1r	SDC12A-2	'small' percussion flake	core shaping	-	284
C12A/49-1ee	SDC12A-2	final series	edge-mod. tool	plunging distal	1
C12A/49-1bb	SDC12A-2	final series	edge-mod. tool	medial	1
C12A/49-1aa	SDC12A-2	final series	edge-mod. tool	medial	1
C12A/49-1z	SDC12A-2	final series	edge-mod. tool	proximal	2
C12A/49-1y	SDC12A-2	initial series	edge-mod. tool	distal	2
C12A/49-1t	SDC12A-2	final series	blade	complete	5
C12A/49-1v	SDC12A-2	final series	blade	medial	30
C12A/49-1q	SDC12A-2	final series	blade	plunging distal	44
C12A/49-1w	SDC12A-2	final series	blade	distal	47
C12A/49-1u	SDC12A-2	final series	blade	proximal	66
C12A/49-1s	SDC12A-2	initial series	blade	complete and fragments	621
C12A/49-1gg	SDC12A-2	various debitage	-	fragment	205
C12B/1-2a	SDC12A-2	final series	blade	medial	1
C12B/2-2a	SDC12A-2	blade-core frag (non-rejuv)	core section	medial	1
C12B/2-2d	SDC12A-2	final series	blade	distal	1
C12B/2-2c	SDC12A-2	final series	blade	proximal	3
C12B/2-2b	SDC12A-2	initial series	blade	complete and fragments	5
C12B/2-2e	SDC12A-2	various debitage	-	fragment	4
C12B/5-6a	SDC12A-2	final series	blade	medial	1
C12C/2-4	SDC12A-2	final series	blade	medial	1
C12E/13-1	SDC12A-2	final series	blade	medial	1
C12G/11-3	SDC12A-2	final series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C13A/19-1	constr. fill/refuse	fragment	-	-	1
C14A/4-11b	SD, but not assigned	final series	blade	proximal	1
C14A/4-11a	SD, but not assigned	final series	blade	med/dist	1
C14A/5-6a	SD, but not assigned	final series	edge-mod. tool	prox/med	1
C14A/5-6b	SD, but not assigned	final series	blade	distal	1
C14A/6-6a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C14A/12-1	SD, but not assigned	final series	blade	medial	1
C14B/1-6a	SD, but not assigned	blade artifacts	notched blade	complete	1
C14B/1-6c	SD, but not assigned	blade artifacts	notched blade	medial	1
C14B/1-6b	SD, but not assigned	faceted core-top fragment	other	-	1
C14D/2-4	SD, but not assigned	final series	edge-mod. tool	medial	1
C14E/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C16A/12-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C16A/13-4	constr. fill/refuse	'small' percussion flake	core shaping	-	2
C16B/3-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C16B/5-1	constr. fill/refuse	final series	blade	medial	1
C16C/3-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C16C/3-1a	constr. fill/refuse	initial series	blade	proximal	1
C16I/16-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C16J/2-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C16K/7-1	constr. fill/refuse	initial series	blade	complete	1
C16L/19-1	constr. fill/refuse	initial series	blade	prox/med	1
C16R/9-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C16R/9-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C16T/1-5	constr. fill/refuse	flake	-	-	1
C16T/2-6	constr. fill/refuse	final series	edge-mod. tool	medial	2
C17C/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C17C/19-8c	constr. fill/refuse	final series	blade	prox/med	1
C17C/19-8a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C17C/19-8b	constr. fill/refuse	final series	blade	medial	2
C17C/25-3	constr. fill/refuse	final series	blade	proximal	1
C17C/29-1a	constr. fill/refuse	final series	blade	medial	2
C17C/29-1b	constr. fill/refuse	fragment	-	-	2
C17D/8-4	constr. fill/refuse	final series	blade	proximal	1
C17D/11-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C17D/12-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C17D/12-2c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C17D/12-2b	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C17D/20-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C17D/20-1b	constr. fill/refuse	final series	edge-mod. tool	distal	2
C17D/21-1a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C17D/21-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C17E/2-1	constr. fill/refuse	final series	blade	medial	1
C17F/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C17P/13-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C17K/4-3	constr. fill/refuse	final series	blade	medial	1
C17K/12-5	constr. fill/refuse	final series	edge-mod. tool	medial	1
C17K/37-1	constr. fill/refuse	'small' percussion flake	core shaping	-	1
C17K/40-1	constr. fill/refuse	initial series	edge-mod. tool	proximal	1
C17K/43-1a	constr. fill/refuse	final series	blade	proximal	1
C17K/43-1b	constr. fill/refuse	fragment	-	-	1
C17O/4-2	constr. fill/refuse	final series	blade	medial	1
C17P/4-7	constr. fill/refuse	final series	blade	proximal	1
C17P/15-5	constr. fill/refuse	final series	blade	proximal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C17P/16-21	constr. fill/refuse	final series	edge-mod. tool	medial	1
C17P/33-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C17Q/21-5	constr. fill/refuse	final series	blade	distal	1
C18A/8-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18A/10-1	constr. fill/refuse	final series	blade	medial	1
C18B/5-1a	constr. fill/refuse	final series	blade	proximal	1
C18B/5-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18B/15-1	constr. fill/refuse	final series	blade	medial	1
C18B/20-1	constr. fill/refuse	fragment	-	proximal	1
C18B/23-1	constr. fill/refuse	final series	blade	distal	1
C18B/33-2	constr. fill/refuse	final series	blade	proximal	1
C18C/5-1	constr. fill/refuse	final series	blade	distal	1
C18C/11-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C18C/11-1b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C18C/15-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C18C/15-3b	constr. fill/refuse	fragment	-	-	1
C18D/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18D/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18D/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18D/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C18D/11-1	constr. fill/refuse	fragment	-	proximal	1
C18E/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C18F/3-1	constr. fill/refuse	initial series	blade	medial	1
C18F/5-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18F/6-1	constr. fill/refuse	fragment	-	-	1
C18G/7-2	constr. fill/refuse	final series	blade	medial	1
C18G/8-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C18G/8-1b	constr. fill/refuse	final series	blade	medial	1
C18G/11-1	constr. fill/refuse	final series	blade	plunging distal	1
C18G/12-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18G/12-1b	constr. fill/refuse	final series	blade	distal	1
C18H/12-2	SDC18G-1	initial series	blade	proximal	1
C18N/1-5	constr. fill/refuse	final series	blade	prox/med	1
C18N/15-4	constr. fill/refuse	final series	blade	medial	1
C18N/17-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C18N/18-5	constr. fill/refuse	final series	blade	medial	1
C18N/18-7	constr. fill/refuse	final series	blade	distal	1
C18N/27-2a	constr. fill/refuse	final series	blade	prox/med	1
C18N/27-2b	constr. fill/refuse	fragment	-	-	1
C18N/32-1a	constr. fill/refuse	final series	blade	proximal	1
C18N/32-1b	constr. fill/refuse	fragment	-	-	1
C18T/7-9	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C18U/3-6	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C18U/9-9	constr. fill/refuse	macroflake	core shaping	-	1
C18U/14-5	constr. fill/refuse	macroflake	core shaping	-	1
C19A/6-1a	constr. fill/refuse	final series	blade	proximal	1
C19A/6-1b	constr. fill/refuse	fragment	-	-	1
C19A/8-1	constr. fill/refuse	initial series	blade	proximal	1
C19A/21-1a	constr. fill/refuse	blade-core frag (non-rejuv)	-	proximal/ lateral	2
C19A/21-1b	constr. fill/refuse	final series	blade	proximal	1
C19A/21-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C19A/24-1	constr. fill/refuse	macroflake	core shaping	-	1
C19A/25-1h	SDC19A-2	bidirectional core	-	complete	1
C19A/25-1m	SDC19A-2	bidirectional core frag	-	distal	2

Catalog Number	Context	Description 1	Description 2	Part	n=
C19A/25-1i	SDC19A-2	blade-core frag (non-rejuv)	-	lateral	1
C19A/25-1j	SDC19A-2	blade-core frag (non-rejuv)	-	proximal	1
C19A/25-1k	SDC19A-2	blade-core frag (non-rejuv)	-	medial	4
C19A/25-1l	SDC19A-2	blade-core frag (non-rejuv)	-	medial/lateral	25
C19A/25-1n	SDC19A-2	blade-core frag (non-rejuv)	-	distal	2
C19A/25-1q	SDC19A-2	blade-core frag (non-rejuv)	-	medial/lateral	1
C19A/25-1r	SDC19A-2	blade-core frag (non-rejuv)	-	medial	1
C19A/25-1v	SDC19A-2	distal orientation flake	-	-	4
C19A/25-1t	SDC19A-2	indeterminate core-top fragment	-	-	4
C19A/25-1a	SDC19A-2	macroflake	core shaping	-	14
C19A/25-1b	SDC19A-2	macroflake with cortex	core shaping	-	5
C19A/25-1s	SDC19A-2	platform prep flake	-	-	33
C19A/25-1c	SDC19A-2	'small' percussion blade	core shaping	-	2
C19A/25-1f	SDC19A-2	final series	blade	proximal	8
C19A/25-1o	SDC19A-2	blade-core frag (non-rejuv)	-	distal	4
C19A/25-1p	SDC19A-2	blade-core frag (non-rejuv)	-	indeterminate	8
C19A/25-1w	SDC19A-2	core section flake	-	-	13
C19A/25-1u	SDC19A-2	indeterminate rejuv debitage	-	-	3
C19A/25-1e	SDC19A-2	final series	blade	complete	1
C19A/25-1g	SDC19A-2	final series	blade	medial	5
C19A/25-1d	SDC19A-2	initial series	blade	complete and fragments	192
C19A/25-1x	SDC19A-2	fragment	-	-	89
C19A/27-1	constr. fill/refuse	initial series	blade	complete	1
C19A/28-5j	SDC19A-2	blade-core frag (non-rejuv)	-	medial/lateral	7
C19A/28-5k	SDC19A-2	blade-core frag (non-rejuv)	-	proximal/ lateral	5
C19A/28-5l	SDC19A-2	blade-core frag (non-rejuv)	-	medial	1
C19A/28-5o	SDC19A-2	core section flake	-	-	1
C19A/28-5n	SDC19A-2	distal orientation flake	-	-	5
C19A/28-5f	SDC19A-2	macroblade with cortex	core shaping	-	9
C19A/28-5e	SDC19A-2	macroflake with cortex	core shaping	-	1
C19A/28-5m	SDC19A-2	platform prep flake	-	-	9
C19A/28-5d	SDC19A-2	final series	blade	complete	1
C19A/28-5h	SDC19A-2	final series	blade	prox/med	1
C19A/28-5i	SDC19A-2	final series	blade	medial	1
C19A/28-5c	SDC19A-2	final series	blade	med/dist	2
C19A/28-5b	SDC19A-2	final series	blade	prox/med	3
C19A/28-5a	SDC19A-2	final series	blade	complete	6
C19A/28-5g	SDC19A-2	initial series	blade	complete and fragments	113
C19A/28-5p	SDC19A-2	fragment	-	-	12
C19A/28-6a	SDC19A-2	final series	edge-mod. tool	proximal	1
C19A/28-6b	SDC19A-2	final series	edge-mod. tool	med/dist	1
C19A/33-1b	constr. fill/refuse	final series	blade	distal	1
C19A/33-1a	constr. fill/refuse	initial series	blade	complete and fragments	8
C19A/34-1	constr. fill/refuse	final series	blade	prox/med	2
C19A/39-5	constr. fill/refuse	final series	blade	medial	1
C20A/1-1	constr. fill/refuse	final series	blade	prox/med	1
C22A/1-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C22A/1-4b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22A/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22A/4-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C22A/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22A/5-1	constr. fill/refuse	initial series	blade	proximal	1
C22A/5-3	constr. fill/refuse	final series	edge-mod. tool	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C22A/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22A/7-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22A/7-1c	constr. fill/refuse	final series	blade	proximal	1
C22A/7-1b	constr. fill/refuse	final series	blade	medial	2
C22A/8-2a	constr. fill/refuse	final series	other	medial	1
C22A/8-2d	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C22A/8-2c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22A/8-2b	constr. fill/refuse	final series	blade	medial	3
C22A/9-1d	constr. fill/refuse	macroflake	edge-mod	-	1
C22A/9-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22A/9-1a	constr. fill/refuse	final series	blade	proximal	1
C22A/9-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22A/10-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C22A/10-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C22A/10-1c	constr. fill/refuse	final series	blade	medial	5
C22A/12-1e	constr. fill/refuse	final series	blade	distal	1
C22A/12-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	3
C22A/12-1c	constr. fill/refuse	final series	blade	proximal	3
C22A/12-1d	constr. fill/refuse	final series	blade	medial	4
C22A/12-1b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C22A/12-1f	constr. fill/refuse	fragment	-	-	1
C22A/14-1	constr. fill/refuse	fragment	-	-	1
C22A/15-3f	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C22A/15-3e	constr. fill/refuse	final series	drill	distal	1
C22A/15-3h	constr. fill/refuse	initial series	edge-mod. tool	medial	1
C22A/15-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C22A/15-3b	constr. fill/refuse	final series	blade	proximal	3
C22A/15-3d	constr. fill/refuse	final series	blade	medial	3
C22A/15-3g	constr. fill/refuse	final series	edge-mod. tool	distal	3
C22A/15-3c	constr. fill/refuse	final series	edge-mod. tool	medial	4
C22A/17-2a	constr. fill/refuse	final series	blade	proximal	1
C22A/17-2b	constr. fill/refuse	final series	blade	medial	2
C22A/17-2c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22A/20-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C22A/22-1a	constr. fill/refuse	final series	blade	proximal	1
C22A/22-1b	constr. fill/refuse	final series	blade	medial	2
C22A/24-1	constr. fill/refuse	final series	blade	proximal	1
C22A/25-1	constr. fill/refuse	final series	blade	distal	1
C22A/26-2	constr. fill/refuse	final series	blade	medial	1
C22A/27-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22A/27-1a	constr. fill/refuse	final series	blade	proximal	1
C22A/27-1c	constr. fill/refuse	fragment	-	-	1
C22A/28-2a	SDC22A-1	final series	blade	medial	1
C22A/28-2b	SDC22A-1	fragment	-	-	2
C22A/30-1	constr. fill/refuse	final series	blade	medial	1
C22A/31-2	constr. fill/refuse	final series	blade	medial	1
C22A/36-1	constr. fill/refuse	final series	blade	medial	2
C22B/2-1c	constr. fill/refuse	macroflake	edge-mod	-	1
C22B/2-1b	constr. fill/refuse	final series	blade	medial	2
C22B/2-1a	constr. fill/refuse	final series	blade	proximal	2
C22B/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22B/4-1a	constr. fill/refuse	final series	blade	proximal	2
C22C/2-1a	constr. fill/refuse	initial series	blade	complete and fragments	2
C22C/2-1b	constr. fill/refuse	final series	blade	medial	2

Catalog Number	Context	Description 1	Description 2	Part	n=
C22C/5-1b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22C/5-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C22C/6-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C22C/6-1b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C22C/6-1c	constr. fill/refuse	final series	edge-mod. tool	medial	5
C22C/7-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C22C/7-1b	constr. fill/refuse	final series	blade	proximal	1
C22C/7-1d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C22C/7-1c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C22C/8-2d	constr. fill/refuse	final series	blade	distal	1
C22C/8-2a	constr. fill/refuse	final series	point	proximal	1
C22C/8-2b	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C22C/8-2c	constr. fill/refuse	final series	edge-mod. tool	medial	5
C22C/9-2d	constr. fill/refuse	final series	blade	plunging distal	1
C22C/9-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C22C/9-2c	constr. fill/refuse	final series	edge-mod. tool	medial	7
C22C/9-2a	constr. fill/refuse	final series	blade	proximal	3
C22C/11-3e	constr. fill/refuse	bidirectional core frag	-	distal	1
C22C/11-3c	constr. fill/refuse	final series	edge-mod. tool	medial	5
C22C/11-3b	constr. fill/refuse	final series	blade	proximal	2
C22C/11-3d	constr. fill/refuse	final series	blade	medial	3
C22C/11-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	4
C22C/11-3f	constr. fill/refuse	fragment	-	-	3
C22C/13-2c	constr. fill/refuse	final series	blade	medial	1
C22C/13-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C22C/13-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22C/14-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C22C/15-1c	constr. fill/refuse	final series	other	medial	1
C22C/15-1b	constr. fill/refuse	final series	blade	medial	1
C22C/15-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	4
C22D/1-1a	constr. fill/refuse	final series	blade	proximal	1
C22D/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C22E/1-1	constr. fill/refuse	flake	-	-	1
C22E/2-5	constr. fill/refuse	final series	blade	medial	1
C22E/7-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22E/16-2	constr. fill/refuse	final series	blade	proximal	1
C22E/19-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C22E/20-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22E/23-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22E/24-1d	constr. fill/refuse	flake	-	-	2
C22E/24-1e	constr. fill/refuse	distal orientation flake	-	-	1
C22E/24-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C22E/24-1b	constr. fill/refuse	final series	blade	medial	2
C22E/24-1c	constr. fill/refuse	final series	blade	distal	2
C22E/28-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22E/29-3	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C22E/30-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22F/1-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C22F/1-3b	constr. fill/refuse	final series	blade	medial	3
C22F/1-4a	constr. fill/refuse	final series	blade	medial	2
C22F/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C22F/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C22F/4-6	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22F/5-7a	constr. fill/refuse	final series	edge-mod. tool	proximal	2

Catalog Number	Context	Description 1	Description 2	Part	n=
C22F/5-4	constr. fill/refuse	fragment	-	-	3
C22F/5-7b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C22F/6-3	constr. fill/refuse	final series	blade	medial	1
C22F/7-2a	constr. fill/refuse	final series	blade	proximal	2
C22F/7-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C22F/7-2c	constr. fill/refuse	fragment	-	-	5
C22F/7-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C24B/4-3	SD, but not assigned	final series	blade	medial	2
C24B/5-2	SD, but not assigned	final series	edge-mod. tool	medial	2
C24C/2-1c	SD, but not assigned	final series	edge-mod. tool	medial	1
C24C/2-1b	SD, but not assigned	final series	blade	proximal	1
C24C/2-1a	SD, but not assigned	final series	blade	complete	1
C24C/3-15	SD, but not assigned	final series	blade	prox/med	1
C24C/3-2	SD, but not assigned	final series	blade	prox/med	1
C24C/3-24	SD, but not assigned	fragment	-	-	1
C24D/1-4	SD, but not assigned	exhausted core	-	complete	1
C24D/1-5	SD, but not assigned	final series	blade	prox/med	1
C28A/4-7	constr. fill/refuse	final series	blade	proximal	1
C29A/1-2	constr. fill/refuse	final series	blade	medial	1
C29A/3-2	constr. fill/refuse	final series	blade	medial	1
C29A/6-5	SDC29A-2	final series	blade	prox/med	1
C29A/6-7a	SDC29A-2	final series	blade	proximal	1
C29A/6-7c	SDC29A-2	final series	blade	distal	2
C29A/6-7b	SDC29A-2	final series	edge-mod. tool	medial	2
C29A/7-6a	SDC29A-1	final series	inlay	complete	1
C29A/7-6b	SDC29A-1	fragment	-	-	1
C30B/2-1b	SD, but not assigned	macroflake	core shaping	-	1
C30B/2-1a	SD, but not assigned	macroflake with cortex	core shaping	-	1
C30B/2-2a	SD, but not assigned	final series	edge-mod. tool	complete	1
C30B/2-2b	SD, but not assigned	final series	blade	proximal	1
C31B/7-1a	SDC31B-2	object from core rejuv debitage	disk	-	1
C31B/7-2	SDC31B-2	final series	blade	medial	1
C31C/2-2	constr. fill/refuse	final series	blade	medial	1
C31D/1-2	constr. fill/refuse	final series	blade	medial	1
C31D/3-3	constr. fill/refuse	final series	notched blade	medial	1
C32A/1-1	constr. fill/refuse	final series	blade	medial	1
C32A/4-1	SDC32A-1	macroblade	drill	-	1
C32A/4-5a	SDC32A-2	initial series	blade	prox/med	1
C32A/4-5b	SDC32A-2	final series	edge-mod. tool	medial	2
C32B/5-18a	SDC32B-1	final series	blade	medial	1
C32B/5-18	SDC32B-1	final series	edge-mod. tool	medial	1
C32C/2-8	constr. fill/refuse	initial series	blade	medial	2
C32C/4-5a	SDC32C-1	blade-core frag (non-rejuv)	other	distal	2
C32C/4-5b	SDC32C-1	core section flake	fragment	-	8
C32C/4-5c	SDC32C-1	platform prep flake	fragment	-	3
C32C/4-5e	SDC32C-1	final series	blade	distal	1
C32C/4-5d	SDC32C-1	flake	-	complete	1
C32C/4-1	SDC32C-1	platform prep flake	-	-	5
C32C/6-3	SDC32C-2	final series	blade	medial	1
C32C/6-8b	SDC32C-2	final series	edge-mod. tool	medial	1
C32C/6-8a	SDC32C-2	flake	edge-mod	-	1
C32C/7-6a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C32C/7-6b	constr. fill/refuse	final series	blade	proximal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C32C/8-3	constr. fill/refuse	final series	blade	distal	1
C32C/8-3a	constr. fill/refuse	final series	blade	medial	1
C33B/3-2	SDC33B-1	final series	blade	proximal	1
C34B/2-1	constr. fill/refuse	final series	blade	medial	1
C34B/7-2	constr. fill/refuse	final series	blade	medial	2
C34C/2-1	constr. fill/refuse	final series	blade	distal	1
C34C/4-1b	constr. fill/refuse	initial series	edge-mod. tool	distal	1
C34C/4-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C35A/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C35A/7-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C35A/9-1	SDC35A-1	final series	blade	medial	1
C35B/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C35D/1-1	constr. fill/refuse	final series	blade	proximal	1
C36A/2-15a	SDC36A-1	final series	edge-mod. tool	medial	2
C36A/2-5	SDC36A-1	final series	edge-mod. tool	prox/med	1
C36A/2-15b	SDC36A-1	platform prep flake	-	-	1
C36A/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C36B/4-5	SDC36B-1	final series	blade	proximal	1
C36B/7-1	constr. fill/refuse	initial series	edge-mod. tool	proximal	2
C36A/1-3	constr. fill/refuse	final series	blade	proximal	1
C37B/9-1	constr. fill/refuse	final series	blade	medial	1
C37B/9-2	constr. fill/refuse	final series	blade	medial	1
C37B/13-1	constr. fill/refuse	objects from exhausted core	edge-mod. tool	proximal/ lateral	1
C37B/44-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C37B/44-1b	constr. fill/refuse	final series	blade	distal	1
C37C/7-7	constr. fill/refuse	final series	blade	medial	1
C37C/11-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C37C/30-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C37G/2-1	constr. fill/refuse	final series	blade	medial	1
C38B/1-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C38C/12-1	constr. fill/refuse	final series	blade	proximal	1
C39A/1-1a	constr. fill/refuse	final series	blade	distal	1
C39A/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C39A/5-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C39A/5-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C39A/7-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C39A/7-1c	constr. fill/refuse	final series	blade	medial	1
C39A/7-1b	constr. fill/refuse	final series	blade	distal	1
C39B/2-4a	constr. fill/refuse	final series	blade	medial	1
C39B/2-4b	constr. fill/refuse	flake	-	complete	2
C39B/3-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C39B/4-1a	constr. fill/refuse	fragment	-	-	1
C39B/6-5	SDC39B-2	object from macroblade	eccentric	-	1
C39B/7-4b	SDC39B-3	blade-core frag (non-rejuv)	notched	lateral	1
C39B/7-4g	SDC39B-3	blade-core frag (non-rejuv)	notched	lateral	1
C39B/7-4h	SDC39B-3	blade-core frag (non-rejuv)	notched	lateral	1
C39B/7-4a	SDC39B-3	macroblade	core shaping	-	1
C39B/7-4d	SDC39B-3	macroblade	core shaping	-	1
C39B/7-4e	SDC39B-3	macroflake	core shaping	-	1
C39B/7-4f	SDC39B-3	object from blade core frag	edge-mod. tool	lateral	1
C39B/7-4i	SDC39B-3	objects from core rejuv	other	proximal	1
C39B/7-4c	SDC39B-3	final series	blade	medial	1
C39B/10-8a	SDC39B-4	final series	blade	distal	1
C39B/13-1a	SDC39B-5	final series	blade	distal	1

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C39C/2-1a	constr. fill/refuse	fragment	edge-mod blade?	-	1
C39C/6-4a	SDC39C-2	final series	blade	proximal	1
C39C/6-5a	SDC39C-2	final series	blade	medial	1
C39D/1-1b	constr. fill/refuse	final series	blade	medial	1
C39D/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C39D/1-1c	constr. fill/refuse	flake	-	-	1
C39D/1-2a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C39D/3-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C39D/3-2c	constr. fill/refuse	distal orientation flake	-	-	1
C39D/3-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C39D/3-2d	constr. fill/refuse	fragment	-	-	3
C39D/5-2a	constr. fill/refuse	fragment	-	-	2
C39E/2-1a	constr. fill/refuse	flake	biface thinning	complete	4
C39E/3-1a	constr. fill/refuse	flake	biface thinning	complete	1
C39E/4-1a	constr. fill/refuse	flake	biface thinning	complete	2
C39E/5-2a	constr. fill/refuse	flake	biface thinning	complete and frags	10
C39E/6-1a	constr. fill/refuse	flake	biface thinning	complete	1
C39E/8-1a	constr. fill/refuse	flake	biface thinning	complete and frags	5
C39E/9-1b	constr. fill/refuse	final series	blade	proximal	1
C39E/9-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C39E/13-5a	SD, but not assigned	final series	edge-mod. tool	medial	1
C39E/15-1a	constr. fill/refuse	final series	blade	medial	1
C39E/17-1a	SDC39E-1	final series	edge-mod. tool	medial	1
C39E/22-1a	constr. fill/refuse	final series	blade	distal	1
C39E/30-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C39E/30-2b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C39E/32-8b	constr. fill/refuse	final series	blade	proximal	1
C39E/32-7a	constr. fill/refuse	fragment	-	-	1
C39E/32-8a	constr. fill/refuse	final series	blade	medial	1
C39E/34-21a	SDC39E-4	final series	blade	complete	1
C39E/34-21b	SDC39E-4	final series	blade	distal	2
C39E/36-9a	SDC39E-3	final series	blade	proximal	1
C39E/36-9b	SDC39E-3	final series	blade	medial	1
C39E/37-2a	constr. fill/refuse	final series	blade	complete	1
C39E/38-6a	SDC39E-5	final series	edge-mod. tool	complete	1
C39E/38-7a	SDC39E-5	final series	edge-mod. tool	proximal	1
C39E/40-13a	SDC39E-6	final series	edge-mod. tool	prox/med	1
C39E/40-13b	SDC39E-6	final series	blade	medial	1
C39E/42-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C39E/46-2a	constr. fill/refuse	final series	blade	medial	1
C40A/3-11a	SDC40A-1	final series	edge-mod. tool	proximal	1
C40A/3-11c	SDC40A-1	final series	blade	medial	1
C40A/3-11b	SDC40A-1	final series	edge-mod. tool	medial	3
C40A/3-3a	SDC40A-1	final series	edge-mod. tool	medial	1
C40A/3-3b	SDC40A-1	final series	edge-mod. tool	distal	1
C40C/1-1	constr. fill/refuse	final series	blade	medial	1
C40C/3-1b	constr. fill/refuse	platform prep flake	-	-	1
C40C/3-1a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C40C/4-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C40C/6-5b	SDC40C-1	final series	blade	proximal	1
C40C/6-5a	SDC40C-1	final series	blade	medial	1
C41A/1-3	constr. fill/refuse	final series	blade	medial	1
C41A/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C41A/5-1	constr. fill/refuse	final series	edge-mod. tool	distal	1

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C41B/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C41D/1-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C41D/1-2b	constr. fill/refuse	final series	blade	medial	1
C41D/1-2c	constr. fill/refuse	fragment	-	-	2
C41D/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C41D/2-1b	constr. fill/refuse	fragment	-	-	3
C42A/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C42B/3-1	constr. fill/refuse	fragment	-	-	1
C45A/1-1	constr. fill/refuse	final series	blade	proximal	2
C45B/3-2a	SDC45B-1	final series	blade	medial	1
C46B/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C47B/1-1c	constr. fill/refuse	final series	edge-mod. tool	medial	4
C47B/1-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C47B/1-1b	constr. fill/refuse	final series	blade	medial	5
C47B/2-1b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C47B/2-1a	constr. fill/refuse	final series	blade	proximal	1
C47B/2-1c	constr. fill/refuse	final series	blade	medial	2
C48A/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C48A/3-1	SDC48A-1	final series	edge-mod. tool	medial	1
C49A/1-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C49A/1-1b	constr. fill/refuse	final series	blade	proximal	1
C49A/2-1	constr. fill/refuse	fragment	-	-	1
C49A/3-1b	constr. fill/refuse	exhausted core	-	medial	1
C49A/3-1a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C49A/6-1	SDC49A-3	final series	blade	distal	1
C49A/8-4	SDC49A-4	initial series	blade	complete	1
C49A/8-5	SDC49A-4	final series	edge-mod. tool	med/dist	1
C49A/9-5a	SDC49A-5	final series	blade	complete	1
C49A/9-5c	SDC49A-5	exhausted core	-	distal/ lateral	1
C49A/9-5b	SDC49A-5	final series	blade	medial	2
C49B/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C49B/1-1a	constr. fill/refuse	final series	blade	medial	6
C49B/1-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C49B/2-1c	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C49B/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C49B/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C49B/2-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C49B/2-2b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C49B/2-2c	constr. fill/refuse	flake	edge mod. Tool	complete	1
C49B/2-2d	constr. fill/refuse	fragment	-	-	3
C49B/2-6c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C49B/2-6a	constr. fill/refuse	final series	blade	medial	2
C49B/2-6b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C49B/7-3	constr. fill/refuse	final series	blade	proximal	2
C49D/1-1	constr. fill/refuse	final series	blade	-	1
C49D/1-2	constr. fill/refuse	initial series	blade	-	1
C49D/2-6	constr. fill/refuse	final series	blade	-	1
C49D/3-3	constr. fill/refuse	fragment	-	-	1
C49D/4-4	constr. fill/refuse	final series	blade	-	1
C49D/5-4	constr. fill/refuse	final series	blade	-	1
C49D/6-2	constr. fill/refuse	initial series	blade	-	1
C49D/7-5	constr. fill/refuse	final series	blade	-	1
C49D/7-5	constr. fill/refuse	final series	blade	-	1
C49D/7-4	constr. fill/refuse	final series	blade	-	1

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C49D/11-1	constr. fill/refuse	final series	blade	-	2
C49D/12-1	constr. fill/refuse	final series	blade	-	1
C49D/13-1	constr. fill/refuse	final series	blade	-	1
C49D/14-2	constr. fill/refuse	final series	blade	-	1
C49D/14-1	constr. fill/refuse	final series	blade	-	1
C49D/15-1	constr. fill/refuse	final series	blade	-	1
C49D/15-2	constr. fill/refuse	final series	blade	-	1
C49D/16-5	SDC49D-1	final series	blade	-	1
C49D/16-4	SDC49D-1	platform prep flake	-	-	1
C49D/16-1	SDC49D-1	objects from exhausted core	eccentric	-	1
C49D/16-9	SDC49D-1	objects from exhausted core	eccentric	-	1
C49D/16-2	SDC49D-1	objects from exhausted core	uniface	-	1
C49D/16-3	SDC49D-1	objects from exhausted core	notched	-	1
C49D/19-7	SDC49D-4	final series	blade	-	2
C49D/19-10	SDC49D-4	final series	blade	-	1
C49D/19-13	SDC49D-4	final series	blade	-	1
C49D/20-2	constr. fill/refuse	final series	blade	-	1
C49D/20-1	constr. fill/refuse	final series	blade	-	1
C49D/21-3	SDC49D-5	final series	blade	-	1
C49D/22-9	SDC49D-9	final series	blade	-	2
C49D/22-8	SDC49D-6	fragment	possible blade	-	1
C49D/24-1	constr. fill/refuse	final series	blade	-	1
C49D/26-1	constr. fill/refuse	final series	blade	-	2
C49D/26-2	constr. fill/refuse	fragment	-	-	1
C49D/27-8	constr. fill/refuse	final series	blade	-	2
C49D/27-1	constr. fill/refuse	final series	blade	-	3
C49D/28-7	SDC49D-9	final series	blade	-	1
C49D/28-15	SDC49D-9	initial series	blade	-	2
C49D/28-16	SDC49D-4	final series	blade	-	1
C49D/28-8	SDC49D-9	final series	blade	-	1
C49D/28-9	SDC49D-9	final series	blade	-	2
C49D/28-10	SDC49D-9	final series	blade	-	1
C50A/3-1	SDC50A-1	shatter	-	-	1
C50B/1-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C50B/1-3b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C50B/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C50B/9-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C50B/10-6	SDC50B-3	final series	blade	proximal	1
C50C/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C51A/4-1	constr. fill/refuse	final series	blade	medial	1
C51B/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C51B/3-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C51B/4-2	SD, but not assigned	exhausted core	-	distal/medial	1
C51C/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C51C/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C51C/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C52B/5-1	constr. fill/refuse	final series	blade	proximal	1
C52B/7-1	SDC52B-2	final series	edge-mod. tool	medial	1
C52C/2-4	constr. fill/refuse	final series	edge-mod. tool	medial	3
C52C/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C52C/3-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C52D/2-1	constr. fill/refuse	final series	blade	proximal	1
C52D/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C53A/3-2	constr. fill/refuse	final series	blade	medial	2

Catalog Number	Context	Description 1	Description 2	Part	n=
C53A/5-1	constr. fill/refuse	final series	blade	medial	1
C53B/3-1	constr. fill/refuse	final series	blade	medial	1
C53B/14-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C53B/16-4a	SDC53B-6	final series	blade	proximal	1
C53B/16-4b	SDC53B-6	final series	edge-mod. tool	prox/med	1
C53B/16-4d	SDC53B-6	final series	edge-mod. tool	complete	1
C53B/16-4c	SDC53B-6	final series	edge-mod. tool	medial	3
C53C/3-1	constr. fill/refuse	final series	blade	distal	2
C54B/8-1c	SD, but not assigned	macroflake	core shaping	-	1
C54B/8-1b	SD, but not assigned	final series	edge-mod. tool	med/dist	1
C54B/8-1a	SD, but not assigned	final series	edge-mod. tool	complete	1
C54C/1-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C54C/1-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C55A/4-1	constr. fill/refuse	final series	blade	medial	1
C52C/2-4b	constr. fill/refuse	shatter	-	-	1
C55N/3-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C56B/3-1	constr. fill/refuse	final series	blade	prox/med	1
C56B/4-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C56B/4-1b	constr. fill/refuse	final series	blade	medial	2
C56C/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C56C/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C56C/10-10	SDC56C-3	final series	edge-mod. tool	medial	2
C56C/11-6b	SD, but not assigned	final series	edge-mod. tool	med/dist	1
C56C/11-6a	SD, but not assigned	final series	edge-mod. tool	prox/med	1
C57A/2-1b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C57A/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C57A/4-2a	constr. fill/refuse	final series	blade	prox/med	1
C57A/4-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C57A/4-2d	constr. fill/refuse	final series	blade	distal	2
C57A/4-2c	constr. fill/refuse	final series	blade	medial	4
C57A/4-2e	constr. fill/refuse	fragment	-	-	1
C57A/5-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C57A/5-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C57A/5-2c	constr. fill/refuse	final series	blade	medial	1
C57A/5-2d	constr. fill/refuse	flake	-	-	1
C57A/6-2a	constr. fill/refuse	macroflake with cortex	core shaping	-	1
C57A/6-2b	constr. fill/refuse	final series	blade	medial	4
C57B/1-2	constr. fill/refuse	final series	blade	medial	1
C57B/4-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C57C/1-1	constr. fill/refuse	final series	edge-mod. tool	distal	1
C57C/2-1	constr. fill/refuse	final series	blade	medial	1
C58A/9-1	constr. fill/refuse	final series	blade	medial	1
C58B/2-1	constr. fill/refuse	final series	blade	medial	1
C58C/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C59A/1-1	constr. fill/refuse	final series	blade	medial	1
C59A/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C59A/11-1	SDC59A-4	final series	edge-mod. tool	proximal	1
C60A/3-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C60A/3-1a	constr. fill/refuse	macroflake	fragments	-	2
C60B/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C60B/8-4	SDC60B-1	final series	edge-mod. tool	medial	1
C60B/9-9	SDC60B-2	final series	blade	medial	1
C60C/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C60C/5-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1

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C62A/1-2a	constr. fill/refuse	final series	blade	medial	1
C62A/1-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C62A/2-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C62B/1-1	constr. fill/refuse	final series	blade	medial	1
C63A/2-1	SDC63A-2	final series	edge-mod. tool	prox/med	1
C63B/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C63C/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C63C/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C63C/3-1	constr. fill/refuse	final series	blade	medial	1
C64B/3-2a	SDC64B-1	final series	edge-mod. tool	proximal	1
C64B/3-2b	SDC64B-1	final series	blade	medial	2
C64B/4-1b	SDC64B-1	final series	blade	proximal	1
C64B/4-1a	SDC64B-1	final series	blade	med/dist	1
C65A/2-1	constr. fill/refuse	final series	blade	medial	3
C65A/3-1a	SDC65A-1	final series	edge-mod. tool	prox/med	1
C65A/3-1b	SDC65A-1	final series	edge-mod. tool	medial	1
C65A/6-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C65A/7-1	constr. fill/refuse	final series	hafted tool	medial	1
C65B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C65B/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C65B/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C66B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C67A/8-3	SDC67A-2	final series	blade	prox/med	1
C67A/9-2	SDC67A-3	final series	edge-mod. tool	medial	1
C67A/9-10	SDC67A-3	final series	blade	medial	1
C68A/1-1	constr. fill/refuse	final series	blade	medial	1
C68A/2-1a	SDC68A-1	final series	edge-mod. tool	prox/med	1
C68A/2-1c	SDC68A-1	final series	blade	medial	2
C68A/2-1b	SDC68A-1	final series	edge-mod. tool	medial	4
C68B/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C68B/2-1b	constr. fill/refuse	final series	blade	distal	1
C70B/3-2	constr. fill/refuse	final series	edge-mod. tool	distal	1
C70B/3-5	constr. fill/refuse	initial series	blade	proximal	1
C70B/5-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C70B/12-2	constr. fill/refuse	final series	blade	medial	1
C70B/17-2	constr. fill/refuse	final series	blade	medial	1
C70B/21-3	constr. fill/refuse	final series	blade	distal	1
C70B/26-2	constr. fill/refuse	final series	blade	medial	2
C70B/30-1a	constr. fill/refuse	final series	blade	proximal	1
C70B/30-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C70B/32-4a	SD, but not assigned	exhausted core	-	proximal	1
C70B/32-4b	SD, but not assigned	exhausted core	-	medial/lateral	1
C70B/32-4c	SD, but not assigned	exhausted core	-	distal	1
C70B/32-5	SD, but not assigned	object from blade core frag	edge-mod. tool	medial	1
C70B/32-3c	SD, but not assigned	lateral core frag?	-	-	1
C70B/32-3b	SD, but not assigned	final series	edge-mod. tool	distal	2
C70B/32-3a	SD, but not assigned	final series	edge-mod. tool	medial	6
C70B/34-2	constr. fill/refuse	final series	blade	distal	1
C70B/35-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C70B/38-1	constr. fill/refuse	final series	blade	medial	1
C70B/38-2	constr. fill/refuse	final series	blade	proximal	1
C70B/39-1	constr. fill/refuse	final series	blade	distal	1
C70B/42-1b	SDC70B-2	blade-core frag (non-rejuv)	other	prox/med/distal	1
C70B/42-1n	SDC70B-2	blade-core frag (non-rejuv)	other	proximal/ lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C70B/42-1s	SDC70B-2	blade-core frag (non-rejuv)	other	medial	1
C70B/42-1j	SDC70B-2	blade-core frag (non-rejuv)	other	prox/med/distal	1
C70B/42-1p	SDC70B-2	blade-core frag (non-rejuv)	other	proximal	1
C70B/42-1t	SDC70B-2	blade-core frag (non-rejuv)	other	distal	1
C70B/42-1d	SDC70B-2	blade-core frag (non-rejuv)	other	prox/med/distal	1
C70B/42-1v	SDC70B-2	blade-core frag (non-rejuv)	other	distal	1
C70B/42-1r	SDC70B-2	blade-core frag (non-rejuv)	other	proximal/ lateral	1
C70B/42-1q	SDC70B-2	blade-core frag (non-rejuv)	other	proximal/ lateral	1
C70B/42-1o	SDC70B-2	blade-core frag (non-rejuv)	other	proximal/ lateral	1
C70B/42-1m	SDC70B-2	blade-core frag (non-rejuv)	other	proximal	1
C70B/42-1a	SDC70B-2	blade-core frag (non-rejuv)	other	distal/medial	1
C70B/42-1c	SDC70B-2	blade-core frag (non-rejuv)	other	distal/medial	1
C70B/42-1u	SDC70B-2	blade-core frag (non-rejuv)	flake	proximal	1
C70B/42-1k	SDC70B-2	objects from core rejuv	other	proximal	1
C70B/42-1l	SDC70B-2	objects from exhausted core	notched	prox/med/distal	1
C70B/42-1i	SDC70B-2	objects from exhausted core	notched	prox/med/distal	1
C70B/42-1h	SDC70B-2	objects from exhausted core	notched	prox/med/distal	1
C70B/42-1g	SDC70B-2	objects from exhausted core	notched	distal/medial	1
C70B/42-1e	SDC70B-2	objects from exhausted core	notched	distal/medial	1
C70B/42-1f	SDC70B-2	objects from exhausted core	notched	medial	1
C70B/45-1	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C70B/48-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C70B/59-1	constr. fill/refuse	final series	blade	medial	1
C70D/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C70D/4-5	constr. fill/refuse	final series	blade	medial	1
C70E/1-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C70E/2-5	constr. fill/refuse	final series	edge-mod. tool	distal	1
C71E/2-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C71E/9-1a	constr. fill/refuse	initial series	blade	proximal	1
C71E/12-2a	constr. fill/refuse	platform prep flake	-	-	1
C71E/16-10	SDC71E-2	objects from core rejuv	other	proximal	1
C71E/16-11	SDC71E-2	objects from exhausted core	notched	complete	1
C71E/16-12	SDC71E-2	macroblade	core shaping	-	1
C71E/16-3	SDC71E-2	objects from core rejuv	other	proximal	1
C71E/16-4	SDC71E-2	blade-core frag (non-rejuv)	other	proximal/ lateral	1
C71E/16-5	SDC71E-2	blade-core frag (non-rejuv)	notched	lateral	1
C71E/16-6	SDC71E-2	blade-core frag (non-rejuv)	notched	distal/ lateral	1
C71E/16-7	SDC71E-2	blade-core frag (non-rejuv)	notched	lateral	1
C71E/16-8	SDC71E-2	blade-core frag (non-rejuv)	notched	complete	1
C71E/16-9	SDC71E-2	objects from exhausted core	notched	complete	1
C71E/16-2a	SDC71E-2	final series	blade	complete	2
C71E/17-1a	SD, but not assigned	final series	blade	complete	2
C71E/17-1	SD, but not assigned	final series	lancet	complete	2
C71E/18-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C71E/19-8a	SDC71E-3	exhausted core	-	medial/lateral	1
C71E/19-8a	SDC71E-3	final series	blade	complete	1
C71E/21-5a	constr. fill/refuse	final series	blade	medial	1
C71E/21-5b	constr. fill/refuse	fragment	-	-	1
C71E/28-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C71E/34-7a	constr. fill/refuse	final series	blade	distal	1
C71E/35-1a	constr. fill/refuse	final series	blade	medial	1
C71E/48-1a	constr. fill/refuse	flake	edge-mod tool	-	1
C71E/52-1b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C71E/52-1a	constr. fill/refuse	initial series	blade	medial	2

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C71F/4-1	constr. fill/refuse	final series	blade	medial	1
C72B/13-1a	SDC72B-1	final series	edge-mod. tool	complete	1
C72B/13-1b	SDC72B-1	final series	blade	medial	1
C72B/13-2a	SDC72B-1	final series	blade	proximal	1
C72C/2-1b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C72C/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C72D/6-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C72G/3-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C72I/17-1a	constr. fill/refuse	final series	blade	medial	1
C72I/20-3a	constr. fill/refuse	final series	blade	medial	1
C73B/4-3a	constr. fill/refuse	fragment	-	-	1
C73B/5-1a	constr. fill/refuse	final series	blade	medial	1
C73B/5-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C73B/6-1a	constr. fill/refuse	fragment	-	-	1
C73B/7-6a	constr. fill/refuse	final series	blade	medial	1
C73B/7-6b	constr. fill/refuse	final series	blade	proximal	1
C73B/7-6c	constr. fill/refuse	flake	blade-core frag?	-	1
C73B/8-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C73B/10-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C73B/18-1a	SDC73B-1	objects from exhausted core	eccentric	proximal	1
C73B/21-1b	constr. fill/refuse	final series	blade	distal	1
C73B/21-1a	constr. fill/refuse	final series	blade	medial	1
C73B/23-1a	constr. fill/refuse	final series	blade	medial	2
C73B/23-2a	constr. fill/refuse	flake	macro?	-	1
C73B/24-1a	constr. fill/refuse	final series	blade	distal	1
C73B/27-2a	constr. fill/refuse	initial series	blade	proximal	1
C73B/27-2b	constr. fill/refuse	final series	blade	medial	1
C73B/28-1a	SDC73B-2	fragment	-	-	1
C73B/31-8a	SDC73B-2	final series	edge-mod. tool	medial	1
C74B/2-2b	SDC74B-1	final series	edge-mod. tool	medial	1
C74B/2-2a	SDC74B-1	final series	blade	medial	1
C74B/2-2c	SDC74B-1	fragment	-	-	1
C74B/2-4a	SDC74B-1	final series	blade	distal	1
C74B/3-3a	SDC74B-1	final series	blade	medial	1
C75B/2-4a	constr. fill/refuse	final series	blade	proximal	1
C75B/3-2a	constr. fill/refuse	final series	blade	proximal	1
C75B/3-2c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C75B/3-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C75B/3-8a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C75B/11-1a	SDC75B-2	final series	edge-mod. tool	prox/med	1
C75C/5-1a	constr. fill/refuse	fragment	-	-	1
C75C/5-2b	constr. fill/refuse	final series	blade	distal	1
C75C/5-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C75C/6-5b	constr. fill/refuse	final series	blade	prox/med	2
C75C/6-5d	constr. fill/refuse	final series	blade	medial	2
C75C/6-5c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C75C/6-5a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C75C/6-6a	constr. fill/refuse	blade frag?	edge-mod	-	1
C75C/13-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C75C/13-2d	constr. fill/refuse	final series	blade	medial	1
C75C/13-2b	constr. fill/refuse	initial series	blade	proximal	2
C75C/13-2e	constr. fill/refuse	initial series	blade	distal	2
C75C/13-2c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C75C/15-5a	constr. fill/refuse	final series	edge-mod. tool	medial	3

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C75C/15-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C75C/15-7b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C75E/5-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C75E/11-1a	constr. fill/refuse	macroflake	edge-mod	-	1
C76B/14-10a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76B/15-7a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76B/15-7b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C76B/15-8a	constr. fill/refuse	final series	blade	proximal	1
C76B/15-8b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76C/5-6a	constr. fill/refuse	final series	blade	medial	1
C76C/16-7a	constr. fill/refuse	final series	blade	medial	1
C76C/17-6a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76C/19-3b	constr. fill/refuse	final series	blade	medial	1
C76C/19-3a	constr. fill/refuse	final series	blade	prox/med	1
C76C/23-5a	constr. fill/refuse	final series	hafted tool	complete	1
C76C/23-5b	constr. fill/refuse	final series	blade	medial	1
C76E/23-6a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76E/27-8a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76E/29-5a	constr. fill/refuse	final series	blade	medial	1
C76F/4-11a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76F/15-3a	constr. fill/refuse	final series	blade	prox/med	1
C76F/20-7b	constr. fill/refuse	final series	blade	medial	1
C76F/20-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76F/22-8a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76F/23-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76F/26-5a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76H/1-7a	constr. fill/refuse	final series	blade	proximal	1
C76H/5-27a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C76H/5-27c	constr. fill/refuse	final series	edge-mod. tool	distal	1
C76H/5-27b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C76H/5-27d	constr. fill/refuse	flake	-	-	1
C76H/6-13a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76H/6-13b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C76H/7-14a	constr. fill/refuse	final series	blade	medial	1
C76J/3-26a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76J/7-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76L/2-7a	constr. fill/refuse	final series	blade	medial	1
C76L/3-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76N/4-4a	constr. fill/refuse	final series	blade	medial	1
C76N/5-5a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76N/7-8a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76P/2-4a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76U/1-1a	constr. fill/refuse	macroflake	core shaping	-	1
C76U/3-11a	constr. fill/refuse	exhausted core	-	proximal/medial	1
C76U/3-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76U/3-4a	constr. fill/refuse	final series	blade	medial	1
C76U/3-4b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76U/4-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76U/5-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76U/6-14a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76U/6-14b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C76U/8-22a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C76U/9-22c	constr. fill/refuse	final series	blade	medial	5
C76U/9-22a	constr. fill/refuse	final series	blade	proximal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C76U/9-22e	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C76U/9-22d	constr. fill/refuse	final series	edge-mod. tool	medial	5
C76U/9-22b	constr. fill/refuse	final series	edge-mod. tool	prox/med	6
C76U/9-25a	constr. fill/refuse	flake	-	fragment	1
C76U/9-7b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76U/9-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C76U/11-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76W/4-1a	constr. fill/refuse	final series	blade	proximal	1
C76W/6-1b	constr. fill/refuse	final series	blade	medial	1
C76W/6-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76W/8-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C76W/10-2a	constr. fill/refuse	final series	notched blade	medial	1
C76W/10-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76W/10-3a	constr. fill/refuse	'small' percussion flake	core shaping	-	2
C76W/11-4a	constr. fill/refuse	final series	blade	proximal	1
C76W/11-4b	constr. fill/refuse	final series	blade	distal	1
C76W/12-2a	constr. fill/refuse	initial series	blade	prox/med	1
C76W/15-2a	constr. fill/refuse	macroflake	core shaping	-	1
C76X/4-7a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76X/11-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C76X/12-5b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76X/12-5a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C76X/13-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C76X/13-2b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C76X/14-4a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C77B/2-4a	constr. fill/refuse	fragment	edge-mod?	-	1
C77B/12-49g	constr. fill/refuse	initial series	blade	prox/med	1
C77B/12-48a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C77B/12-49d	constr. fill/refuse	final series	blade	medial	1
C77B/12-49b	constr. fill/refuse	final series	blade	prox/med	2
C77B/12-49f	constr. fill/refuse	final series	blade	distal	2
C77B/12-49c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C77B/12-49e	constr. fill/refuse	final series	edge-mod. tool	distal	3
C77B/12-49a	constr. fill/refuse	final series	edge-mod. tool	prox/med	5
C77B/13-11a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C77C/11-14a	constr. fill/refuse	exhausted core	-	distal	1
C77C/11-13a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C77C/11-13b	constr. fill/refuse	final series	blade	medial	5
C77C/11-13c	constr. fill/refuse	fragment	-	-	1
C77D/3-5a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C78A/2-9a	constr. fill/refuse	initial series	edge-mod. tool	proximal	1
C78A/2-9b	constr. fill/refuse	final series	blade	medial	2
C78C/1-9a	constr. fill/refuse	final series	blade	medial	1
C78C/3-3a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C78D/3-3a	constr. fill/refuse	final series	blade	medial	1
C79B/5-1b	constr. fill/refuse	final series	blade	medial	1
C79B/5-1a	constr. fill/refuse	final series	blade	proximal	1
C79B/17-7a	constr. fill/refuse	fragment	blade-core frag?	-	1
C79B/18-7a	SDC79B-2	final series	edge-mod. tool	medial	5
C79B/20-3a	constr. fill/refuse	fragment	blade-core frag?	-	1
C79B/21-5a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C79B/27-5a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C79B/35-5a	SDC79B-4	final series	edge-mod. tool	medial	6
C79D/3-4a	constr. fill/refuse	final series	notched blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C79D/3-3a	constr. fill/refuse	final series	blade	proximal	1
C79D/11-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C79D/12-1a	constr. fill/refuse	final series	blade	prox/med	1
C8B/102-3a	constr. fill/refuse	final series	blade	proximal	1
C81A/4-3a	constr. fill/refuse	final series	blade	medial	1
C81D/8-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C81H/1-3a	constr. fill/refuse	fragment	-	-	1
C81K/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C81P/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C83A/3-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C83A/5-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C83A/7-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C84B/3-3a	constr. fill/refuse	final series	blade	medial	1
C85C/1-5a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C85C/1-5b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C85C/2-3a	constr. fill/refuse	final series	blade	proximal	1
C85C/2-3b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C85C/4-3a	constr. fill/refuse	core section flake	-	-	1
C85C/4-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C85C/4-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C85C/4-3b	constr. fill/refuse	fragment	-	-	1
C85C/5-12	constr. fill/refuse	final series	edge-mod. tool	medial	2
C85C/5-13	constr. fill/refuse	fragment	-	-	1
C85C/6-17	SDC85C-1	final series	blade	medial	1
C85C/8-2	SDC85C-3	final series	edge-mod. tool	medial	1
C85C/8-7	SDC85C-3	final series	blade	medial	1
C85C/11-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C85C/13-1a	constr. fill/refuse	final series	blade	medial	1
C85C/13-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C85C/15-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C85C/16-4	SDC85C-5	core section flake	edge-mod. tool	-	1
C85C/16-5a	SDC85C-5	initial series	edge-mod. tool	proximal	1
C85C/17-4	SD, but not assigned	core section flake	notched	-	1
C85C/18-1a	SDC85C-5	objects from exhausted core	eccentric	lateral	1
C85C/18-1b	SDC85C-5	objects from exhausted core	eccentric	distal/medial	1
C85C/21-12	SDC85C-4	final series	edge-mod. tool	medial	1
C85C/21-8a	SDC85C-4	final series	edge-mod. tool	medial	3
C85C/21-7	SDC85C-4	final series	edge-mod. tool	prox/med	1
C85C/23-1	SDC85C-7	final series	edge-mod. tool	medial	1
C86A/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86A/1-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C86A/3-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C86A/3-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C86B/1-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C86B/1-4b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C86B/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C86B/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86B/3-1a	constr. fill/refuse	final series	blade	proximal	1
C86B/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86C/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86C/7-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C86C/7-2a	constr. fill/refuse	final series	blade	proximal	1
C86C/7-2b	constr. fill/refuse	fragment	-	-	1
C86C/8-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C86C/12-1	SDC86C-3	object from macroblade	notched	-	1
C86C/12-3	SDC86C-3	platform prep flake	edge-mod. tool	-	1
C86C/12-4c	SDC86C-3	core section flake	edge-mod. tool	-	1
C86C/12-4a	SDC86C-3	macroflake	notched	-	1
C86C/12-4b	SDC86C-3	platform prep flake	notched	-	1
C86C/12-2b	SDC86C-3	final series	edge-mod. tool	medial	1
C86C/12-2a	SDC86C-3	final series	blade	med/dist	1
C86C/14-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C86C/15-2b	SDC86C-5	blade-core frag (non-rejuv)	-	proximal/medial	1
C86C/15-2a	SDC86C-5	exhausted core	-	complete	1
C86C/15-3e	SDC86C-5	distal orientation flake	notched	-	1
C86C/15-3c	SDC86C-5	macroblade	notched	-	1
C86C/15-3a	SDC86C-5	macroflake	notched	-	1
C86C/15-3b	SDC86C-5	macroflake	notched	-	1
C86C/15-3d	SDC86C-5	platform prep flake	-	-	1
C86C/15-4	SDC86C-5	final series	blade	medial	1
C86C/15-7a	SDC86C-5	macroflake	-	-	1
C86C/15-5	SDC86C-5	final series	edge-mod. tool	complete	1
C86C/15-6	SDC86C-5	final series	blade	prox/med	1
C86C/15-7b	SDC86C-5	flake fragments	-	-	5
C86C/17-1	constr. fill/refuse	final series	blade	med/dist	1
C86C/18-1	constr. fill/refuse	initial series	edge-mod. tool	proximal	1
C86C/22-2	constr. fill/refuse	final series	blade	distal	2
C86D/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86D/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C86D/2-2	constr. fill/refuse	final series	blade	proximal	1
C86D/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86D/5-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C86D/5-2a	constr. fill/refuse	final series	blade	proximal	1
C86D/5-2d	constr. fill/refuse	final series	blade	distal	1
C86D/5-2c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C86D/7-1	constr. fill/refuse	final series	edge-mod. tool	distal	1
C86D/7-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86D/8-1	constr. fill/refuse	final series	blade	distal	1
C86F/2-2	constr. fill/refuse	fragment	-	-	1
C86L/1-1	constr. fill/refuse	final series	blade	proximal	1
C86L/1-2	constr. fill/refuse	fragment	-	-	2
C86L/3-2b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C86L/3-2a	constr. fill/refuse	final series	edge-mod. tool	medial	4
C86L/3-3	constr. fill/refuse	fragment	-	-	2
C86M/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C86M/2-1a	constr. fill/refuse	final series	blade	prox/med	1
C86M/3-1	constr. fill/refuse	final series	blade	medial	1
C87B/1-9a	SDC87B-1	'small' percussion blade	overhang removal	-	1
C87B/3-1a	SDC87B-1	final series	edge-mod. tool	medial	1
C87B/3-1b	SDC87B-1	final series	blade	medial	1
C87B/9-1a	SDC87B-1	initial series	blade	proximal	1
C87B/9-2	SDC87B-1	various debitage	-	fragment	1
C87E/1-1a	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87E/1-2b	SDC87E-1	distal orientation flake	-	-	3
C87E/1-2a	SDC87E-1	objects from exhausted core	notched	proximal/ lateral	1
C87E/1-2c	SDC87E-1	initial series	blade	proximal	1
C87E/1-3a	SDC87E-1	distal orientation flake	-	-	1
C87E/1-3c	SDC87E-1	final series	blade	prox/med	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C87E/1-3b	SDC87E-1	initial series	blade	prox/med	1
C87E/1-4b	SDC87E-1	platform prep flake	-	-	1
C87E/1-4a	SDC87E-1	initial series	blade	proximal	2
C87E/2-1d	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87E/2-1a	SDC87E-1	distal orientation flake	-	-	1
C87E/2-1c	SDC87E-1	macroblade	core shaping	-	1
C87E/2-1b	SDC87E-1	various debitage	-	fragment	1
C87E/2-2a	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	1
C87E/2-2b	SDC87E-1	core section flake	-	-	1
C87E/2-2c	SDC87E-1	distal orientation flake	-	-	1
C87E/2-3d	SDC87E-1	initial series	point	complete	1
C87E/2-3c	SDC87E-1	final series	blade	medial	3
C87E/2-3a	SDC87E-1	initial series	blade	complete and fragments	3
C87E/2-3b	SDC87E-1	final series	blade	prox/med	5
C87E/2-4a	SDC87E-1	initial series	blade	proximal	1
C87E/2-4b	SDC87E-1	initial series	blade	medial	1
C87E/2-5a	SDC87E-1	final series	edge-mod. tool	medial	1
C87E/2-5c	SDC87E-1	final series	blade	proximal	1
C87E/2-5b	SDC87E-1	final series	blade	medial	1
C87E/2-6c	SDC87E-1	distal orientation flake	-	-	3
C87E/2-6b	SDC87E-1	macroblade	overhang removal	-	2
C87E/2-6a	SDC87E-1	platform prep flake	-	-	3
C87E/2-6e	SDC87E-1	final series	blade	distal	2
C87E/2-6d	SDC87E-1	initial series	blade	complete and fragments	5
C87E/2-7a	SDC87E-1	distal orientation flake	-	-	1
C87E/2-7b	SDC87E-1	initial series	edge-mod. tool	medial	1
C87E/2-8a	SDC87E-1	platform prep flake	notched	-	1
C87E/3-1d	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/3-1e	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	2
C87E/3-1a	SDC87E-1	core section flake	-	-	2
C87E/3-1b	SDC87E-1	distal orientation flake	-	-	3
C87E/3-1f	SDC87E-1	objects from exhausted core	edge-mod. tool	medial	1
C87E/3-1g	SDC87E-1	objects from exhausted core	edge-mod. tool	medial	1
C87E/3-1c	SDC87E-1	striated core-top fragment	-	-	1
C87E/3-1h	SDC87E-1	final series	blade	plunging distal	1
C87E/3-10a	SDC87E-1	macroblade	core shaping	-	1
C87E/3-13a	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87E/3-14b	SDC87E-1	faceted/striated core-top fragment	-	-	1
C87E/3-14a	SDC87E-1	platform prep flake	-	-	1
C87E/3-15b	SDC87E-1	final series	blade	proximal	1
C87E/3-15a	SDC87E-1	initial series	blade	complete and fragments	2
C87E/3-16a	SDC87E-1	initial series	blade	medial	1
C87E/3-17e	SDC87E-1	platform prep flake	-	-	1
C87E/3-17d	SDC87E-1	final series	blade	distal	1
C87E/3-17c	SDC87E-1	final series	blade	medial	2
C87E/3-17a	SDC87E-1	initial series	blade	proximal	3
C87E/3-17b	SDC87E-1	final series	blade	proximal	3
C87E/3-18b	SDC87E-1	final series	blade	medial	1
C87E/3-18a	SDC87E-1	final series	blade	proximal	2
C87E/3-19d	SDC87E-1	distal orientation flake	-	-	1
C87E/3-19c	SDC87E-1	platform prep flake	-	-	1
C87E/3-19b	SDC87E-1	final series	blade	distal	1
C87E/3-19a	SDC87E-1	final series	blade	proximal	3

Catalog Number	Context	Description 1	Description 2	Part	n=
C87E/3-19e	SDC87E-1	various debitage	-	fragment	5
C87E/3-2a	SDC87E-1	core section flake	-	-	1
C87E/3-2b	SDC87E-1	distal orientation flake	-	-	1
C87E/3-3a	SDC87E-1	distal orientation flake	-	-	1
C87E/3-3b	SDC87E-1	final series	blade	plunging distal	1
C87E/3-4m	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/3-4n	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87E/3-4o	SDC87E-1	blade-core frag (non-rejuv)	core section	lateral	1
C87E/3-4i	SDC87E-1	core section flake	-	-	1
C87E/3-4j	SDC87E-1	distal orientation flake	-	-	11
C87E/3-4l	SDC87E-1	faceted/striated core-top fragment	-	-	2
C87E/3-4k	SDC87E-1	lateral core rejuv	-	-	3
C87E/3-4a	SDC87E-1	macroflake with cortex	core shaping	-	3
C87E/3-4h	SDC87E-1	platform prep flake	-	-	21
C87E/3-4g	SDC87E-1	'small' percussion blade	overhang removal	-	2
C87E/3-4c	SDC87E-1	final series	blade	proximal	1
C87E/3-4f	SDC87E-1	final series	blade	plunging distal	2
C87E/3-4d	SDC87E-1	final series	blade	medial	2
C87E/3-4e	SDC87E-1	final series	blade	distal	3
C87E/3-4b	SDC87E-1	initial series	blade	complete and fragments	75
C87E/3-4p	SDC87E-1	various debitage	-	fragment	99
C87E/3-5g	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87E/3-5d	SDC87E-1	distal orientation flake	-	-	10
C87E/3-5f	SDC87E-1	faceted core-top fragment	-	-	1
C87E/3-5e	SDC87E-1	lateral core rejuv	-	-	1
C87E/3-5c	SDC87E-1	platform prep flake	-	-	4
C87E/3-5a	SDC87E-1	'small' percussion blade	core shaping	-	2
C87E/3-5h	SDC87E-1	final series	blade	plunging distal	1
C87E/3-5b	SDC87E-1	initial series	blade	complete and fragments	4
C87E/3-5i	SDC87E-1	various debitage	-	fragment	3
C87E/3-6b	SDC87E-1	blade-core frag (non-rejuv)	core section	indeterminate	4
C87E/3-6a	SDC87E-1	faceted core-top fragment	-	-	1
C87E/3-7g	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87E/3-7f	SDC87E-1	distal orientation flake	-	-	1
C87E/3-7e	SDC87E-1	final series	blade	distal	1
C87E/3-7b	SDC87E-1	final series	blade	complete	2
C87E/3-7a	SDC87E-1	initial series	blade	proximal	2
C87E/3-7d	SDC87E-1	final series	blade	medial	3
C87E/3-7c	SDC87E-1	final series	blade	proximal	7
C87E/3-7h	SDC87E-1	various debitage	-	fragment	1
C87E/3-8b	SDC87E-1	final series	blade	complete	2
C87E/3-8e	SDC87E-1	final series	blade	distal	3
C87E/3-8d	SDC87E-1	final series	blade	medial	6
C87E/3-8a	SDC87E-1	initial series	blade	complete and fragments	20
C87E/3-8c	SDC87E-1	final series	blade	proximal	46
C87E/3-9a	SDC87E-1	final series	blade	proximal	14
C87E/3-9b	SDC87E-1	final series	blade	medial	21
C87E/3-9c	SDC87E-1	final series	blade	distal	22
C87E/3-9d	SDC87E-1	various debitage	-	fragment	1
C87E/4-1a	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	2
C87E/4-1b	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	3
C87E/4-1c	SDC87E-1	blade-core frag (non-rejuv)	core section	lateral	1
C87E/4-1d	SDC87E-1	objects from exhausted core	notched	distal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C87E/4-12a	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87E/4-13a	SDC87E-1	blade-core frag (non-rejuv)	core section	indeterminate	1
C87E/4-2a	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/4-3e	SDC87E-1	indeterminate rejuv debitage	fragment	-	1
C87E/4-3d	SDC87E-1	final series	blade	distal	3
C87E/4-3c	SDC87E-1	final series	blade	medial	3
C87E/4-3a	SDC87E-1	initial series	blade	proximal	4
C87E/4-3b	SDC87E-1	final series	blade	proximal	18
C87E/4-4b	SDC87E-1	final series	blade	medial	1
C87E/4-4a	SDC87E-1	final series	blade	proximal	2
C87E/4-4c	SDC87E-1	final series	blade	distal	2
C87E/4-5k	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	3
C87E/4-5g	SDC87E-1	distal orientation flake	-	-	6
C87E/4-5i	SDC87E-1	faceted/striated core-top fragment	-	-	3
C87E/4-5h	SDC87E-1	lateral core rejuv	-	-	1
C87E/4-5a	SDC87E-1	macroflake	core shaping	-	3
C87E/4-5f	SDC87E-1	platform prep flake	-	-	3
C87E/4-5l	SDC87E-1	'small' percussion flake	overhang removal	-	1
C87E/4-5j	SDC87E-1	striated core-top fragment	-	-	2
C87E/4-5d	SDC87E-1	final series	blade	medial	1
C87E/4-5e	SDC87E-1	final series	blade	distal	6
C87E/4-5b	SDC87E-1	initial series	blade	complete and fragments	8
C87E/4-5c	SDC87E-1	final series	blade	proximal	12
C87E/4-5m	SDC87E-1	various debitage	-	fragment	24
C87E/4-6a	SDC87E-1	core section flake	-	-	1
C87E/4-7a	SDC87E-1	various debitage	-	fragment	2
C87E/4-8b	SDC87E-1	core section flake	-	-	1
C87E/4-8c	SDC87E-1	distal orientation flake	-	-	4
C87E/4-8d	SDC87E-1	initial series	blade	complete	1
C87E/4-8a	SDC87E-1	initial series	blade	proximal	1
C87E/4-9e	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87E/4-9d	SDC87E-1	platform prep flake	-	-	1
C87E/4-9c	SDC87E-1	final series	blade	distal	6
C87E/4-9a	SDC87E-1	final series	blade	proximal	7
C87E/4-9b	SDC87E-1	final series	blade	medial	11
C87E/4-9f	SDC87E-1	various debitage	-	fragment	1
C87E/5-1	SDC87E-1	final series	blade	distal	1
C87E/5-2a	SDC87E-1	various debitage	-	fragment	1
C87E/6-1b	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	2
C87E/6-1c	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	2
C87E/6-1a	SDC87E-1	distal orientation flake	-	-	2
C87E/6-2a	SDC87E-1	various debitage	-	fragment	1
C87E/6-7a	SDC87E-1	various debitage	-	fragment	2
C87E/7-1d	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/7-1e	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	2
C87E/7-1f	SDC87E-1	blade-core frag (non-rejuv)	core section	lateral	3
C87E/7-1g	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	1
C87E/7-1h	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	5
C87E/7-1c	SDC87E-1	core section flake	-	-	5
C87E/7-1a	SDC87E-1	distal orientation flake	-	-	6
C87E/7-1b	SDC87E-1	final series	blade	plunging distal	1
C87E/7-11a	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/7-11b	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C87E/7-12d	SDC87E-1	bidirectional core frag	core section	lateral	1
C87E/7-12a	SDC87E-1	blade-core frag (non-rejuv)	core section	complete	1
C87E/7-12c	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	1
C87E/7-12b	SDC87E-1	striated core-top fragment	-	-	1
C87E/7-13b	SDC87E-1	final series	blade	complete	1
C87E/7-13a	SDC87E-1	initial series	blade	proximal	1
C87E/7-13d	SDC87E-1	final series	blade	distal	1
C87E/7-13c	SDC87E-1	final series	blade	proximal	6
C87E/7-14d	SDC87E-1	final series	blade	medial	6
C87E/7-14a	SDC87E-1	initial series	blade	complete and fragments	8
C87E/7-14b	SDC87E-1	final series	blade	complete	11
C87E/7-14e	SDC87E-1	final series	blade	distal	13
C87E/7-14c	SDC87E-1	final series	blade	proximal	22
C87E/7-15a	SDC87E-1	final series	blade	proximal	8
C87E/7-15c	SDC87E-1	final series	blade	distal	11
C87E/7-15b	SDC87E-1	final series	blade	medial	11
C87E/7-16a	SDC87E-1	core section flake	-	-	1
C87E/7-17a	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87E/7-17c	SDC87E-1	platform prep flake	-	-	1
C87E/7-17b	SDC87E-1	final series	blade	plunging distal	1
C87E/7-18a	SDC87E-1	final series	blade	plunging distal	1
C87E/7-18b	SDC87E-1	various debitage	-	fragment	2
C87E/7-19e	SDC87E-1	blade-core frag (non-rejuv)	core section	lateral	1
C87E/7-19c	SDC87E-1	core section flake	-	-	1
C87E/7-19d	SDC87E-1	distal orientation flake	-	-	4
C87E/7-19b	SDC87E-1	platform prep flake	-	-	3
C87E/7-19a	SDC87E-1	initial series	blade	complete and fragments	6
C87E/7-19g	SDC87E-1	various debitage	-	fragment	1
C87E/7-19f	SDC87E-1	'small' percussion blade	overhange removal	-	2
C87E/7-2a	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	2
C87E/7-20j	SDC87E-1	blade-core frag (non-rejuv)	core section	lateral	2
C87E/7-20h	SDC87E-1	distal orientation flake	-	-	5
C87E/7-20a	SDC87E-1	macroflake with cortex	core shaping	-	1
C87E/7-20g	SDC87E-1	platform prep flake	-	-	10
C87E/7-20f	SDC87E-1	final series	blade	distal	1
C87E/7-20e	SDC87E-1	final series	blade	medial	1
C87E/7-20d	SDC87E-1	final series	blade	proximal	3
C87E/7-20c	SDC87E-1	initial series	blade	complete and fragments	41
C87E/7-20l	SDC87E-1	various debitage	-	fragment	56
C87E/7-20b	SDC87E-1	'small' percussion blade	core shaping	-	4
C87E/7-20k	SDC87E-1	'small' percussion blade	overhang removal	-	1
C87E/7-20i	SDC87E-1	striated core-top fragment	-	-	1
C87E/7-21a	SDC87E-1	initial series	blade	proximal	1
C87E/7-22b	SDC87E-1	final series	blade	distal	2
C87E/7-22c	SDC87E-1	final series	blade	complete	2
C87E/7-22a	SDC87E-1	initial series	blade	proximal	4
C87E/7-23a	SDC87E-1	final series	blade	proximal	1
C87E/7-24c	SDC87E-1	final series	blade	medial	1
C87E/7-24d	SDC87E-1	final series	blade	distal	1
C87E/7-24a	SDC87E-1	initial series	blade	proximal	2
C87E/7-24b	SDC87E-1	final series	blade	proximal	5
C87E/7-25a	SDC87E-1	final series	edge-mod. tool	proximal	1
C87E/7-26a	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	2
C87E/7-27b	SDC87E-1	various debitage	-	fragment	2

Catalog Number	Context	Description 1	Description 2	Part	n=
C87E/7-27a	SDC87E-1	platform prep flake	-	-	4
C87E/7-3g	SDC87E-1	core section flake	-	-	1
C87E/7-3h	SDC87E-1	distal orientation flake	-	-	3
C87E/7-3i	SDC87E-1	indeterminate rejuv debitage	-	-	1
C87E/7-3a	SDC87E-1	macroblade	core shaping	-	1
C87E/7-3f	SDC87E-1	platform prep flake	-	-	4
C87E/7-3c	SDC87E-1	final series	blade	proximal	1
C87E/7-3d	SDC87E-1	final series	blade	medial	1
C87E/7-3e	SDC87E-1	final series	blade	distal	2
C87E/7-3j	SDC87E-1	various debitage	-	fragment	1
C87E/7-3a	SDC87E-1	initial series	blade	proximal	3
C87E/7-4k	SDC87E-1	blade-core frag (non-rejuv)	core section	indeterminate	5
C87E/7-4n	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/7-4i	SDC87E-1	core section flake	-	-	3
C87E/7-4m	SDC87E-1	cortical core-top fragment	-	-	1
C87E/7-4j	SDC87E-1	distal orientation flake	-	-	17
C87E/7-4a	SDC87E-1	macroflake with cortex	core shaping	-	4
C87E/7-4o	SDC87E-1	objects from core rejuv	core section	complete	1
C87E/7-4p	SDC87E-1	objects from core rejuv	distal orientation	complete	1
C87E/7-4h	SDC87E-1	platform prep flake	-	-	23
C87E/7-4d	SDC87E-1	final series	blade	complete	1
C87E/7-4q	SDC87E-1	final series	blade	plunging distal	1
C87E/7-4g	SDC87E-1	final series	blade	distal	7
C87E/7-4f	SDC87E-1	final series	blade	medial	7
C87E/7-4e	SDC87E-1	final series	blade	proximal	33
C87E/7-4c	SDC87E-1	initial series	blade	complete and fragments	52
C87E/7-4s	SDC87E-1	various debitage	-	fragment	164
C87E/7-4b	SDC87E-1	'small' percussion flake	core shaping	-	13
C87E/7-4r	SDC87E-1	'small' percussion flake	overhang removal	-	7
C87E/7-4l	SDC87E-1	striated core-top fragment	-	-	2
C87E/7-5a	SDC87E-1	various debitage	-	shatter	11
C87E/7-6a	SDC87E-1	macroblade	medial/distal	-	1
C87E/7-7g	SDC87E-1	macroblade	overhange removal	-	1
C87E/7-7d	SDC87E-1	final series	blade	medial	1
C87E/7-7f	SDC87E-1	final series	edge-mod. tool	medial	2
C87E/7-7e	SDC87E-1	final series	blade	distal	2
C87E/7-7b	SDC87E-1	final series	blade	complete	2
C87E/7-7a	SDC87E-1	initial series	blade	complete and fragments	4
C87E/7-7c	SDC87E-1	final series	blade	proximal	9
C87E/7-8m	SDC87E-1	macroblade	overhange removal	-	3
C87E/7-8a	SDC87E-1	macroflake with cortex	core shaping	-	2
C87E/7-8h	SDC87E-1	final series	edge-mod. tool	proximal	1
C87E/7-8k	SDC87E-1	final series	edge-mod. tool	medial	1
C87E/7-8i	SDC87E-1	final series	edge-mod. tool	proximal	1
C87E/7-8g	SDC87E-1	final series	edge-mod. tool	proximal	1
C87E/7-8j	SDC87E-1	final series	edge-mod. tool	medial	1
C87E/7-8l	SDC87E-1	final series	blade	plunging distal	2
C87E/7-8c	SDC87E-1	final series	blade	complete	8
C87E/7-8b	SDC87E-1	initial series	blade	complete and fragments	12
C87E/7-8e	SDC87E-1	final series	blade	medial	27
C87E/7-8f	SDC87E-1	final series	blade	distal	28
C87E/7-8d	SDC87E-1	final series	blade	proximal	38
C87E/7-8n	SDC87E-1	various debitage	-	fragment	2
C87E/8-1a	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C87E/9-3a	SDC87E-1	final series	blade	proximal	1
C87E/9-4a	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/9-5a	SDC87E-1	final series	blade	proximal	1
C87E/9-6a	SDC87E-1	final series	blade	proximal	1
C87E/9-6c	SDC87E-1	indeterminate rejuv debitage	-	-	1
C87E/9-6b	SDC87E-1	platform prep flake	-	-	1
C87E/9-7a	SDC87E-1	final series	blade	distal	1
C87E/11-1b	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	2
C87E/11-1c	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	2
C87E/11-1d	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	1
C87E/11-1a	SDC87E-1	core section flake	-	-	1
C87E/11-1e	SDC87E-1	objects from exhausted core	edge-mod. tool	medial/lateral	1
C87E/11-10a	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/11-11a	SDC87E-1	initial series	blade	distal	1
C87E/11-12a	SDC87E-1	various debitage	-	fragment	2
C87E/11-13c	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/11-13d	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/11-13b	SDC87E-1	core section flake	-	-	1
C87E/11-13a	SDC87E-1	platform prep flake	-	-	2
C87E/11-14a	SDC87E-1	initial series	blade	complete and fragments	4
C87E/11-14d	SDC87E-1	various debitage	-	fragment	5
C87E/11-14b	SDC87E-1	distal orientation flake	-	-	1
C87E/11-14c	SDC87E-1	lateral core rejuv	-	-	1
C87E/11-15a	SDC87E-1	initial series	blade	proximal	2
C87E/11-16a	SDC87E-1	initial series	blade	complete and fragments	2
C87E/11-16e	SDC87E-1	final series	blade	distal	2
C87E/11-16b	SDC87E-1	final series	blade	complete	4
C87E/11-16c	SDC87E-1	final series	blade	proximal	7
C87E/11-16d	SDC87E-1	final series	blade	medial	7
C87E/11-17b	SDC87E-1	final series	blade	proximal	1
C87E/11-17a	SDC87E-1	initial series	blade	proximal	1
C87E/11-18a	SDC87E-1	initial series	blade	complete and fragments	2
C87E/11-2b	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	1
C87E/11-2c	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/11-2d	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87E/11-2a	SDC87E-1	distal orientation flake	-	-	1
C87E/11-3c	SDC87E-1	final series	blade	medial	2
C87E/11-3a	SDC87E-1	final series	blade	complete	5
C87E/11-3b	SDC87E-1	final series	blade	proximal	8
C87E/11-4b	SDC87E-1	final series	blade	complete	8
C87E/11-4e	SDC87E-1	final series	blade	distal	9
C87E/11-4d	SDC87E-1	final series	blade	medial	9
C87E/11-4a	SDC87E-1	initial series	blade	complete and fragments	15
C87E/11-4c	SDC87E-1	final series	blade	proximal	19
C87E/11-5c	SDC87E-1	initial series	blade	complete and fragments	5
C87E/11-5g	SDC87E-1	various debitage	-	fragment	1
C87E/11-5f	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/11-5d	SDC87E-1	distal orientation flake	-	-	1
C87E/11-5e	SDC87E-1	indeterminate rejuv debitage	-	-	1
C87E/11-5a	SDC87E-1	macroflake	core shaping	-	1
C87E/11-5b	SDC87E-1	'small' percussion blade	core shaping	-	1
C87E/11-6c	SDC87E-1	final series	blade	distal	3
C87E/11-6b	SDC87E-1	initial series	blade	complete and fragments	22
C87E/11-6h	SDC87E-1	various debitage	-	fragment	34

Catalog Number	Context	Description 1	Description 2	Part	n=
C87E/11-6g	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/11-6e	SDC87E-1	distal orientation flake	-	-	2
C87E/11-6d	SDC87E-1	platform prep flake	-	-	21
C87E/11-6a	SDC87E-1	'small' percussion blade	core shaping	-	1
C87E/11-6f	SDC87E-1	striated core-top fragment	-	-	1
C87E/11-7c	SDC87E-1	various debitage	-	fragment	3
C87E/11-7b	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87E/11-7a	SDC87E-1	striated core-top fragment	-	-	1
C87E/11-8a	SDC87E-1	final series	blade	complete	1
C87E/11-8b	SDC87E-1	final series	blade	proximal	1
C87E/11-9b	SDC87E-1	final series	blade	proximal	1
C87E/11-9a	SDC87E-1	initial series	blade	complete and fragments	3
C87E/12-1b	SDC87E-1	core section flake	-	-	3
C87E/12-1a	SDC87E-1	platform prep flake	-	-	3
C87E/12-1c	SDC87E-1	striated core-top fragment	-	-	1
C87E/12-1d	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	2
C87E/12-1e	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	2
C87E/12-1f	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	3
C87E/12-10a	SDC87E-1	initial series	blade	complete	1
C87E/12-2c	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	1
C87E/12-2d	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/12-2a	SDC87E-1	distal orientation flake	-	-	1
C87E/12-2b	SDC87E-1	indeterminate core-top fragment	-	-	1
C87E/12-3a	SDC87E-1	initial series	blade	proximal	5
C87E/12-3e	SDC87E-1	final series	blade	distal	7
C87E/12-3d	SDC87E-1	final series	blade	medial	7
C87E/12-3b	SDC87E-1	final series	blade	complete	17
C87E/12-3c	SDC87E-1	final series	blade	proximal	31
C87E/12-4f	SDC87E-1	final series	blade	plunging distal	1
C87E/12-4g	SDC87E-1	initial series	blade	overhang removal	1
C87E/12-4b	SDC87E-1	final series	blade	complete	2
C87E/12-4d	SDC87E-1	final series	blade	medial	2
C87E/12-4e	SDC87E-1	final series	blade	distal	4
C87E/12-4a	SDC87E-1	initial series	blade	complete and fragments	4
C87E/12-4c	SDC87E-1	final series	blade	proximal	5
C87E/12-40c	SDC87E-1	final series	blade	distal	1
C87E/12-40b	SDC87E-1	final series	blade	proximal	1
C87E/12-40d	SDC87E-1	final series	edge-mod. tool	proximal	1
C87E/12-40e	SDC87E-1	final series	edge-mod. tool	distal	1
C87E/12-40a	SDC87E-1	final series	blade	complete	1
C87E/12-40b	SDC87E-1	final series	blade	distal	1
C87E/12-40a	SDC87E-1	final series	blade	medial	2
C87E/12-5c	SDC87E-1	final series	blade	distal	15
C87E/12-5a	SDC87E-1	final series	blade	proximal	26
C87E/12-5b	SDC87E-1	final series	blade	medial	37
C87E/12-5e	SDC87E-1	various debitage	-	fragment	5
C87E/12-5d	SDC87E-1	platform prep flake	-	-	1
C87E/12-6c	SDC87E-1	final series	blade	distal	1
C87E/12-6b	SDC87E-1	final series	blade	medial	1
C87E/12-6a	SDC87E-1	final series	blade	proximal	3
C87E/12-7c	SDC87E-1	various debitage	-	fragment	1
C87E/12-7a	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	1
C87E/12-7b	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1

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C87E/12-8a	SDC87E-1	initial series	blade	complete and fragments	4
C87E/12-8e	SDC87E-1	various debitage	-	fragment	4
C87E/12-8d	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87E/12-8c	SDC87E-1	lateral core rejuv	-	-	3
C87E/12-8b	SDC87E-1	platform prep flake	-	-	6
C87E/12-9j	SDC87E-1	initial series	blade	overhang removal	5
C87E/12-9c	SDC87E-1	final series	blade	proximal	5
C87E/12-9d	SDC87E-1	final series	blade	distal	6
C87E/12-9b	SDC87E-1	initial series	blade	complete and fragments	31
C87E/12-9i	SDC87E-1	various debitage	-	fragment	63
C87E/12-9h	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87E/12-9f	SDC87E-1	distal orientation flake	-	-	7
C87E/12-9g	SDC87E-1	lateral core rejuv	-	-	3
C87E/12-9a	SDC87E-1	macroblade	core shaping	-	2
C87E/12-9e	SDC87E-1	platform prep flake	-	-	31
C87F/1-3n	SDC87E-1	final series	blade	plunging distal	3
C87F/1-3j	SDC87E-1	bidirectional core	core section	distal	1
C87F/1-3a	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	1
C87F/1-3b	SDC87E-1	blade-core frag (non-rejuv)	core section	lateral	1
C87F/1-3c	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87F/1-3d	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87F/1-3e	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	1
C87F/1-3f	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	1
C87F/1-3h	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	2
C87F/1-3i	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	5
C87F/1-3k	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	18
C87F/1-3l	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	9
C87F/1-3m	SDC87E-1	distal orientation flake	-	-	6
C87F/1-3g	SDC87E-1	striated core-top fragment	-	-	3
C87F/1-4f	SDC87E-1	final series	blade	distal	1
C87F/1-4e	SDC87E-1	final series	blade	medial	2
C87F/1-4d	SDC87E-1	final series	blade	proximal	7
C87F/1-4c	SDC87E-1	initial series	blade	complete and fragments	96
C87F/1-4g	SDC87E-1	various debitage	-	fragment	250
C87F/1-4m	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	4
C87F/1-4n	SDC87E-1	blade-core frag (non-rejuv)	core section	lateral	25
C87F/1-4o	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	2
C87F/1-4p	SDC87E-1	blade-core frag (non-rejuv)	core section	indeterminate	20
C87F/1-4j	SDC87E-1	core section flake	-	-	5
C87F/1-4k	SDC87E-1	distal orientation flake	-	-	17
C87F/1-4q	SDC87E-1	indeterminate core-top fragment	-	-	1
C87F/1-4a	SDC87E-1	macroflake with cortex	core shaping	-	3
C87F/1-4i	SDC87E-1	platform prep flake	-	-	100
C87F/1-4b	SDC87E-1	'small' percussion flake	core shaping	-	2
C87F/1-4h	SDC87E-1	'small' percussion flake	overhang removal	-	8
C87F/1-4l	SDC87E-1	striated core-top fragment	-	-	9
C87F/1-5g	SDC87E-1	final series	blade	plunging distal	3
C87F/1-5i	SDC87E-1	initial series	blade	overhang removal	9
C87F/1-5c	SDC87E-1	final series	blade	complete	40
C87F/1-5f	SDC87E-1	final series	blade	distal	62
C87F/1-5e	SDC87E-1	final series	blade	medial	87
C87F/1-5b	SDC87E-1	initial series	blade	complete and fragments	113
C87F/1-5d	SDC87E-1	final series	blade	proximal	137

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C87F/1-5m	SDC87E-1	various debitage	-	fragment	75
C87F/1-5j	SDC87E-1	distal orientation flake	-	-	2
C87F/1-5h	SDC87E-1	lateral core rejuv	fragment	-	1
C87F/1-5l	SDC87E-1	objects from exhausted core	notched	proximal/ lateral	1
C87F/1-5k	SDC87E-1	platform prep flake	-	-	3
C87F/1-5a	SDC87E-1	'small' percussion flake	core shaping	-	5
C87F/2-3a	SDC87E-1	final series	blade	proximal	2
C87F/2-3b	SDC87E-1	final series	blade	medial	2
C87F/2-4a	SDC87E-1	flake	-	complete	1
C87F/3-4e	SDC87E-1	final series	blade	plunging distal	3
C87F/3-4f	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	4
C87F/3-4g	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	3
C87F/3-4h	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	12
C87F/3-4i	SDC87E-1	blade-core frag (non-rejuv)	core section	indeterminate	3
C87F/3-4j	SDC87E-1	blade-core frag (non-rejuv)	other	lateral	3
C87F/3-4k	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	5
C87F/3-4c	SDC87E-1	core section flake	-	-	1
C87F/3-4a	SDC87E-1	macroflake with cortex	core shaping	-	2
C87F/3-4b	SDC87E-1	platform prep flake	-	-	4
C87F/3-4d	SDC87E-1	platform prep flake	-	-	9
C87F/3-6p	SDC87E-1	final series	blade	plunging distal	1
C87F/3-6d	SDC87E-1	final series	blade	complete	4
C87F/3-6g	SDC87E-1	final series	blade	distal	9
C87F/3-6f	SDC87E-1	final series	blade	medial	16
C87F/3-6e	SDC87E-1	final series	blade	proximal	21
C87F/3-6c	SDC87E-1	initial series	blade	complete and fragments	33
C87F/3-6q	SDC87E-1	various debitage	-	fragment	90
C87F/3-6m	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	4
C87F/3-6n	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	1
C87F/3-6o	SDC87E-1	blade-core frag (non-rejuv)	core section	indeterminate	2
C87F/3-6i	SDC87E-1	core section flake	-	-	1
C87F/3-6j	SDC87E-1	distal orientation flake	-	-	19
C87F/3-6k	SDC87E-1	lateral core rejuv	-	-	7
C87F/3-6a	SDC87E-1	macroflake	core shaping	-	3
C87F/3-6h	SDC87E-1	platform prep flake	-	-	51
C87F/3-6b	SDC87E-1	'small' percussion flake	core shaping	-	12
C87F/3-6l	SDC87E-1	striated core-top fragment	-	-	4
C87F/3-7b	SDC87E-1	bidirectional core	core section	lateral	1
C87F/3-7a	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87F/3-7c	SDC87E-1	objects from exhausted core	notched	lateral	1
C87F/3-5d	SDC87E-1	final series	blade	proximal	98
C87F/3-5a	SDC87E-1	initial series	blade	complete	1
C87F/3-5g	SDC87E-1	initial series	blade	overhang removal	2
C87F/3-5c	SDC87E-1	final series	blade	complete	26
C87F/3-5b	SDC87E-1	initial series	blade	complete and fragments	36
C87F/3-5f	SDC87E-1	final series	blade	distal	43
C87F/3-5e	SDC87E-1	final series	blade	medial	44
C87F/3-5h	SDC87E-1	distal orientation flake	-	-	3
C87G/1-3a	SDC87E-1	initial series	blade	proximal	1
C87G/1-3c	SDC87E-1	final series	blade	distal	1
C87G/1-3b	SDC87E-1	final series	blade	proximal	1
C87G/1-3g	SDC87E-1	bidirectional core	core section	proximal	2
C87G/1-3d	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87G/1-3e	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C87G/1-3f	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	1
C87G/1-4a	SDC87E-1	initial series	blade	complete	3
C87G/1-4b	SDC87E-1	final series	blade	proximal	3
C87G/1-4f	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	1
C87G/1-4d	SDC87E-1	distal orientation flake	-	-	7
C87G/1-4e	SDC87E-1	lateral core rejuv	-	-	2
C87G/1-4c	SDC87E-1	platform prep flake	-	-	3
C87G/1-5a	SDC87E-1	initial series	blade	proximal	1
C87G/1-5e	SDC87E-1	final series	blade	distal	2
C87G/1-5d	SDC87E-1	final series	blade	medial	4
C87G/1-5b	SDC87E-1	final series	blade	complete	7
C87G/1-5c	SDC87E-1	final series	blade	proximal	12
C87G/2-1a	SDC87E-1	macroblade	core shaping	-	1
C87G/2-2b	SDC87E-1	initial series	blade	complete and fragments	3
C87G/2-2c	SDC87E-1	platform prep flake	-	-	1
C87G/2-2a	SDC87E-1	'small' percussion flake	core shaping	-	1
C87G/2-4b	SDC87E-1	final series	blade	distal	1
C87G/2-4a	SDC87E-1	final series	blade	proximal	2
C87G/3-1e	SDC87E-1	final series	blade	distal	1
C87G/3-1b	SDC87E-1	initial series	blade	complete	5
C87G/3-1c	SDC87E-1	final series	blade	complete	9
C87G/3-1d	SDC87E-1	final series	blade	proximal	15
C87G/3-2f	SDC87E-1	cortical core-top fragment	-	-	1
C87G/3-1g	SDC87E-1	distal orientation flake	-	-	4
C87G/3-2e	SDC87E-1	distal orientation flake	-	-	8
C87G/3-1f	SDC87E-1	platform prep flake	-	-	1
C87G/3-2d	SDC87E-1	platform prep flake	-	-	11
C87G/3-1a	SDC87E-1	'small' percussion blade	core shaping	-	1
C87G/3-2c	SDC87E-1	final series	blade	complete	2
C87G/3-2b	SDC87E-1	initial series	blade	proximal	3
C87G/3-2g	SDC87E-1	various debitage	-	fragment	4
C87G/3-2a	SDC87E-1	'small' percussion blade	core shaping	-	3
C87G/3-3e	SDC87E-1	bidirectional core	core section	distal	1
C87G/3-3c	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	2
C87G/3-3d	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	3
C87G/3-3b	SDC87E-1	distal orientation flake	-	-	1
C87G/3-3a	SDC87E-1	platform prep flake	-	-	2
C87G/3-4a	SDC87E-1	objects from exhausted core	other	medial/lateral	1
C87G/3-4b	SDC87E-1	objects from exhausted core	other	striated core-top platform	1
C87G/4-1a	SDC87E-1	initial series	blade	complete	3
C87G/4-1d	SDC87E-1	various debitage	-	fragment	1
C87G/4-1c	SDC87E-1	distal orientation flake	-	-	1
C87G/4-1b	SDC87E-1	platform prep flake	-	-	5
C87G/4-2b	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal/ lateral	1
C87G/4-2c	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	2
C87G/4-2a	SDC87E-1	distal orientation flake	-	-	3
C87G/4-2d	SDC87E-1	objects from exhausted core	core section	medial/lateral	1
C87G/4-3a	SDC87E-1	initial series	blade	complete and fragments	2
C87G/4-3d	SDC87E-1	final series	blade	distal	3
C87G/4-3b	SDC87E-1	final series	blade	complete	5
C87G/4-3c	SDC87E-1	final series	blade	proximal	5
C87G/4-3f	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	1
C87G/4-3e	SDC87E-1	distal orientation flake	-	-	1

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C87G/5-6d	SDC87E-1	final series	blade	distal	1
C87G/5-6a	SDC87E-1	initial series	blade	complete and fragments	4
C87G/5-6c	SDC87E-1	final series	blade	medial	5
C87G/5-6b	SDC87E-1	final series	blade	proximal	6
C87G/5-7a	SDC87E-1	various debitage	-	fragment	1
C87G/7-1m	SDC87E-1	final series	blade	plunging distal	7
C87G/7-1o	SDC87E-1	initial series	blade	overhang removal	15
C87G/7-1p	SDC87E-1	final series	blade	complete	19
C87G/7-1q	SDC87E-1	final series	blade	proximal	41
C87G/7-1s	SDC87E-1	final series	blade	distal	43
C87G/7-1r	SDC87E-1	final series	blade	medial	68
C87G/7-1c	SDC87E-1	initial series	blade	complete and fragments	512
C87G/7-1t	SDC87E-1	various debitage	-	fragment	121
C87G/7-1v	SDC87E-1	bidirectional core	core section	distal	1
C87G/7-1h	SDC87E-1	blade-core frag (non-rejuv)	core section	proximal	11
C87G/7-1i	SDC87E-1	blade-core frag (non-rejuv)	core section	medial	6
C87G/7-1j	SDC87E-1	blade-core frag (non-rejuv)	core section	distal	4
C87G/7-1k	SDC87E-1	blade-core frag (non-rejuv)	core section	medial/lateral	35
C87G/7-1l	SDC87E-1	blade-core frag (non-rejuv)	core section	distal/ lateral	7
C87G/7-1n	SDC87E-1	blade-core frag (non-rejuv)	core section	indeterminate	21
C87G/7-1e	SDC87E-1	core section flake	-	-	5
C87G/7-1f	SDC87E-1	distal orientation flake	-	-	36
C87G/7-1u	SDC87E-1	faceted core-top fragment	-	-	4
C87G/7-1a	SDC87E-1	macroblade	core shaping	-	17
C87G/7-1d	SDC87E-1	platform prep flake	-	-	119
C87G/7-1b	SDC87E-1	'small' percussion blade	core shaping	-	33
C87G/7-1g	SDC87E-1	striated core-top fragment	-	-	10
C87H/1-2a	SDC87E-1	initial series	blade	proximal	1
C87H/1-2b	SDC87E-1	platform prep flake	-	-	2
C87H/1-3b	SDC87E-1	final series	blade	medial	1
C87H/1-3c	SDC87E-1	initial series	blade	complete	1
C87H/1-3a	SDC87E-1	final series	blade	prox/med	3
C88B/6-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C88B/7-9	constr. fill/refuse	final series	edge-mod. tool	medial	1
C88C/14-98a	SDC88C-1	adornment	ear flare	-	1
C88C/14-98b	SDC88C-1	adornment	ear flare	-	1
C88C/14-101	SDC88C-1	final series	drill	complete	1
C88C/14-25	SDC88C-1	final series	blade	medial	1
C88D/1-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C88D/2-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C88D/4-1	constr. fill/refuse	fragment	rejuv debitage?	-	1
C88D/5-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C88D/6-2	constr. fill/refuse	final series	blade	prox/med	1
C88E/2-1	constr. fill/refuse	final series	blade	prox/med	1
C89B/1-2	constr. fill/refuse	final series	blade	proximal	1
C89B/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C90A/2-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C90B/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C90B/4-1	constr. fill/refuse	platform prep flake	edge-mod. tool	-	1
C90B/4-2	constr. fill/refuse	platform prep flake	-	-	1
C90B/6-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C90B/6-2	constr. fill/refuse	fragment	-	-	1
C90B/9-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C90B/9-1b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1

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C90B/15-1	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial	1
C90C/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C90C/3-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C90C/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C90C/4-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C90C/4-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C90C/4-3a	constr. fill/refuse	final series	blade	proximal	1
C90C/4-3c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C90C/4-3d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C90C/4-3b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C90E/5-3	constr. fill/refuse	final series	blade	proximal	1
C90I/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C90J/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C90K/3-2	constr. fill/refuse	final series	blade	prox/med	1
C90I/2-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C90I/2-3a	constr. fill/refuse	final series	blade	prox/med	1
C90I/2-3b	constr. fill/refuse	final series	blade	medial	1
C91B/2-1	constr. fill/refuse	final series	edge-mod. tool	distal	1
C93C/1-1	constr. fill/refuse	final series	blade	proximal	1
C93D/1-2	constr. fill/refuse	point	biface	distal	1
C94D/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C95A/1-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C95A/1-2c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C95A/1-2d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C95A/1-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C95A/1-2g	constr. fill/refuse	final series	blade	distal	2
C95A/1-2e	constr. fill/refuse	final series	blade	proximal	3
C95A/1-2f	constr. fill/refuse	final series	blade	medial	4
C95A/1-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C95A/1-4	constr. fill/refuse	pressure flake	-	complete	1
C95B/1-33d	SD, but not assigned	final series	blade	proximal	1
C95B/1-33f	SD, but not assigned	final series	notched blade	medial	1
C95B/1-33e	SD, but not assigned	final series	blade	medial	1
C95B/1-33a	SD, but not assigned	final series	edge-mod. tool	prox/med	1
C95B/1-33c	SD, but not assigned	final series	blade	distal	2
C95B/1-33b	SD, but not assigned	final series	edge-mod. tool	medial	2
C95B/2-18	SDC95B-1	final series	blade	distal	1
C95C/1-1b	SD, but not assigned	final series	edge-mod. tool	medial	1
C95C/1-1c	SD, but not assigned	final series	blade	medial	1
C95C/1-1a	SD, but not assigned	final series	blade	prox/med	1
C95C/1-19	SD, but not assigned	final series	blade	medial	1
C95C/1-20	SD, but not assigned	final series	blade	distal	1
C95C/4-11	constr. fill/refuse	fragment	-	-	1
C95C/4-2b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C95C/4-2ad	constr. fill/refuse	final series	blade	distal	2
C95C/4-2c	constr. fill/refuse	final series	blade	medial	3
C95C/4-2a	constr. fill/refuse	final series	edge-mod. tool	medial	3
C95C/4-5	constr. fill/refuse	final series	blade	distal	1
C95C/7-10	constr. fill/refuse	final series	edge-mod. tool	medial	2
C95C/7-11b	constr. fill/refuse	fragment	-	-	2
C95C/7-11a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C95C/8-1a	SDC95C-4	object from blade core frag	notched	proximal/ lateral	1
C95C/8-1b	SDC95C-4	object from blade core frag	edge-mod. tool	plunging	1
C95C/8-1c	SDC95C-4	object from blade core frag	notched	medial/lateral	1

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C95C/8-2	SDC95C-4	object from blade core frag	notched	medial/lateral	1
C95C/8-3	SDC95C-4	object from blade core frag	notched	medial/lateral	1
C95C/8-4	SDC95C-4	final series	edge-mod. tool	prox/med	1
C95C/10-1	SDC95C-6	final series	blade	medial	1
C95C/12-4	constr. fill/refuse	final series	blade	proximal	2
C95C/13-8	constr. fill/refuse	final series	blade	medial	1
C95C/14-10	constr. fill/refuse	final series	blade	medial	1
C95C/14-7a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C95C/14-7c	constr. fill/refuse	final series	blade	prox/med	1
C95C/14-7b	constr. fill/refuse	final series	edge-mod. tool	medial	9
C95C/15-10	SDC95C-7	final series	blade	medial	1
C95C/16-13c	constr. fill/refuse	final series	edge-mod. tool	distal	1
C95C/16-13a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C95C/16-13d	constr. fill/refuse	final series	blade	medial	7
C95C/16-13b	constr. fill/refuse	final series	edge-mod. tool	medial	11
C95C/16-14a	constr. fill/refuse	fragment	-	-	4
C95C/16-14b	constr. fill/refuse	platform prep flake	-	-	1
C95C/17-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C95C/17-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C95C/19-3c	constr. fill/refuse	final series	blade	distal	1
C95C/19-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C95C/19-3b	constr. fill/refuse	final series	blade	medial	1
C95C/19-5a	constr. fill/refuse	chunk	-	-	1
C95C/19-5b	constr. fill/refuse	fragment	-	-	1
C95C/20-7	constr. fill/refuse	final series	lancet	med/dist	1
C95C/21-2	constr. fill/refuse	fragment	-	-	1
C95C/22-4a	SDC95C-8	final series	edge-mod. tool	prox/med	2
C95C/22-4b	SDC95C-8	final series	edge-mod. tool	med/dist	1
C95D/1-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C95D/1-1b	constr. fill/refuse	final series	blade	prox/med	1
C95D/1-1a	constr. fill/refuse	final series	blade	proximal	1
C95D/1-2	constr. fill/refuse	platform prep flake	-	-	1
C95D/2-2a	constr. fill/refuse	final series	blade	prox/med	3
C95D/2-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C95D/2-3	constr. fill/refuse	final series	blade	medial	2
C95D/3-3e	constr. fill/refuse	fragment	-	-	1
C95D/3-3d	constr. fill/refuse	final series	blade	distal	1
C95D/3-3a	constr. fill/refuse	final series	blade	proximal	2
C95D/3-3b	constr. fill/refuse	final series	blade	medial	5
C95D/3-3c	constr. fill/refuse	final series	edge-mod. tool	medial	6
C95D/3-4	constr. fill/refuse	final series	blade	medial	1
C95D/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C96A/2-2	constr. fill/refuse	fragment	-	-	1
C96A/3-2	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C96A/3-3	constr. fill/refuse	fragment	flake	distal	1
C96A/3-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C96A/3-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C96A/3-7	constr. fill/refuse	initial series	blade	complete	1
C96B/1-1a	constr. fill/refuse	final series	blade	prox/med	2
C96B/1-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C96B/1-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C96B/1-2b	constr. fill/refuse	final series	blade	medial	1
C96B/1-3b	constr. fill/refuse	fragment	-	-	1
C96B/1-3a	constr. fill/refuse	macroflake	core shaping	-	1

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C96B/2-5	constr. fill/refuse	final series	edge-mod. tool	medial	2
C96B/2-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C96B/2-2a	constr. fill/refuse	final series	blade	prox/med	3
C96B/2-3	constr. fill/refuse	fragment	-	-	1
C96B/2-4	constr. fill/refuse	final series	edge-mod. tool	med/dist	2
C96B/3-1	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C96C/1-11b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C96C/1-11a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C96D/1-5d	constr. fill/refuse	fragment	-	-	1
C96D/1-5c	constr. fill/refuse	final series	blade	distal	1
C96D/1-5a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C96D/1-5b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C96E/2-1	constr. fill/refuse	final series	blade	distal	1
C96E/6-1b	constr. fill/refuse	fragment	-	-	1
C96E/6-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C96E/7-3	constr. fill/refuse	final series	blade	prox/med	2
C96E/8-2c	constr. fill/refuse	fragment	-	-	2
C96E/8-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C96E/8-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C96E/9-1c	constr. fill/refuse	fragment	-	-	1
C96E/9-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C96E/9-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C96G/1-10	constr. fill/refuse	flake	edge-mod	-	1
C97B/2-1	constr. fill/refuse	final series	blade	medial	1
C98B/5-1a	constr. fill/refuse	final series	blade	distal	1
C98B/5-5a	constr. fill/refuse	final series	blade	proximal	1
C98B/6-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C98B/6-2a	constr. fill/refuse	initial series	blade	complete	1
C98B/7-1a	SDC98B-1	objects from exhausted core	eccentric	complete	1
C98B/7-1b	SDC98B-1	objects from exhausted core	eccentric	complete	1
C98B/7-2a	SDC98B-1	objects from exhausted core	eccentric	complete	1
C98B/7-3a	SDC98B-1	object from blade core frag	notched	complete	1
C98B/7-3b	SDC98B-1	object from blade core frag	notched	proximal/medial	1
C98B/7-4a	SDC98B-1	object from blade core frag	edge-mod. tool	proximal/medial	1
C98B/7-4b	SDC98B-1	object from blade core frag	edge-mod. tool	complete	1
C98B/7-6a	SDC98B-1	object from blade core frag	notched	complete	1
C98B/7-6b	SDC98B-1	object from blade core frag	notched	complete	1
C98B/7-3c	SDC98B-1	blade-core frag (non-rejuv)	edge-mod. tool	flake	1
C98B/7-9a	SDC98B-1	blade-core frag (non-rejuv)	-	flake	1
C98C/10-1a	SDC98C-1	final series	edge-mod. tool	distal	1
C98D/1-1a	constr. fill/refuse	final series	blade	medial	1
C99C/6-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C100C/3-1	constr. fill/refuse	platform prep flake	-	-	1
C101C/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C101D/4-3	SDC101D-2	final series	edge-mod. tool	medial	1
C101E/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C102B/5-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C102B/5-1b	constr. fill/refuse	final series	blade	prox/med	1
C102B/7-13	SDC102B-2	final series	edge-mod. tool	medial	1
C102B/7-1	SDC102B-2	final series	edge-mod. tool	prox/med	1
C102B/7-16c	SDC102B-2	final series	blade	medial	1
C102B/7-16a	SDC102B-2	final series	blade	complete	1
C102B/7-16b	SDC102B-2	final series	blade	prox/med	1
C102B/7-9	SDC102B-2	final series	edge-mod. tool	prox/med	1

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C102E/2-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C102E/2-1b	constr. fill/refuse	final series	blade	medial	1
C102E/4-1	constr. fill/refuse	final series	blade	medial	1
C103B/9-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C103C/6-1	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C103C/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C104B/1-1	constr. fill/refuse	exhausted core	-	complete	1
C104B/1-1a	constr. fill/refuse	exhausted core	-	complete	1
C104B/8-1a	constr. fill/refuse	final series	blade	medial	1
C104B/8-1	constr. fill/refuse	final series	blade	medial	1
C104C/4-2a	SDC104C-1	final series	edge-mod. tool	proximal	1
C104C/4-19a	SDC104C-1	final series	edge-mod. tool	medial	1
C104E/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C104E/3-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C104E/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C104E/5-1b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C104E/5-1b	constr. fill/refuse	final series	blade	distal	1
C104E/5-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C104E/5-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C105C/2-7	SDC105C-1	final series	blade	complete	1
C105C/2-9	SDC105C-1	final series	blade	prox/med	1
C106C/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C107C/2-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C107C/4-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C107C/4-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C107C/4-4c	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C107C/5-2	constr. fill/refuse	final series	blade	medial	1
C107D/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C107D/3-1a	constr. fill/refuse	final series	blade	prox/med	1
C108B/4-1	constr. fill/refuse	final series	blade	prox/med	1
C108C/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C108C/2-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C108C/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C108D/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C108D/3-1c	constr. fill/refuse	final series	blade	distal	1
C108D/3-1b	constr. fill/refuse	final series	blade	medial	1
C108D/3-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C108D/3-2	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C108D/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C109B/2-2a	SDC109B-1	bidirectional core section flake	notched	-	1
C109B/2-1b	SDC109B-1	fragment	edge-mod	distal	1
C109B/2-1a	SDC109B-1	final series	edge-mod. tool	medial	2
C109B/2-2b	SDC109B-1	final series	edge-mod. tool	medial	1
C109B/2-3a	SDC109B-1	final series	edge-mod. tool	prox/med	1
C109B/2-3b	SDC109B-1	final series	edge-mod. tool	med/dist	1
C109B/4-1a	SD, but not assigned	object from macroflake	notched	-	1
C109B/4-1b	SD, but not assigned	distal orientation flake	-	-	1
C109C/1-1	constr. fill/refuse	final series	blade	complete	1
C109C/2-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C109C/4-1	constr. fill/refuse	final series	blade	medial	2
C109D/1-2	constr. fill/refuse	final series	blade	medial	1
C109D/3-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C110C/3-1b	constr. fill/refuse	final series	edge-mod. tool	distal	1

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C110C/3-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C110D/5-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C110D/5-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C110E/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C110E/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C111D/3-1	constr. fill/refuse	initial series	blade	med/dist	1
C116B/2-2	constr. fill/refuse	fragment	-	-	1
C116B/12-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C116C/2-3a	SDC116C-1	blade-core frag (non-rejuv)	-	proximal/medial/lateral	1
C116C/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C116C/2-1a	constr. fill/refuse	final series	blade	proximal	1
C116C/2-2b	constr. fill/refuse	final series	blade	medial	1
C116C/2-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C116C/2-3b	SDC116C-1	object from blade core frag	uniface	distal/medial	1
C116C/3-1	SDC116C-1	bidirectional core frag	-	proximal/medial	1
C116C/4-3	SDC116C-1	blade-core frag (non-rejuv)	-	complete	1
C116C/4-2	constr. fill/refuse	final series	blade	medial	4
C116C/5-2	SDC116C-2	object from blade core frag	notched	complete	1
C116C/8-1	SDC116C-2	object from blade core frag	notched	complete	1
C116C/8-5a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C116C/8-5b	constr. fill/refuse	final series	blade	medial	3
C116C/9-6e	constr. fill/refuse	fragment	-	-	1
C116C/9-6c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C116C/9-6b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C116C/9-6a	constr. fill/refuse	final series	blade	prox/med	1
C116C/9-6d	constr. fill/refuse	final series	blade	medial	2
C116D/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C116D/2-1b	constr. fill/refuse	final series	blade	distal	1
C117B/2-6b	constr. fill/refuse	final series	blade	distal	1
C117B/2-6a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C117B/13-4	constr. fill/refuse	fragment	-	-	1
C117B/3-5c	constr. fill/refuse	final series	blade	distal	1
C117B/3-5a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C117B/3-5b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C117B/5-6b	SDC117B-1	object from blade core frag	uniface	medial/lateral	1
C117B/5-6c	SDC117B-1	object from blade core frag	uniface	proximal/medial/lateral	1
C117B/5-6d	SDC117B-1	object from blade core frag	notched	medial/distal/lateral	1
C117B/5-6e	SDC117B-1	object from blade core frag	notched	medial	1
C117B/5-6f	SDC117B-1	object from blade core frag	notched	medial	1
C117B/5-6g	SDC117B-1	object from blade core frag	notched	proximal/medial/lateral	1
C117B/5-6j	SDC117B-1	object from blade core frag	notched	medial/lateral	1
C117B/5-6k	SDC117B-1	object from blade core frag	notched	medial/lateral	1
C117B/5-6a	SDC117B-1	objects from exhausted core	notched	complete	1
C117B/5-6h	SDC117B-1	objects from exhausted core	notched	complete	1
C117B/5-6i	SDC117B-1	objects from exhausted core	notched	complete	1
C117B/5-7	SDC117B-1	objects from exhausted core	notched	medial	1
C117B/5-8a	SDC117B-1	final series	edge-mod. tool	plunging complete	1
C117B/5-9a	SDC117B-1	final series	edge-mod. tool	prox/med	3
C117B/5-8b	SDC117B-1	final series	edge-mod. tool	plunging complete	1
C117B/5-9c	SDC117B-1	final series	blade	distal	2
C117B/5-9b	SDC117B-1	final series	blade	medial	4
C117B/7-15	SDC117B-2	objects from exhausted core	notched	complete	1
C117B/7-16	SDC117B-2	object from blade core frag	notched	distal/medial	1
C117B/7-17	SDC117B-2	objects from exhausted core	notched	complete	1

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C117B/7-18	SDC117B-2	final series	-	plunging complete	1
C117B/7-21	SDC117B-2	objects from exhausted core	uniface	complete	1
C117B/7-22	SDC117B-2	faceted core-top fragment	complete	-	1
C117B/7-23	SDC117B-2	object from blade core frag	scraper	medial/lateral	1
C117B/7-24	SDC117B-2	objects from exhausted core	notched	complete	1
C117B/7-25	SDC117B-2	objects from exhausted core	notched	complete	1
C117B/7-26	SDC117B-2	object from blade core frag	notched	distal/medial	1
C117B/7-27	SDC117B-2	blade-core frag (non-rejuv)	notched	medial/lateral	1
C117B/7-28	SDC117B-2	objects from exhausted core	notched	complete	1
C117B/7-37	SDC117B-2	objects from exhausted core	notched	complete	1
C117B/7-38	SDC117B-2	objects from exhausted core	notched	complete	1
C117B/7-39	SDC117B-2	blade-core frag (non-rejuv)	-	medial/lateral	1
C117B/7-40	SDC117B-2	object from blade core frag	edge-mod. tool	medial/lateral	1
C117B/7-41	SDC117B-2	blade-core frag (non-rejuv)	-	medial/lateral	1
C117B/7-42	SDC117B-2	object from blade core frag	notched	complete	1
C117B/7-43	SDC117B-2	blade-core frag (non-rejuv)	-	proximal/medial	1
C117B/7-44	SDC117B-2	object from blade core frag	uniface	distal/medial	1
C117B/7-45	SDC117B-2	object from core rejuv debitage	notched	-	1
C117B/7-46	SDC117B-2	object from blade core frag	notched	complete	1
C117B/7-47	SDC117B-2	object from blade core frag	notched	complete	1
C117B/7-48	SDC117B-2	blade-core frag (non-rejuv)	other	medial	1
C117B/7-49	SDC117B-2	initial series	blade	medial	1
C117B/7-53	SDC117B-2	objects from exhausted core	notched	complete	1
C117B/7-56	SDC117B-2	final series	blade	prox/med	1
C117B/7-57	SDC117B-2	final series	blade	med/dist	1
C117B/7-6	SDC117B-2	blade-core frag (non-rejuv)	-	medial/lateral	1
C117B/7-50	SDC117B-2	final series	edge-mod. tool	plunging complete	1
C117B/7-51	SDC117B-2	final series	blade	complete	1
C117B/7-52	SDC117B-2	final series	blade	complete	1
C117B/7-54	SDC117B-2	final series	blade	med/dist	1
C117B/7-55	SDC117B-2	flake	-	-	1
C117B/7-59	SDC117B-2	final series	blade	prox/med	1
C117B/9-2	SDC117B-3	final series	blade	prox/med	1
C117B/11-9	SDC117B-4	final series	edge-mod. tool	prox/med	1
C117B/11-14	SDC117B-4	final series	blade	medial	1
C117B/12-62	SDC117B-5	final series	edge-mod. tool	medial	1
C117B/14-10	SDC117B-6	object from blade core frag	edge-mod. tool	medial	1
C117B/14-11	SDC117B-6	final series	blade	plunging complete	1
C117B/14-12	SDC117B-6	blade-core frag (non-rejuv)	-	medial	1
C117B/14-13	SDC117B-6	object from blade core frag	notched	proximal/medial/lateral	1
C117B/14-14	SDC117B-6	final series	notched blade	complete	1
C117B/14-15	SDC117B-6	final series	blade	plunging complete	1
C117B/14-16	SDC117B-6	object from blade core frag	notched	proximal/medial	1
C117B/14-17	SDC117B-6	object from blade core frag	notched	proximal/medial/lateral	1
C117B/14-18	SDC117B-6	object from blade core frag	notched	medial	1
C117B/14-19	SDC117B-6	objects from exhausted core	notched	complete	1
C117B/14-2	SDC117B-6	objects from exhausted core	notched	complete	1
C117B/14-20	SDC117B-6	objects from exhausted core	biface	complete	1
C117B/14-3	SDC117B-6	final series	edge-mod. tool	plunging medial	1
C117B/14-4	SDC117B-6	object from blade core frag	uniface	medial/distal/lateral	1
C117B/14-5	SDC117B-6	final series	blade	complete	1
C117B/14-8	SDC117B-6	object from blade core frag	biface	complete	1
C117B/14-9	SDC117B-6	object from blade core frag	notched	medial/lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C117B/14-6	SDC117B-6	platform prep flake	notched	-	1
C117B/48-1b	constr. fill/refuse	fragment	-	-	2
C117B/48-1a	constr. fill/refuse	lateral core rejuv	flake	-	1
C117C/2-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C117C/5-1	SD, but not assigned	striated core-top fragment	complete	-	1
C117C/5-2	SD, but not assigned	final series	blade	medial	1
C117C/7-8	constr. fill/refuse	final series	edge-mod. tool	medial	1
C117C/8-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C117C/9-3	constr. fill/refuse	point	biface	medial	1
C117C/12-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C117C/13-4b	SDC117C-4	final series	edge-mod. tool	prox/med	1
C117C/13-4a	SDC117C-4	final series	blade	proximal	1
C117C/13-4c	SDC117C-4	final series	edge-mod. tool	med/dist	1
C117C/14-1b	constr. fill/refuse	final series	blade	medial	1
C117C/14-1a	constr. fill/refuse	final series	blade	prox/med	1
C117F/4-2h	constr. fill/refuse	flakes	-	-	6
C117F/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C117F/4-2g	constr. fill/refuse	final series	notched blade	prox/med	1
C117F/4-2c	constr. fill/refuse	final series	blade	prox/med	2
C117F/4-2f	constr. fill/refuse	final series	blade	distal	2
C117F/4-2e	constr. fill/refuse	final series	blade	proximal	3
C117F/4-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	9
C117F/4-2b	constr. fill/refuse	final series	blade	medial	13
C117F/4-2d	constr. fill/refuse	final series	edge-mod. tool	medial	15
C117F/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C117F/5-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C117F/5-2b	constr. fill/refuse	final series	blade	medial	2
C117F/8-10a	SDC117F-1	final series	blade	prox/med	2
C117F/8-24	SDC117F-1	point	Stem B Point	complete	1
C117F/8-25	SDC117F-1	point	Stem B Point	complete	1
C117F/8-26	SDC117F-1	point	Stem B Point	complete	1
C117F/8-27	SDC117F-1	point	Stem B Point	complete	1
C117F/8-8a	SDC117F-1	final series	blade	med/dist	1
C117F/8-8f	SDC117F-1	final series	blade	complete	1
C117F/8-8g	SDC117F-1	final series	blade	complete	1
C117F/8-8h	SDC117F-1	final series	blade	complete	1
C117F/8-8i	SDC117F-1	final series	blade	complete	1
C117F/8-8j	SDC117F-1	final series	blade	complete	1
C117F/8-8k	SDC117F-1	final series	blade	complete	1
C117F/8-8d	SDC117F-1	final series	blade	complete	1
C117F/8-8e	SDC117F-1	final series	blade	complete	1
C117F/8-8c	SDC117F-1	final series	blade	complete	1
C117F/8-8b	SDC117F-1	final series	blade	complete	1
C117F/8-9c	SDC117F-1	final series	blade	medial	1
C117F/8-9a	SDC117F-1	final series	blade	complete	1
C117F/8-9b	SDC117F-1	final series	blade	prox/med	1
C117F/8-9d	SDC117F-1	final series	blade	distal	1
C117F/8-10c	SDC117F-1	final series	blade	distal	2
C117F/8-10b	SDC117F-1	final series	blade	medial	3
C117F/11-2d	constr. fill/refuse	final series	edge-mod. tool	medial	12
C117F/11-2e	constr. fill/refuse	final series	blade	distal	3
C117F/11-2c	constr. fill/refuse	final series	edge-mod. tool	prox/med	5
C117F/11-2a	constr. fill/refuse	final series	blade	prox/med	8
C117F/11-2b	constr. fill/refuse	final series	blade	medial	12

Catalog Number	Context	Description 1	Description 2	Part	n=
C117F/12-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C117F/12-1b	constr. fill/refuse	final series	blade	medial	1
C118B/7-2	constr. fill/refuse	final series	blade	medial	1
C118C/2-2	constr. fill/refuse	final series	blade	medial	1
C118C/8-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C118C/11-3	constr. fill/refuse	final series	edge-mod. tool	medial	3
C118C/15-3b	constr. fill/refuse	final series	blade	medial	1
C118C/15-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C118C/17-2	constr. fill/refuse	final series	blade	medial	1
C118C/18-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C118C/19-1a	constr. fill/refuse	final series	blade	medial	1
C118C/19-1b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C118C/24-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C118C/24-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C118D/1-1	constr. fill/refuse	initial series	blade	complete	1
C118D/6-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C118D/11-6	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C118D/22-8	constr. fill/refuse	final series	blade	medial	2
C118D/37-1	constr. fill/refuse	final series	blade	medial	2
C118D/40-3a	constr. fill/refuse	final series	blade	proximal	1
C118D/40-3c	constr. fill/refuse	final series	blade	medial	1
C118D/40-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C118D/49-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C118F/4-1	constr. fill/refuse	macroflake	core shaping	-	1
C118F/12-1	constr. fill/refuse	final series	blade	plunging distal	1
C118F/14-4b	constr. fill/refuse	final series	blade	complete	1
C118F/14-4a	constr. fill/refuse	initial series	edge-mod. tool	medial	1
C118F/14-4d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C118F/14-4c	constr. fill/refuse	final series	blade	medial	1
C118F/18-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C118F/20-6	constr. fill/refuse	final series	blade	complete	1
C118F/20-9a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C118F/20-9b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C118F/22-14	SDC118F-4	final series	edge-mod. tool	medial	1
C118F/22-6c	SDC118F-4	final series	edge-mod. tool	prox/med	1
C118F/22-6b	SDC118F-4	initial series	blade	complete	1
C118F/22-6d	SDC118F-4	final series	edge-mod. tool	medial	2
C118F/22-6a	constr. fill/refuse	fragment	-	-	1
C118F/22-8	SDC118F-4	final series	edge-mod. tool	prox/med	1
C118F/23-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C118F/24-3	SDC118F-6	pebble	pebble	complete	1
C118F/29-1a	constr. fill/refuse	final series	blade	prox/med	1
C118F/29-1c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C118F/29-1d	constr. fill/refuse	final series	blade	distal	1
C118F/29-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C118F/38-2	constr. fill/refuse	final series	blade	medial	1
C119B/5-6a	constr. fill/refuse	final series	blade	medial	1
C119C/4-2a	constr. fill/refuse	final series	blade	medial	1
C119C/6-1a	constr. fill/refuse	final series	blade	proximal	1
C119D/1-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C119D/1-2b	constr. fill/refuse	final series	blade	medial	1
C119D/2-2a	constr. fill/refuse	final series	blade	proximal	1
C119D/4-1a	constr. fill/refuse	exhausted core	-	medial/lateral	1
C119D/4-2a	constr. fill/refuse	final series	blade	distal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C119D/6-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C119D/6-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C119D/6-2b	constr. fill/refuse	final series	blade	medial	2
C119D/9-4a	constr. fill/refuse	final series	blade	proximal	3
C119D/9-4b	constr. fill/refuse	final series	blade	medial	3
C119E/6-3a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C119E/6-4a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C119E/12-3a	constr. fill/refuse	final series	blade	medial	1
C119F/4-2a	constr. fill/refuse	final series	blade	prox/med	1
C119F/5-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C119F/5-2b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C119F/8-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C119F/9-2a	constr. fill/refuse	final series	blade	medial	1
C119F/12-1a	constr. fill/refuse	final series	blade	proximal	1
C119F/13-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C119F/13-3a	constr. fill/refuse	final series	blade	medial	1
C120B/3-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C121B/1-21a	constr. fill/refuse	final series	blade	medial	1
C121B/1-3a	constr. fill/refuse	fragment	edge-mod	-	1
C121B/4-5a	SD, but not assigned	final series	blade	medial	2
C121B/8-11a	constr. fill/refuse	final series	blade	medial	1
C121B/8-11b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C121C/4-6a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C121C/4-6b	constr. fill/refuse	final series	blade	medial	1
C121C/5-2a	constr. fill/refuse	macroflake	edge-mod. tool	distal	1
C121C/9-2a	constr. fill/refuse	final series	blade	medial	1
C121C/11-1a	constr. fill/refuse	exhausted core	-	medial/lateral	1
C121C/11-14a	constr. fill/refuse	fragment	edge-mod. tool	proximal	1
C121C/11-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C121C/11-3b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C121C/12-8a	SDC121C-1	exhausted core	-	medial/lateral	1
C121C/15-3a	constr. fill/refuse	shatter	-	-	1
C121C/21-1a	constr. fill/refuse	final series	blade	med/dist	1
C121C/21-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C121C/22-3a	constr. fill/refuse	final series	edge-mod. tool	distal	1
C121C/24-10a	SDC121C-5	final series	edge-mod. tool	medial	1
C121C/27-1a	constr. fill/refuse	shatter	-	-	1
C121C/32-8b	constr. fill/refuse	final series	blade	medial	1
C121C/32-8a	constr. fill/refuse	final series	edge-mod. tool	medial	4
C121C/33-2a	constr. fill/refuse	final series	notched blade	med/dist	1
C123D/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C123D/7-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C124B/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C124B/2-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C124B/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C124B/5-2	SDC124B-1	final series	edge-mod. tool	medial	2
C124B/6-1	SDC124B-1	final series	blade	medial	1
C124C/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C124D/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C125B/12-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C125C/2-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C125D/1-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C125D/1-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C125D/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C125D/6-1	constr. fill/refuse	fragment	-	-	2
C125F/1-1	constr. fill/refuse	final series	blade	medial	1
C125F/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C127B/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C127C/3-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C127E/5-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C128B/1-1	constr. fill/refuse	point	biface	proximal portion	1
C129B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C129C/2-2	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial	1
C129D/2-1	constr. fill/refuse	fragment	-	-	1
C129D/2-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C129D/2-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C129D/3-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	4
C129D/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C130B/2-4	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C130D/4-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C131B/4-1	constr. fill/refuse	fragment	-	-	1
C132B/2-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C132C/1-1c	constr. fill/refuse	final series	blade	medial	1
C132C/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C132C/1-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C132C/2-1	constr. fill/refuse	flake	-	-	1
C132C/9-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C132D/2-1	constr. fill/refuse	flake	-	proximal	1
C132D/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C132D/3-1	constr. fill/refuse	fragment	-	-	2
C132D/3-2	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial	1
C132F/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C138B/3-3	constr. fill/refuse	blade production by-products	flake	complete	1
C138B/3-3a	constr. fill/refuse	blade artifacts	edge-mod. tool	medial	2
C138B/5-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C138B/5-3b	constr. fill/refuse	final series	blade	medial	1
C138B/6-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C138C/2-2	constr. fill/refuse	final series	hafted tool	prox/med	1
C138C/3-1a	SD, but not assigned	final series	edge-mod. tool	medial	1
C138C/3-1b	SD, but not assigned	final series	blade	medial	1
C138C/3-2a	SD, but not assigned	blade production by-products	flake	complete	2
C138C/3-2d	SD, but not assigned	fragment	-	-	2
C138C/3-2c	SD, but not assigned	initial series	blade	medial	1
C138C/3-2b	SD, but not assigned	initial series	blade	complete	2
C138C/4-2b	SDC138C-1	blade production by-products	other	complete and fragments	24
C138C/4-2a	SDC138C-1	initial series	blade	medial	5
C138C/4-2c	SDC138C-1	platform prep flake	indeterminate rejuv. deb?	-	13
C138C/4-3b	SDC138C-1	blade production by-products	bipolar	med/dist	1
C138C/4-3a	SDC138C-1	final series	-	prox/med	1
C138C/4-3c	SDC138C-1	initial series	blade	medial	4
C138C/5-3a	SD, but not assigned	initial series	blade	prox/med	2
C138C/5-3b	SD, but not assigned	initial series	blade	medial	2
C138C/5-4	SD, but not assigned	indeterminate rejuv debitage	fragment	-	10
C138C/6-3	SD, but not assigned	indeterminate rejuv debitage	fragment	-	14
C138C/7-7c	SDC138C-2	fragment	edge-mod	distal	1
C138C/7-7b	SDC138C-2	indeterminate rejuv debitage	complete	-	7
C138C/7-7a	SDC138C-2	platform prep flake	complete	-	2
C139C/3-3	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C140B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C140B/3-2	constr. fill/refuse	final series	blade	prox/med	1
C140C/1-4	constr. fill/refuse	final series	blade	prox/med	1
C140C/3-3b	constr. fill/refuse	final series	blade	medial	1
C140C/3-3a	constr. fill/refuse	final series	blade	prox/med	1
C140C/3-3c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C140C/3-4	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C140E/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C140F/2-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C140F/5-10c	constr. fill/refuse	fragment	-	-	2
C140F/5-10b	constr. fill/refuse	final series	blade	med/dist	1
C140F/5-10a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C140F/5-11	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C140F/7-3	constr. fill/refuse	final series	blade	medial	1
C140G/1-1	constr. fill/refuse	macroflake	edge-mod. tool	-	1
C140G/2-1	constr. fill/refuse	fragment	edge-mod	-	1
C140G/3-1a	constr. fill/refuse	final series	blade	medial	1
C140G/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C140G/3-1	SDC140G-1	final series	eccentric blade	plunging medial	1
C141B/3-4	SD, but not assigned	final series	lancet	complete	1
C141B/3-5a	SD, but not assigned	final series	blade	prox/med	2
C141B/3-5b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C141B/4-7a	SD, but not assigned	final series	blade	complete	3
C141B/4-7b	SD, but not assigned	final series	blade	prox/med	4
C141B/4-7c	SD, but not assigned	final series	blade	med/dist	13
C141C/6-5	constr. fill/refuse	final series	edge-mod. tool	medial	1
C141C/14-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C141H/4-7	constr. fill/refuse	final series	edge-mod. tool	medial	3
C143B/2-4	constr. fill/refuse	final series	blade	prox/med	1
C143B/3-1	constr. fill/refuse	fragment	-	-	1
C143B/3-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C143C/1-1	constr. fill/refuse	initial series	blade	prox/med	2
C143C/2-2f	constr. fill/refuse	final series	blade	distal	1
C143C/2-2e	constr. fill/refuse	final series	blade	distal	1
C143C/2-2d	constr. fill/refuse	initial series	blade	distal	1
C143C/2-2c	constr. fill/refuse	initial series	blade	medial	1
C143C/2-2b	constr. fill/refuse	initial series	blade	prox/med	2
C143C/2-2a	constr. fill/refuse	indeterminate rejuv debitage	-	-	1
C143C/2-2b	constr. fill/refuse	platform prep flake	-	-	3
C143C/3-1a	SDC143C-1	final series	edge-mod. tool	prox/med	1
C143C/3-1b	SDC143C-1	final series	edge-mod. tool	medial	1
C143C/3-1c	SDC143C-1	final series	blade	medial	1
C146A/2-1d	constr. fill/refuse	final series	edge-mod. tool	medial	4
C146A/2-1e	constr. fill/refuse	fragment	-	-	1
C146A/2-1c	constr. fill/refuse	initial series	blade	proximal	1
C146A/2-1b	constr. fill/refuse	final series	blade	proximal	1
C146A/2-1a	constr. fill/refuse	indeterminate rejuv debitage	flake	-	3
C147B/1-5	constr. fill/refuse	final series	blade	medial	1
C147B/2-7b	constr. fill/refuse	final series	blade	medial	1
C147B/2-7c	constr. fill/refuse	final series	blade	distal	1
C147B/2-7a	constr. fill/refuse	final series	edge-mod. tool	medial	4
C147B/4-4	constr. fill/refuse	final series	edge-mod. tool	medial	2
C147B/8-7	SDC147B-1	final series	edge-mod. tool	medial	1
C147B/8-8	SDC147B-1	fragment	blade-core frag?	-	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C147B/8-16	SDC147B-1	final series	edge-mod. tool	medial	1
C147C/2-4e	constr. fill/refuse	final series	edge-mod. tool	medial	1
C147C/2-4f	constr. fill/refuse	fragment	blade-core frag?	-	1
C147C/2-4d	constr. fill/refuse	final series	blade	distal	1
C147C/2-4a	constr. fill/refuse	final series	blade	prox/med	1
C147C/2-4c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C147C/2-4b	constr. fill/refuse	final series	blade	medial	3
C147C/3-6b	constr. fill/refuse	final series	blade	medial	1
C147C/3-6a	constr. fill/refuse	platform prep flake	-	-	1
C147C/4-6b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C147C/4-6d	constr. fill/refuse	final series	edge-mod. tool	medial	1
C147C/4-6c	constr. fill/refuse	final series	edge-mod. tool	medial	5
C147C/4-6a	constr. fill/refuse	platform prep flake	edge-mod. tool	-	1
C150B/1-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C150B/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C150B/2-2b	constr. fill/refuse	final series	blade	medial	1
C150B/2-2a	constr. fill/refuse	final series	blade	prox/med	1
C150B/2-3	constr. fill/refuse	chunk	-	-	1
C151B/1-1h	constr. fill/refuse	fragment	-	-	2
C151B/1-1e	constr. fill/refuse	initial series	blade	complete	1
C151B/1-1g	constr. fill/refuse	initial series	overhang removal	prox/med	1
C151B/1-1d	constr. fill/refuse	final series	edge-mod. tool	plunging distal	1
C151B/1-1c	constr. fill/refuse	final series	blade	medial	1
C151B/1-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C151B/1-1f	constr. fill/refuse	initial series	blade	medial	2
C151B/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	9
C151B/3-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C151B/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C151B/4-1b	constr. fill/refuse	fragment	-	-	4
C151B/4-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C151B/7-1b	constr. fill/refuse	fragment	-	-	2
C151B/7-1a	constr. fill/refuse	blade-core frag (non-rejuv)	-	proximal/ lateral	1
C151B/8-1b	constr. fill/refuse	final series	blade	medial	1
C151B/8-1a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C151B/8-1e	constr. fill/refuse	final series	edge-mod. tool	distal	1
C151B/8-1d	constr. fill/refuse	final series	notched blade	medial	1
C151B/8-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C151B/10-4	constr. fill/refuse	final series	blade	medial	1
C151C/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C151C/2-1	constr. fill/refuse	final series	blade	medial	1
C151C/4-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C151C/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C151C/8-1	constr. fill/refuse	final series	blade	medial	1
C151C/9-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C151C/9-3b	constr. fill/refuse	final series	blade	distal	1
C151C/11-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C151C/11-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C151C/11-2c	constr. fill/refuse	final series	blade	medial	2
C151C/12-1c	constr. fill/refuse	final series	blade	medial	1
C151C/12-1a	constr. fill/refuse	final series	blade	proximal	1
C151C/12-1b	constr. fill/refuse	final series	blade	medial	1
C151C/13-1c	constr. fill/refuse	final series	inlay	complete	1
C151C/13-1b	constr. fill/refuse	final series	blade	medial	3
C151C/13-1a	constr. fill/refuse	final series	edge-mod. tool	medial	8

Catalog Number	Context	Description 1	Description 2	Part	n=
C151C/13-2	constr. fill/refuse	final series	blade	proximal	1
C151C/14-2	constr. fill/refuse	point	biface	medial	1
C151C/14-6a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C151C/14-6c	constr. fill/refuse	final series	blade	medial	1
C151C/14-6d	constr. fill/refuse	final series	blade	distal	1
C151C/14-6b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C151C/15-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	4
C151C/15-1b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C151C/16-8b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C151C/16-8a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C152B/4-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C152B/5-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C152B/7-1b	constr. fill/refuse	flake	-	proximal	1
C152B/7-1a	constr. fill/refuse	final series	notched blade	prox/med	1
C152B/8-1	constr. fill/refuse	final series	blade	medial	2
C152B/9-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C152B/9-3	constr. fill/refuse	final series	blade	complete	1
C152B/11-2a	constr. fill/refuse	final series	blade	medial	1
C152B/11-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C152B/12-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C152B/13-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C152B/13-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C152B/13-1c	constr. fill/refuse	final series	blade	distal	2
C152B/15-3c	constr. fill/refuse	final series	blade	medial	1
C152B/15-3d	constr. fill/refuse	final series	blade	distal	1
C152B/15-3b	constr. fill/refuse	object from blade core frag	edge-mod. tool	medial/lateral	1
C152B/15-3a	constr. fill/refuse	platform prep flake	-	-	1
C152B/17-1	constr. fill/refuse	final series	blade	medial	1
C152B/18-1	constr. fill/refuse	final series	blade	medial	1
C152B/19-1	constr. fill/refuse	final series	notched blade	medial	1
C152C/1-4b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C152C/1-4a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C152C/1-4c	constr. fill/refuse	final series	edge-mod. tool	medial	5
C152C/2-3b	constr. fill/refuse	fragment	-	distal	1
C152C/2-3a	constr. fill/refuse	final series	blade	distal	1
C152C/3-4	constr. fill/refuse	final series	edge-mod. tool	medial	2
C153B/1-1b	constr. fill/refuse	fragment	drill?	distal	1
C153B/1-1a	constr. fill/refuse	final series	blade	medial	1
C153B/2-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C153B/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C153B/5-1a	constr. fill/refuse	final series	blade	medial	2
C153B/5-1b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C153B/6-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C153B/7-1f	constr. fill/refuse	fragment	-	-	1
C153B/7-1d	constr. fill/refuse	final series	blade	distal	1
C153B/7-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C153B/7-1c	constr. fill/refuse	final series	edge-mod. tool	medial	7
C153B/7-1e	constr. fill/refuse	object from blade core frag	edge-mod. tool	proximal/ lateral	1
C153B/7-1a	constr. fill/refuse	object from macroflake	edge-mod. tool	-	1
C153B/8-3a	constr. fill/refuse	fragment	-	-	1
C153B/8-3b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C153B/8-3c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C153B/10-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C153B/10-7c	constr. fill/refuse	flake	fragment	-	2

Catalog Number	Context	Description 1	Description 2	Part	n=
C153B/10-7b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C153C/1-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C153C/1-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C153C/2-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C153C/2-4b	constr. fill/refuse	final series	edge-mod. tool	medial	6
C153C/4-2a	constr. fill/refuse	final series	blade	prox/med	1
C153C/4-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C154B/1-1	constr. fill/refuse	final series	blade	medial	1
C154B/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C154B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C154B/5-3c	constr. fill/refuse	final series	blade	distal	1
C154B/5-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C154B/5-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C154B/6-1c	constr. fill/refuse	fragment	-	-	1
C154B/6-1a	constr. fill/refuse	final series	blade	proximal	1
C154B/6-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C154B/9-1c	constr. fill/refuse	fragment	edge-mod	-	2
C154B/9-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C154B/9-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C154B/10-1a	constr. fill/refuse	final series	blade	prox/med	1
C154B/10-1c	constr. fill/refuse	final series	blade	distal	1
C154B/10-1b	constr. fill/refuse	final series	edge-mod. tool	medial	7
C154B/11-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C154B/12-1b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C154B/12-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C154B/13-2d	constr. fill/refuse	fragment	-	-	2
C154B/13-2c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C154B/13-2a	constr. fill/refuse	final series	blade	proximal	2
C154B/13-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C154B/14-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C154B/14-1a	constr. fill/refuse	final series	blade	proximal	2
C154B/15-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C154B/15-1d	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C154B/15-1a	constr. fill/refuse	initial series	other	medial	2
C154B/15-1c	constr. fill/refuse	final series	edge-mod. tool	medial	5
C154B/15-1e	constr. fill/refuse	platform prep flake	-	-	1
C154B/16-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C154B/16-1b	constr. fill/refuse	final series	edge-mod. tool	medial	8
C154B/16-1c	constr. fill/refuse	platform prep flake	-	-	1
C155B/1-1c	constr. fill/refuse	final series	blade	distal	1
C155B/1-1a	constr. fill/refuse	final series	blade	proximal	1
C155B/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C155B/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C155B/6-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C155B/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C155B/9-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C155B/9-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C155B/9-1c	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C155B/10-1	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C155B/11-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C155B/12-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C155B/13-1b	constr. fill/refuse	fragment	-	-	1
C155B/13-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C155B/14-1	constr. fill/refuse	fragment	-	-	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C155B/15-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C155B/15-1b	constr. fill/refuse	fragment	macroblade?	medial	1
C155B/18-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C155B/19-1b	constr. fill/refuse	fragment	-	-	2
C155B/19-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C155B/20-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C155B/20-1b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C155B/21-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C156B/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C156B/4-2	constr. fill/refuse	final series	blade	medial	1
C156B/5-1	constr. fill/refuse	initial series	blade	prox/med	2
C156B/9-1	constr. fill/refuse	final series	edge-mod. tool	plunging distal	1
C156C/1-2	constr. fill/refuse	final series	blade	proximal	1
C156C/3-1	constr. fill/refuse	initial series	blade	medial	1
C156C/3-2b	constr. fill/refuse	fragment	platform prep?	-	1
C156C/3-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C156C/6-2	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C156C/7-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C157B/1-2g	constr. fill/refuse	final series	blade	plunging distal	1
C157B/1-2e	constr. fill/refuse	final series	edge-mod. tool	medial	1
C157B/1-2i	constr. fill/refuse	flake	platform prep?	-	1
C157B/1-2j	constr. fill/refuse	fragment	-	-	1
C157B/1-2h	constr. fill/refuse	final series	blade	distal	1
C157B/1-2f	constr. fill/refuse	final series	edge-mod. tool	distal	2
C157B/1-2c	constr. fill/refuse	final series	blade	medial	2
C157B/1-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C157B/1-2a	constr. fill/refuse	final series	blade	proximal	2
C157B/1-2d	constr. fill/refuse	final series	edge-mod. tool	medial	4
C157B/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C157B/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C157B/2-1c	constr. fill/refuse	blade-core frag (non-rejuv)	-	proximal	1
C157B/4-1a	constr. fill/refuse	final series	blade	prox/med	1
C157B/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C157C/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	6
C157C/1-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C157C/1-1d	constr. fill/refuse	final series	blade	distal	1
C157C/1-1c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C157C/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C157C/2-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C157C/3-3b	constr. fill/refuse	final series	blade	medial	1
C157C/3-3a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C157C/5-1c	constr. fill/refuse	final series	blade	medial	2
C157C/5-1e	constr. fill/refuse	fragment	-	-	2
C157C/5-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C157C/5-1a	constr. fill/refuse	final series	blade	prox/med	5
C157C/5-1d	constr. fill/refuse	final series	edge-mod. tool	medial	7
C157C/6-2a	constr. fill/refuse	final series	blade	prox/med	2
C157C/6-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C157C/6-2c	constr. fill/refuse	final series	blade	distal	1
C158B/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C158B/7-1	constr. fill/refuse	final series	blade	prox/med	1
C158B/14-1a	constr. fill/refuse	final series	blade	medial	1
C158B/14-1b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C158B/16-1d	constr. fill/refuse	fragment	blade-core frag?	-	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C158B/16-1a	constr. fill/refuse	final series	blade	prox/med	1
C158B/16-1b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C158B/16-1c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C158B/17-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C158B/17-1b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C158B/18-3a	constr. fill/refuse	final series	blade	prox/med	1
C158B/18-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C158B/19-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C158B/20-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C158B/22-1a	constr. fill/refuse	initial series	blade	medial	1
C158B/22-1c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C158B/22-1b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C158B/27-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C158B/28-6	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C158B/29-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C158B/30-1	constr. fill/refuse	final series	blade	prox/med	1
C158B/3-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C158B/32-1e	SDC158B-6	chunk	-	-	1
C158B/32-1d	SDC158B-6	final series	edge-mod. tool	med/dist	1
C158B/32-1a	SDC158B-6	final series	blade	proximal	1
C158B/32-1c	SDC158B-6	final series	blade	medial	1
C158B/32-1b	SDC158B-6	final series	edge-mod. tool	prox/med	1
C158D/1-4	constr. fill/refuse	final series	edge-mod. tool	medial	2
C158D/2-1a	constr. fill/refuse	biface	-	proximal	1
C158D/2-1c	constr. fill/refuse	fragment	-	-	1
C158D/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C158D/3-1c	constr. fill/refuse	fragment	biface?	-	1
C158D/3-1d	constr. fill/refuse	fragment	blade-core frag?	-	1
C158D/3-1a	constr. fill/refuse	final series	blade	prox/med	1
C158D/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C158D/5-1c	constr. fill/refuse	fragment	blade-core frag?	-	1
C158D/5-1b	constr. fill/refuse	final series	blade	medial	1
C158D/5-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C158D/6-1a	constr. fill/refuse	final series	blade	prox/med	1
C158D/6-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C158D/7-1	constr. fill/refuse	platform prep flake	-	-	1
C158D/8-2	constr. fill/refuse	core section flake	-	-	1
C158D/9-3b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C158D/9-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C158D/11-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C158E/1-2a	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C158E/1-2c	constr. fill/refuse	fragment	-	-	1
C158E/1-2b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C160B/5-2	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C160B/5-3	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C160B/8-1	constr. fill/refuse	fragment	edge-mod	distal	1
C160B/9-3	constr. fill/refuse	macroblade	core shaping	-	1
C160B/10-2b	constr. fill/refuse	final series	blade	medial	1
C160B/10-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160B/11-2a	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C160B/11-2b	constr. fill/refuse	final series	blade	medial	1
C160B/29-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160C/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160D/5-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C160G/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160G/11-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160G/11-1a	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C160H/5-9	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160H/5-16	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160H/6-3	constr. fill/refuse	final series	blade	proximal	1
C160H/11-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160H/14-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160I/3-1	constr. fill/refuse	platform prep flake	edge-mod. tool	-	1
C160J/8-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160J/17-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160K/2-1	constr. fill/refuse	fragment	-	-	1
C160K/2-2	constr. fill/refuse	final series	blade	prox/med	1
C160K/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160K/9-1	constr. fill/refuse	final series	blade	medial	1
C160L/1-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160L/1-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C160L/3-1	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C160L/6-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160L/7-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C160L/9-11c	constr. fill/refuse	final series	blade	prox/med	1
C160L/9-11d	constr. fill/refuse	final series	blade	proximal	1
C160L/9-11a	constr. fill/refuse	initial series	blade	complete	1
C160L/9-11f	constr. fill/refuse	final series	edge-mod. tool	med/dist	2
C160L/9-11b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C160L/9-11e	constr. fill/refuse	final series	edge-mod. tool	medial	3
C160L/11-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C160L/11-1a	constr. fill/refuse	final series	blade	prox/med	1
C160L/11-1b	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C160L/11-21	constr. fill/refuse	fragment	-	-	2
C160L/11-32a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C160L/11-32d	constr. fill/refuse	final series	blade	medial	1
C160L/11-32b	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C160L/11-32c	constr. fill/refuse	final series	edge-mod. tool	medial	6
C162E/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C162D/3-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C162D/4-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C163B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C163B/8-2	constr. fill/refuse	final series	edge-mod. tool	medial	3
C163B/9-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C163B/9-3c	constr. fill/refuse	final series	blade	med/dist	1
C163B/10-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164B/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	4
C164B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164B/3-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164B/3-5	constr. fill/refuse	final series	blade	medial	1
C164B/4-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164B/5-4d	SDC164B-1	final series	edge-mod. tool	med/dist	1
C164B/5-4b	SDC164B-1	final series	edge-mod. tool	prox/med	1
C164B/5-4a	SDC164B-1	final series	blade	prox/med	1
C164B/5-4c	SDC164B-1	final series	edge-mod. tool	medial	3
C164B/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164B/8-2	SDC164B-2	final series	blade	med/dist	1
C164B/9-5	constr. fill/refuse	final series	edge-mod. tool	prox/med	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C164B/10-3	constr. fill/refuse	final series	edge-mod. tool	medial	4
C164B/12-6	constr. fill/refuse	fragment	-	-	1
C164B/17-1b	SDC164B-4	final series	edge-mod. tool	prox/med	1
C164B/17-1c	SDC164B-4	final series	edge-mod. tool	medial	1
C164B/17-1a	SDC164B-4	final series	notched blade	complete	1
C164C/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164C/3-5c	constr. fill/refuse	fragment	-	-	1
C164C/3-5a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C164C/3-5b	constr. fill/refuse	final series	edge-mod. tool	medial	7
C164C/5-3b	constr. fill/refuse	final series	edge-mod. tool	medial	6
C164C/5-3c	constr. fill/refuse	final series	blade	medial	1
C164C/5-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C164D/2-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164D/4-6a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C164D/4-6b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C164D/4-6c	constr. fill/refuse	distal orientation flake	-	-	1
C164D/6-6	constr. fill/refuse	final series	blade	medial	1
C164D/7-5	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial	1
C164D/7-6c	constr. fill/refuse	fragment	-	-	1
C164D/7-6a	constr. fill/refuse	final series	blade	prox/med	1
C164D/7-6b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C164D/8-4b	constr. fill/refuse	fragment	-	-	1
C164D/8-4a	constr. fill/refuse	final series	blade	medial	1
C164D/10-5a	constr. fill/refuse	final series	blade	medial	4
C164D/10-5c	constr. fill/refuse	fragment	-	-	1
C164D/10-5b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C165B/2-4	constr. fill/refuse	edge-mod. Tool	-	-	1
C165B/2-5	constr. fill/refuse	final series	blade	medial	1
C165B/3-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C165B/4-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C165B/5-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C165B/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C165B/10-2c	constr. fill/refuse	final series	blade	med/dist	2
C165B/10-2b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C165B/10-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	5
C165B/10-3	constr. fill/refuse	final series	blade	med/dist	1
C165B/11-8a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C165B/11-8c	constr. fill/refuse	final series	blade	distal	1
C165B/11-8b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C165B/14-3a	constr. fill/refuse	final series	blade	prox/med	2
C165B/12-7b	constr. fill/refuse	final series	blade	medial	2
C165B/12-7a	constr. fill/refuse	final series	edge-mod. tool	medial	5
C165B/14-3b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C165B/15-5	constr. fill/refuse	final series	edge-mod. tool	medial	2
C165B/18-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C165B/20-2a	constr. fill/refuse	blade production by-products	blade	complete	1
C165B/20-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C166B/1-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C166B/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C166B/5-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C166B/6-3b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C166B/6-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C166B/7-3a	constr. fill/refuse	final series	blade	medial	1
C166B/7-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2

Catalog Number	Context	Description 1	Description 2	Part	n=
C166B/11-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C166B/13-3	constr. fill/refuse	final series	blade	medial	1
C167B/4-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C167C/1-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C173C/3-5b	constr. fill/refuse	fragment	edge-mod	-	1
C173C/3-5a	constr. fill/refuse	final series	blade	prox/med	1
C173C/5-6b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C173C/5-6a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C173C/11-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C173C/11-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C173D/2-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C173D/3-3	constr. fill/refuse	final series	blade	prox/med	1
C173D/5-2	constr. fill/refuse	final series	blade	distal	1
C173D/11-4	constr. fill/refuse	final series	blade	medial	2
C173D/12-2	constr. fill/refuse	biface	point	distal	1
C174C/8-5a	constr. fill/refuse	final series	blade	plunging distal	1
C174C/8-5b	constr. fill/refuse	final series	blade	medial	1
C174C/8-5c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174C/8-5d	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174C/10-2	constr. fill/refuse	cortical core-top	-	-	1
C174C/10-4c	constr. fill/refuse	final series	blade	medial	1
C174C/10-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C174C/10-4d	constr. fill/refuse	final series	blade	distal	2
C174C/10-4b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C174C/12-4	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C174C/12-6c	constr. fill/refuse	final series	blade	medial	1
C174C/12-6a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C174C/12-6b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C174C/13-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174C/13-1a	constr. fill/refuse	initial series	blade	complete	1
C174C/14-16c	constr. fill/refuse	final series	edge-mod. tool	prox/med	6
C174C/14-16e	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C174C/14-16g	constr. fill/refuse	final series	blade	distal	1
C174C/14-16a	constr. fill/refuse	initial series	blade	medial	2
C174C/14-16b	constr. fill/refuse	final series	blade	prox/med	2
C174C/14-16f	constr. fill/refuse	final series	blade	plunging distal	2
C174C/14-16d	constr. fill/refuse	final series	edge-mod. tool	medial	3
C174C/14-17	constr. fill/refuse	striated core-top	-	-	1
C174C/15-6	constr. fill/refuse	final series	edge-mod. tool	medial	4
C174C/16-4	constr. fill/refuse	final series	edge-mod. tool	medial	2
C174C/20-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174C/20-2a	constr. fill/refuse	blade-core frag (non-rejuv)	-	indeterminate	1
C174C/22-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174C/22-3c	constr. fill/refuse	final series	blade	medial	1
C174C/22-3b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C174C/23-2b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C174C/23-2a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C174D/3-2	constr. fill/refuse	platform prep flake	-	-	1
C174D/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174D/9-5	constr. fill/refuse	final series	blade	medial	1
C174D/11-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C174D/14-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174D/15-4	constr. fill/refuse	final series	edge-mod. tool	medial	2
C174D/15-6	constr. fill/refuse	final series	adornment	lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C174E/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	4
C174E/1-1b	constr. fill/refuse	final series	blade	medial	1
C174E/3-7c	constr. fill/refuse	fragment	-	-	2
C174E/3-7b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C174E/3-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C174E/3-8	constr. fill/refuse	blade-core frag (non-rejuv)	-	indeterminate	1
C174E/4-2b	constr. fill/refuse	fragment	-	-	1
C174E/4-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C174E/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C174E/8-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C174E/8-2a	constr. fill/refuse	initial series	blade	proximal	1
C174E/9-5	constr. fill/refuse	final series	blade	medial	3
C177B/2-3	constr. fill/refuse	final series	blade	prox/med	1
C177B/10-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C177B/20-4	constr. fill/refuse	final series	blade	medial	1
C177B/22-1	constr. fill/refuse	final series	blade	proximal	1
C177B/24-2	constr. fill/refuse	final series	blade	proximal	1
C177C/3-4	constr. fill/refuse	various debitage	-	fragment	1
C177D/3-10	SDC177D-1	objects from exhausted core	eccentric	lateral	1
C177D/3-11	SDC177D-1	object from blade core frag	eccentric	medial/lateral	1
C177D/3-4	SDC177D-1	edge modified flake	eccentric	lateral	1
C177D/3-5	SDC177D-1	object from blade core frag	uniface	lateral	1
C177D/3-6	SDC177D-1	object from blade core frag	eccentric	lateral	1
C177D/3-7	SDC177D-1	objects from exhausted core	eccentric	complete	1
C177D/3-8	SDC177D-1	final series	blade	plunging complete	1
C177D/3-9	SDC177D-1	edge modified flake	eccentric	lateral	1
C177D/11-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C177D/16-2	constr. fill/refuse	various debitage	-	fragment	1
C177D/16-3	constr. fill/refuse	core section flake	-	-	1
C177D/16-4	constr. fill/refuse	final series	blade	complete	1
C177D/22-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C177D/27-2	constr. fill/refuse	final series	blade	medial	1
C177D/31-8b	SDC177D-2	final series	edge-mod. tool	medial	1
C177D/31-8a	SDC177D-2	final series	edge-mod. tool	prox/med	3
C177D/34-1	constr. fill/refuse	exhausted core		medial	1
C177D/36-1	SDC177D-8	initial series	notched blade	complete	1
C177D/36-10	SDC177D-8	initial series	notched blade	complete	1
C177D/36-2	SDC177D-8	initial series	notched blade	complete	1
C177D/36-3	SDC177D-8	macroblade with cortex	notched	-	1
C177D/36-4	SDC177D-8	initial series	notched blade	prox/med	1
C177D/36-5	SDC177D-8	initial series	notched blade	complete	1
C177D/36-6	SDC177D-8	initial series	notched blade	complete	1
C177D/36-7	SDC177D-8	initial series	notched blade	complete	1
C177D/36-8	SDC177D-8	initial series	notched blade	complete	1
C177D/36-9	SDC177D-8	initial series	notched blade	complete	1
C177D/37-3a	constr. fill/refuse	final series	blade	proximal	1
C177D/37-3c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C177D/37-3b	constr. fill/refuse	final series	blade	prox/med	2
C177D/38-2	constr. fill/refuse	point	biface	medial	1
C177D/40-1	SDC177D-6	fragment	-	-	1
C177D/41-4	SDC177D-9	initial series	blade	medial	1
C177D/44-1	constr. fill/refuse	final series	blade	distal	1
C177D/46-1	SDC177D-9	object from blade core frag	-	proximal/ lateral	1
C177D/46-10	SDC177D-9	object from blade core frag	eccentric	complete	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C177D/46-16	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-17	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-18	SDC177D-9	object from blade core frag	eccentric	medial	1
C177D/46-19	SDC177D-9	object from blade core frag	eccentric	proximal/medial	1
C177D/46-2	SDC177D-9	final series	notched blade	plunging complete	1
C177D/46-20	SDC177D-9	object from blade core frag	eccentric	proximal/medial	1
C177D/46-21	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-3	SDC177D-9	object from blade core frag	eccentric	medial	1
C177D/46-31	SDC177D-9	final series	blade	plunging complete	1
C177D/46-32	SDC177D-9	objects from exhausted core	eccentric	lateral	1
C177D/46-33	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-34	SDC177D-9	object from blade core frag	eccentric	lateral	1
C177D/46-35	SDC177D-9	object from blade core frag	eccentric	proximal	1
C177D/46-36	SDC177D-9	final series	blade	plunging complete	1
C177D/46-37	SDC177D-9	object from blade core frag	-	medial/lateral	1
C177D/46-38	SDC177D-9	object from blade core frag	eccentric	proximal/medial	1
C177D/46-40	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-41	SDC177D-9	object from blade core frag	edge-mod. tool	proximal/ lateral	1
C177D/46-42	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-43	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-44	SDC177D-9	object from blade core frag	eccentric	distal/medial	1
C177D/46-45	SDC177D-9	object from blade core frag	eccentric	lateral	1
C177D/46-46	SDC177D-9	object from blade core frag	eccentric	proximal/medial	1
C177D/46-49	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-5	SDC177D-9	object from blade core frag	-	medial/lateral	1
C177D/46-50	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/46-51	SDC177D-9	object from blade core frag	eccentric	medial/lateral	1
C177D/46-6	SDC177D-9	object from blade core frag	-	proximal/ lateral	1
C177D/46-7	SDC177D-9	object from blade core frag	-	proximal/ lateral	1
C177D/46-9	SDC177D-9	object from blade core frag	edge-mod. tool	lateral	1
C177D/46-15	SDC177D-9	object from blade core frag	eccentric	medial/lateral	1
C177D/46-22	SDC177D-9	object from blade core frag	eccentric	medial	1
C177D/46-39	SDC177D-9	final series	blade	plunging complete	1
C177D/46-4	SDC177D-9	object from blade core frag	eccentric	distal/medial	1
C177D/46-47	SDC177D-9	object from blade core frag	eccentric	distal/medial	1
C177D/46-48	SDC177D-9	object from blade core frag	eccentric	distal/medial	1
C177D/46-8	SDC177D-9	objects from exhausted core	eccentric	complete	1
C177D/47-2	SDC177D-3	final series	edge-mod. tool	prox/med	1
C177D/48-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C177D/48-1a	constr. fill/refuse	final series	blade	proximal	2
C177D/51-2	constr. fill/refuse	final series	blade	prox/med	2
C177D/52-23	SDC177D-7	objects from core rejuv debitage	core section	complete	1
C177D/52-24	SDC177D-7	macroflake	notched	-	1
C177D/52-25	SDC177D-7	macroflake	notched	-	1
C177D/52-26	SDC177D-7	macroblade	notched	-	1
C177D/52-27	SDC177D-7	initial series	notched blade	complete	1
C177D/52-29	SDC177D-7	object from core rejuv debitage	notched core section	-	1
C177D/52-28b	SDC177D-7	fragment	-	-	1
C177D/52-28a	SDC177D-7	final series	blade	prox/med	1
C177D/56-3	SDC177D-7	macroblade with cortex	notched, edge modified	-	1
C177D/56-2	constr. fill/refuse	final series	blade	distal	1
C177D/58-2a	constr. fill/refuse	final series	blade	proximal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C177D/58-2b	constr. fill/refuse	final series	blade	medial	2
C177E/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C177F/9-4	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C178C/1-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C178C/2-3b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C178C/2-3a	constr. fill/refuse	final series	blade	prox/med	2
C178C/5-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C178C/7-1a	constr. fill/refuse	final series	blade	prox/med	1
C178C/7-1b	constr. fill/refuse	final series	blade	medial	2
C178C/8-4a	SDC178C-1	final series	lancet	complete	4
C178C/8-5b	SDC178C-1	final series	blade	prox/med	5
C178C/8-5a	SDC178C-1	final series	blade	complete	5
C178C/8-4b	SDC178C-1	final series	lancet	med/dist	2
C178C/8-6b	SDC178C-1	final series	edge-mod. tool	prox/med	1
C178C/8-6d	SDC178C-1	final series	edge-mod. tool	medial	2
C178C/8-6a	SDC178C-1	final series	blade	prox/med	11
C178C/8-6c	SDC178C-1	final series	blade	medial	12
C178C/9-1	constr. fill/refuse	final series	blade	medial	1
C178C/10-3	SD, but not assigned	platform prep flake	edge-mod. tool	-	1
C178C/10-2	SD, but not assigned	final series	lancet	complete	3
C178C/10-4d	SD, but not assigned	final series	blade	med/dist	1
C178C/10-4a	SD, but not assigned	final series	blade	complete	1
C178C/10-4c	SD, but not assigned	final series	blade	medial	1
C178C/10-4b	SD, but not assigned	final series	blade	prox/med	3
C178C/11-1a	SD, but not assigned	final series	edge-mod. tool	prox/med	1
C178C/11-1b	SD, but not assigned	final series	blade	prox/med	1
C178C/11-1c	SD, but not assigned	final series	blade	med/dist	1
C178C/13-2	SDC178C-1	macroblade	edge-modified	-	1
C178C/13-1	SD, but not assigned	final series	blade	medial	1
C178C/14-5	SD, but not assigned	final series	blade	prox/med	1
C178C/19-3	SD, but not assigned	final series	blade	prox/med	1
C179B/4-5	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179B/6-3a	constr. fill/refuse	final series	edge-mod. tool	plunging medial/distal	1
C179B/6-3b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C179B/7-14	constr. fill/refuse	biface	-	medial	1
C179B/7-13a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C179B/7-13b	constr. fill/refuse	final series	blade	medial	1
C179B/7-8b	constr. fill/refuse	final series	edge-mod. tool	distal	1
C179B/7-8a	constr. fill/refuse	final series	edge-mod. tool	medial	4
C179B/8-5	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179B/10-5	constr. fill/refuse	final series	blade	medial	1
C179B/12-5a	constr. fill/refuse	final series	blade	proximal	1
C179B/12-5b	constr. fill/refuse	final series	blade	prox/med	1
C179B/12-5d	constr. fill/refuse	final series	blade	distal	1
C179B/12-5c	constr. fill/refuse	final series	blade	medial	2
C179B/14-1	constr. fill/refuse	objects from exhausted core	biface	proximal/medial	1
C179B/14-4	constr. fill/refuse	fragment	-	-	2
C179B/19-2	constr. fill/refuse	final series	blade	medial	1
C179B/26-1c	SDC179B-7	final series	edge-mod. tool	medial	5
C179B/26-1d	SDC179B-7	fragment	-	-	1
C179B/26-1a	SDC179B-7	final series	edge-mod. tool	prox/med	1
C179B/26-1b	SDC179B-7	final series	edge-mod. tool	medial	1
C179B/26-22f	SDC179B-7	fragment	-	-	1
C179B/26-22e	SDC179B-7	final series	blade	distal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C179B/26-22c	SDC179B-7	final series	blade	medial	2
C179B/26-22d	SDC179B-7	final series	blade	med/dist	2
C179B/26-22a	SDC179B-7	final series	edge-mod. tool	prox/med	4
C179B/26-22b	SDC179B-7	final series	edge-mod. tool	medial	8
C179B/26-33	SDC179B-7	final series	edge-mod. tool	plunging medial/distal	1
C179C/2-1	constr. fill/refuse	fragment	blade-core frag?	-	1
C176C/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179D/4-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179G/4-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179D/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179D/10-1	constr. fill/refuse	final series	edge-mod. tool	medial	5
C179D/10-2	constr. fill/refuse	chunk	-	-	1
C179D/11-1	SD, but not assigned	final series	edge-mod. tool	medial	1
C179D/11-3	SD, but not assigned	point	small Stem B Point?	complete	1
C179D/11-4a	SD, but not assigned	initial series	edge-mod. tool	overhang removal	1
C179D/11-4b	SD, but not assigned	initial series	blade	prox/med	4
C179D/11-4g	SD, but not assigned	final series	blade	med/dist	1
C179D/11-4h	SD, but not assigned	final series	edge-mod. tool	med/dist	1
C179D/11-4f	SD, but not assigned	final series	notched blade	medial	1
C179D/11-4e	SD, but not assigned	final series	blade	medial	2
C179D/11-4c	SD, but not assigned	final series	edge-mod. tool	prox/med	10
C179D/11-4d	SD, but not assigned	final series	edge-mod. tool	medial	11
C179D/11-4i	SD, but not assigned	blade-core frag (non-rejuv)	-	indeterminate	1
C179D/12-11	SDC179D-1	final series	blade	med/dist	1
C179D/12-12	SDC179D-1	final series	blade	complete	1
C179D/12-13	SDC179D-1	final series	edge-mod. tool	plunging complete	1
C179D/12-14	SDC179D-1	core section flake		-	1
C179D/12-4	SDC179D-1	objects from exhausted core	eccentric	medial	1
C179D/12-5	SDC179D-1	final series	edge-mod. tool	plunging complete	1
C179D/12-6	SDC179D-1	objects from exhausted core	eccentric	complete	1
C179D/12-7	SDC179D-1	objects from exhausted core	uniface	lateral	1
C179D/12-8	SDC179D-1	objects from exhausted core	notched	proximal/medial	1
C179D/12-9	SDC179D-1	objects from exhausted core	eccentric	complete	1
C179D/12-10	SDC179D-1	final series	blade	prox/med	1
C179D/12-15b	SDC179D-1	final series	blade	medial	1
C179D/12-15a	SDC179D-1	final series	edge-mod. tool	prox/med	1
C179D/12-15c	SDC179D-1	final series	blade	med/dist	2
C179D/13-1	constr. fill/refuse	'small' percussion blade	core shaping	-	1
C179D/14-2a	constr. fill/refuse	initial series	blade	prox/med	1
C179D/14-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C179D/15-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C179D/16-5c	constr. fill/refuse	final series	blade	distal	1
C179D/16-5a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C179D/16-5b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C179D/20-4	SDC179D-2	final series	edge-mod. tool	medial	2
C179E/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179E/6-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C179E/6-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179E/9-3	constr. fill/refuse	fragment	blade-core frag?	-	1
C179F/5-4	constr. fill/refuse	final series	edge-mod. tool	medial	2
C179F/6-4	constr. fill/refuse	final series	blade	medial	1
C179F/7-5	constr. fill/refuse	final series	notched blade	prox/med	2
C179F/8-6b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179F/8-6a	constr. fill/refuse	final series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C179F/10-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C179F/10-4c	constr. fill/refuse	flake	pointed flake tool	-	1
C179F/10-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179F/11-6	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179F/11-8	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179F/12-3a	constr. fill/refuse	final series	blade	prox/med	1
C179F/12-3c	constr. fill/refuse	final series	notched blade	medial	1
C179F/12-3b	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C179F/13-3	constr. fill/refuse	final series	edge-mod. tool	medial	2
C179G/2-1	constr. fill/refuse	final series	blade	medial	1
C179G/10-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179G/10-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C179G/10-1a	constr. fill/refuse	final series	blade	prox/med	2
C179G/13-10	constr. fill/refuse	blade-core frag (non-rejuv)	-	indeterminate	1
C179G/13-9	constr. fill/refuse	final series	notched blade	prox/med	1
C179G/14-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179G/15-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C179G/18-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C179G/18-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179G/18-2	constr. fill/refuse	final series	blade	prox/med	1
C179G/19-5	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C179G/20-3	constr. fill/refuse	final series	blade	medial	1
C179G/21-3	constr. fill/refuse	final series	blade	med/dist	1
C179G/23-4a	constr. fill/refuse	initial series	blade	prox/med	1
C179G/23-4c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C179G/23-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179G/25-1	constr. fill/refuse	final series	blade	distal	1
C179H/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179H/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	3
C179H/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C179F/14-3a	constr. fill/refuse	final series	blade	prox/med	1
C179F/14-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C180B/7-12a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180B/7-12b	constr. fill/refuse	final series	blade	medial	1
C180B/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180B/8-1	constr. fill/refuse	inlay	ground flake?	-	1
C180B/8-8d	constr. fill/refuse	fragment	-	-	1
C180B/8-8a	constr. fill/refuse	final series	blade	proximal	1
C180B/8-8b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C180B/8-8c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C180B/10-56b	SDC180B-2	final series	edge-mod. tool	prox/med	1
C180B/10-56a	SDC180B-2	final series	edge-mod. tool	proximal	1
C180B/10-56d	SDC180B-2	final series	blade	distal	1
C180B/10-56c	SDC180B-2	final series	edge-mod. tool	medial	3
C180C/3-3a	constr. fill/refuse	final series	blade	proximal	1
C180C/3-3b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180C/4-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180C/5-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180C/6-3	constr. fill/refuse	final series	blade	medial	1
C180D/10-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180D/17-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180D/17-1a	constr. fill/refuse	final series	blade	proximal	1
C180D/21-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180D/25-2	constr. fill/refuse	blade-core frag (non-rejuv)	-	proximal/medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C180D/26-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180D/28-7c	constr. fill/refuse	final series	notched blade	medial	1
C180D/28-7b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C180D/28-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	6
C180D/29-7	SDC180D-1	point	bipointed tool?	distal	1
C180D/29-6a	constr. fill/refuse	final series	blade	prox/med	1
C180D/29-6b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180D/29-6c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C180D/30-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180D/30-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180D/31-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180D/32-3	constr. fill/refuse	final series	edge-mod. tool	medial	2
C180D/33-4	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180D/36-6b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C180D/36-6a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C180D/37-3b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180D/37-3a	constr. fill/refuse	final series	blade	proximal	1
C180D/37-3c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C180D/40-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180D/41-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C180E/4-4a	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C180E/4-4b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C180E/4-4c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C180E/5-8b	constr. fill/refuse	fragment	-	-	1
C180E/5-8a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C180E/11-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180E/18-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C180E/21-4	constr. fill/refuse	final series	blade	distal	1
C181B/19-1	constr. fill/refuse	final series	blade	complete	1
C181B/25-1	constr. fill/refuse	final series	blade	medial	1
C181B/26-4c	constr. fill/refuse	flake	platform prep?	-	1
C181B/26-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C181B/26-4b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C181B/26-5	constr. fill/refuse	platform prep flake	disk	-	1
C181B/27-1	constr. fill/refuse	final series	blade	med/dist	1
C181B/29-8	constr. fill/refuse	final series	blade	medial	1
C181B/33-2	constr. fill/refuse	final series	blade	prox/med	2
C181B/34-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C181B/34-5b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C181B/34-5a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C181B/35-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C181B/35-1	constr. fill/refuse	final series	blade	distal	1
C181B/35-2b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C181B/35-2d	constr. fill/refuse	final series	blade	med/dist	2
C181B/35-2c	constr. fill/refuse	final series	edge-mod. tool	medial	3
C181B/38-1	constr. fill/refuse	final series	blade	medial	1
C181B/41-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C181B/41-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C181B/51-1	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C181C/5-1	constr. fill/refuse	chunk	blade-core frag?	-	1
C181E/3-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C181E/6-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C181E/6-4	constr. fill/refuse	flake	-	-	1
C181E/6-5	constr. fill/refuse	final series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C181F/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C181G/11-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C182B/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C182B/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C182B/9-5	constr. fill/refuse	macroblade	core shaping	-	1
C182B/10-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C182B/11-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C182B/14-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182B/14-1b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C182B/15-1	constr. fill/refuse	final series	blade	medial	1
C182B/15-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C182B/16-6	constr. fill/refuse	final series	blade	medial	1
C182B/16-7a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C182B/16-7b	constr. fill/refuse	final series	blade	prox/med	1
C182B/16-7e	constr. fill/refuse	final series	blade	distal	1
C182B/16-7c	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182B/16-7d	constr. fill/refuse	final series	edge-mod. tool	medial	2
C182B/17-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182C/1-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182C/1-2b	constr. fill/refuse	flake	-	-	1
C182C/2-3b	constr. fill/refuse	final series	blade	medial	1
C182C/2-3c	constr. fill/refuse	final series	blade	distal	1
C182C/2-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182C/6-2b	constr. fill/refuse	final series	blade	medial	1
C182C/6-2a	constr. fill/refuse	final series	blade	prox/med	1
C182C/7-3	constr. fill/refuse	shatter	-	-	1
C182D/1-11c	constr. fill/refuse	final series	blade	distal	1
C182D/1-11a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182D/1-11d	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C182D/1-11b	constr. fill/refuse	final series	blade	medial	2
C182D/2-4a	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C182D/2-4b	constr. fill/refuse	final series	blade	distal	1
C182D/4-1	constr. fill/refuse	initial series	blade	prox/med	1
C182D/5-1	constr. fill/refuse	final series	blade	medial	1
C182D/5-2	constr. fill/refuse	final series	blade	medial	1
C182D/6-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182D/6-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C182E/4-1	constr. fill/refuse	final series	blade	distal	1
C182E/14-7	constr. fill/refuse	core section flake	edge-mod. tool	-	1
C182E/16-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C182E/16-10	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C182E/22-3	constr. fill/refuse	blade-core frag (non-rejuv)	-	distal/ lateral	1
C182E/30-4	constr. fill/refuse	flake	fragment	distal	1
C182E/31-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C182E/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C183B/1-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183B/1-2b	constr. fill/refuse	final series	edge-mod. tool	plunging medial/distal	1
C183B/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183B/2-1a	constr. fill/refuse	initial series	blade	prox/med	1
C183D/4-2	constr. fill/refuse	final series	blade	prox/med	1
C183E/1-8a	constr. fill/refuse	macroblade	core shaping	-	1
C183E/1-8b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C183E/3-8	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183F/1-2a	constr. fill/refuse	final series	blade	distal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C183F/1-2b	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C183F/2-3a	constr. fill/refuse	final series	blade	medial	1
C183F/2-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C183F/4-12b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C183F/4-12a	constr. fill/refuse	final series	blade	prox/med	1
C183F/5-6	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183F/6-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183F/8-4a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C183F/8-4b	constr. fill/refuse	shatter	-	-	1
C183G/2-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C183H/2-8	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183H/11-7	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C183H/16-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C183J/2-1	constr. fill/refuse	final series	blade	prox/med	1
C183J/4-2c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183J/4-2b	constr. fill/refuse	final series	blade	medial	1
C183J/4-2a	constr. fill/refuse	final series	blade	prox/med	1
C183J/4-2d	constr. fill/refuse	shatter	-	-	1
C183J/5-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C183J/5-3b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C183J/7-6	constr. fill/refuse	final series	edge-mod. tool	medial	2
C183J/11-10	constr. fill/refuse	final series	blade	medial	1
C183J/11-1b	constr. fill/refuse	final series	blade	medial	2
C183J/11-1a	constr. fill/refuse	final series	blade	prox/med	4
C184B/16-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184B/16-1a	constr. fill/refuse	final series	blade	medial	1
C184B/18-1	constr. fill/refuse	initial series	blade	prox/med	1
C184B/18-10	constr. fill/refuse	final series	blade	medial	1
C184B/26-9a	SDC184B-4	final series	edge-mod. tool	prox/med	1
C184B/26-9b	SDC184B-4	final series	blade	prox/med	1
C184B/26-9c	SDC184B-4	final series	blade	medial	1
C184B/26-10	SDC184B-4	core section flake	-	-	1
C184B/26-11	SDC184B-4	macroblade	core shaping	-	1
C184B/26-12	SDC184B-4	platform prep flake	notched	-	1
C184B/26-13	SDC184B-4	macroflake	core shaping	-	1
C184B/26-15	SDC184B-4	platform prep flake	edge-mod. tool	-	1
C184B/26-16	SDC184B-4	'small' percussion blade	core shaping	-	1
C184B/26-17	SDC184B-4	core section flake	-	-	1
C184B/26-18	SDC184B-4	macroflake	core shaping	-	1
C184B/26-19	SDC184B-4	platform prep flake	-	-	1
C184B/26-14	SDC184B-4	'small' percussion blade	core shaping	-	1
C184B/29-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C184B/30-1	SDC184B-5	bidirectional core	-	complete	1
C184B/30-10	SDC184B-5	bidirectional core	-	medial/lateral	1
C184B/30-11	SDC184B-5	core section flake	-	-	1
C184B/30-12	SDC184B-5	macroblade	core shaping	-	1
C184B/30-13	SDC184B-5	indeterminate rejuv debitage	edge-mod. tool	-	1
C184B/30-14	SDC184B-5	indeterminate rejuv debitage	-	-	1
C184B/30-15	SDC184B-5	'small' percussion blade	core shaping	-	1
C184B/30-2	SDC184B-5	bidirectional core	-	complete	1
C184B/30-3	SDC184B-5	exhausted core	-	complete	1
C184B/30-4	SDC184B-5	bidirectional core	-	proximal/medial	1
C184B/30-5	SDC184B-5	bidirectional core	-	complete	1
C184B/30-6	SDC184B-5	exhausted core	-	complete	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C184B/30-7	SDC184B-5	cortical core-top fragment	-	-	1
C184B/30-8	SDC184B-5	cortical core-top fragment	-	-	1
C184B/30-9	SDC184B-5	'small' percussion blade	core shaping	-	1
C184B/31-5	SD, but not assigned	'small' percussion blade	notched	-	1
C184B/31-6	SD, but not assigned	exhausted core	-	distal	1
C184B/32-1	SD, but not assigned	object from core rejuv debitage	edge-mod. tool	-	1
C184B/32-2	SD, but not assigned	'small' percussion blade	notched	-	1
C184B/33-4	SDC184B-6	final series	edge-mod. tool	prox/med	1
C184C/4-1	constr. fill/refuse	final series	blade	medial	1
C184C/5-5b	constr. fill/refuse	flake	platform prep?	-	1
C184C/5-5a	constr. fill/refuse	final series	blade	medial	2
C184C/6-5	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184C/7-1	constr. fill/refuse	final series	blade	medial	1
C184C/10-2	constr. fill/refuse	final series	blade	medial	1
C184D/12-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184D/25-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184D/37-15a	SDC184D-6	final series	blade	prox/med	2
C184D/37-15c	SDC184D-6	flake	platform prep?	-	2
C184D/37-15b	SDC184D-6	final series	blade	distal	2
C184E/6-2a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C184E/6-2b	constr. fill/refuse	final series	blade	medial	3
C184E/7-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184E/8-3	constr. fill/refuse	final series	blade	medial	2
C184E/9-1	constr. fill/refuse	final series	edge-mod. tool	medial	3
C184E/10-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184F/1-1	constr. fill/refuse	flake	platform prep?	-	1
C184F/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184G/1-1	constr. fill/refuse	final series	blade	distal	1
C184G/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184G/1-3b	constr. fill/refuse	final series	blade	prox/med	1
C184G/1-3a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C184G/2-2	constr. fill/refuse	fragment	-	-	1
C184G/3-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184G/6-5	constr. fill/refuse	lateral core rejuv	edge-mod. tool	-	1
C184G/6-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184G/6-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C184G/6-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C184G/8-4	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C184G/10-6b	constr. fill/refuse	final series	blade	medial	1
C184G/10-6a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185B/1-1b	constr. fill/refuse	fragment	-	-	1
C185B/1-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185B/2-1	constr. fill/refuse	fragment	-	-	2
C185B/3-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185B/3-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C185B/3-1b	constr. fill/refuse	final series	blade	medial	4
C185B/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185B/4-1c	constr. fill/refuse	fragment	-	-	1
C185B/4-1a	constr. fill/refuse	initial series	blade	prox/med	1
C185B/5-1b	constr. fill/refuse	fragment	-	-	1
C185B/5-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185B/7-5a	SDC185B-4	final series	blade	prox/med	1
C185B/7-5b	SDC185B-4	final series	edge-mod. tool	prox/med	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C185B/7-6b	SDC185B-4	fragment	-	-	1
C185B/7-6a	SDC185B-4	final series	blade	medial	1
C185B/7-7	SDC185B-4	chunk	-	-	1
C185B/9-1b	constr. fill/refuse	fragment	various	-	4
C185B/9-1a	constr. fill/refuse	final series	blade	medial	1
C185B/14-1	constr. fill/refuse	final series	blade	medial	1
C185B/16-1	constr. fill/refuse	flake fragment	-	-	1
C185B/25-1	constr. fill/refuse	final series	blade	distal	1
C185B/31-1b	constr. fill/refuse	fragment	-	-	1
C185B/31-1d	constr. fill/refuse	final series	blade	medial	1
C185B/31-1c	constr. fill/refuse	initial series	blade	medial	2
C185B/31-1a	constr. fill/refuse	indeterminate rejuv debitage	flake	-	1
C185B/43-1	constr. fill/refuse	initial series	blade	distal	1
C185B/44-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C185B/46-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185B/49-1	constr. fill/refuse	final series	blade	medial	1
C185B/51-1	constr. fill/refuse	fragment	-	-	1
C185B/53-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185B/53-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C185B/55-1	constr. fill/refuse	final series	blade	med/dist	1
C185B/57-9	SDC185B-13	final series	blade	complete	1
C185B/58-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185C/1-4	constr. fill/refuse	final series	edge-mod. tool	medial	2
C185C/1-5	constr. fill/refuse	final series	edge-mod. tool	medial	2
C185C/1-6	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C185C/2-3	constr. fill/refuse	final series	blade	medial	1
C185C/2-4	constr. fill/refuse	final series	blade	medial	1
C185C/2-5	constr. fill/refuse	final series	blade	prox/med	1
C185C/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185C/3-2	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C185C/3-3	constr. fill/refuse	fragment	-	-	1
C185C/4-12	SDC185C-1	final series	edge-mod. tool	medial	1
C185C/4-11b	SDC185C-1	final series	blade	medial	1
C185C/4-11c	SDC185C-1	final series	blade	med/dist	1
C185C/4-11a	SDC185C-1	final series	edge-mod. tool	medial	1
C185C/4-14	SDC185C-1	final series	edge-mod. tool	medial	1
C185C/4-4	SDC185C-1	final series	edge-mod. tool	medial	1
C185C/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C185C/7-2	constr. fill/refuse	final series	blade	medial	1
C185C/7-4	constr. fill/refuse	fragment	-	-	1
C185C/15-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/1-2b	constr. fill/refuse	final series	blade	med/dist	1
C185D/1-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C185D/1-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/2-1b	constr. fill/refuse	fragment	macro flake?	-	1
C185D/2-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/2-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/2-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C185D/2-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C185D/2-3b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C185D/2-4	constr. fill/refuse	fragment	notched	medial	1
C185D/4-1	constr. fill/refuse	final series	blade	complete	1
C185D/4-2	constr. fill/refuse	fragment	-	-	1
C185D/6-1	constr. fill/refuse	final series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C185D/6-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/6-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/7-4	constr. fill/refuse	blade-core frag (non-rejuv)	-	indeterminate	1
C185D/7-6b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/7-6a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C185D/10-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/13-1	constr. fill/refuse	final series	blade	medial	1
C185D/14-4a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/14-4b	constr. fill/refuse	final series	blade	medial	1
C185D/14-5	constr. fill/refuse	fragment	-	-	1
C185D/14-7	constr. fill/refuse	final series	edge-mod. tool	med/dist	2
C185D/16-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C185D/18-2	constr. fill/refuse	fragment	-	-	1
C185D/20-1	constr. fill/refuse	final series	blade	medial	1
C186B/4-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186B/4-2a	constr. fill/refuse	final series	drill	medial	1
C186B/10-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186B/10-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C185D/10-6	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186B/11-8	constr. fill/refuse	final series	blade	medial	1
C186B/11-5	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186B/13-1	constr. fill/refuse	final series	blade	medial	1
C186B/14-1	constr. fill/refuse	initial series	blade	medial	1
C186B/15-3	constr. fill/refuse	final series	blade	medial	2
C186B/16-8	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186B/17-3	constr. fill/refuse	final series	blade	prox/med	1
C186B/18-6a	SDC186B-3	final series	blade	proximal	1
C186B/18-6b	SDC186B-3	final series	blade	medial	1
C186B/18-9	SDC186B-3	shatter	-	-	1
C186B/21-11	SD, but not assigned	platform prep flake	-	-	1
C186B/23-15	constr. fill/refuse	final series	blade	medial	1
C186B/23-9	constr. fill/refuse	fragment	-	-	1
C186B/24-17a	SDC186B-4	final series	edge-mod. tool	medial	1
C186B/24-17b	SDC186B-4	final series	edge-mod. tool	med/dist	1
C186B/24-18	SDC186B-4	final series	edge-mod. tool	prox/med	2
C186B/24-19	SDC186B-4	final series	edge-mod. tool	prox/med	1
C186C/2-3	constr. fill/refuse	fragment	blade-core frag?	proximal	1
C186C/2-4	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186C/3-3	constr. fill/refuse	final series	blade	medial	1
C186C/4-2	constr. fill/refuse	fragment	-	-	1
C186C/5-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/7-2a	constr. fill/refuse	final series	blade	medial	1
C186C/7-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/8-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/8-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/9-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186C/9-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/10-13	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C186C/11-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186C/11-2b	constr. fill/refuse	final series	blade	medial	1
C186C/12-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/15-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186C/16-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186C/16-3	constr. fill/refuse	final series	edge-mod. tool	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C186C/19-2	constr. fill/refuse	final series	blade	medial	1
C186C/19-7	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/19-8	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C186C/29-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186C/32-15	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186C/32-5	constr. fill/refuse	platform prep flake	-	-	1
C186D/1-9	constr. fill/refuse	final series	blade	proximal	1
C186D/2-10d	constr. fill/refuse	fragment	-	-	2
C186D/2-10a	constr. fill/refuse	final series	blade	proximal	1
C186D/2-10b	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C186D/2-10c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C186D/2-11	constr. fill/refuse	shatter	-	-	2
C186D/3-11b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C186D/3-11a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C186D/4-11a	SDC186D-1	final series	edge-mod. tool	prox/med	1
C186D/4-11b	SDC186D-1	final series	edge-mod. tool	medial	1
C186D/4-29	SDC186D-1	fragment	-	-	1
C186D/4-30b	SDC186D-1	final series	blade	medial	1
C186D/4-30a	SDC186D-1	final series	edge-mod. tool	medial	1
C186D/5-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186D/5-3	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186D/6-14	constr. fill/refuse	final series	notched blade	prox/med	3
C186D/6-15	constr. fill/refuse	final series	blade	prox/med	1
C186D/6-16	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186D/6-5	constr. fill/refuse	fragment	pointed tool	distal	1
C186D/6-6	constr. fill/refuse	final series	edge-mod. tool	medial	3
C186D/7-8	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186D/8-20	SD, but not assigned	macroblade with cortex	core shaping	-	1
C186D/8-21b	SD, but not assigned	final series	edge-mod. tool	medial	1
C186D/8-21a	SD, but not assigned	final series	blade	medial	3
C186D/8-22	SD, but not assigned	fragment	platform prep?	-	3
C186D/8-23	SD, but not assigned	fragment	blade frags?	-	3
C186D/8-24	SD, but not assigned	final series	notched blade	medial	1
C186D/8-25	SD, but not assigned	final series	edge-mod. tool	prox/med	1
C186D/8-26b	SD, but not assigned	initial series	blade	prox/med	1
C186D/8-26a	SD, but not assigned	final series	edge-mod. tool	prox/med	3
C186D/8-5	SD, but not assigned	final series	edge-mod. tool	medial	1
C186D/9-12a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C186D/9-12b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C186D/9-25b	constr. fill/refuse	final series	blade	medial	1
C186D/9-25a	constr. fill/refuse	final series	blade	prox/med	1
C186D/9-25c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C186D/9-26	constr. fill/refuse	final series	blade	medial	1
C186D/10-6	SDC186D-2	fragment	-	-	2
C186C/1-3	constr. fill/refuse	final series	blade	medial	1
C188A/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188B/2-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188B/6-1	constr. fill/refuse	final series	edge-mod. tool	complete	1
C188B/8-1	constr. fill/refuse	final series	blade	medial	1
C188B/18-1	SDC188B-1	object from blade core frag	notched	distal/medial	1
C188B/18-2	SDC188B-1	blade-core frag (non-rejuv)	-	distal/medial	1
C188B/23-2	SDC188B-4	final series	blade	complete	1
C188B/29-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188B/29-1a	constr. fill/refuse	final series	blade	prox/med	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C188B/33-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C188B/37-37	SDC188B-8	platform prep flake	inlay	-	1
C188C/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C188C/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188C/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188C/19-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C188C/19-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C188C/30-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C188C/30-1a	constr. fill/refuse	final series	blade	proximal	1
C188C/30-1c	constr. fill/refuse	final series	edge-mod. tool	medial	4
C188C/31-1	constr. fill/refuse	final series	blade	medial	1
C188B/36-1a	constr. fill/refuse	final series	blade	prox/med	1
C188B/36-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188D/3-1	constr. fill/refuse	final series	blade	medial	1
C188D/5-1	constr. fill/refuse	fragment	-	-	1
C188D/10-1	constr. fill/refuse	final series	blade	medial	1
C188D/19-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188D/19-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C188E/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C188E/4-1b	constr. fill/refuse	fragment	-	-	1
C188E/4-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188F/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188F/4-1	constr. fill/refuse	final series	blade	med/dist	1
C188F/12-1	constr. fill/refuse	final series	blade	distal	1
C188F/13-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C188F/16-1b	constr. fill/refuse	fragment	-	-	1
C188F/16-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189B/2-12	SD, but not assigned	macroflake with cortex	core shaping	-	1
C189B/3-1	SDC189B-1	objects from exhausted core	notched	complete	1
C189B/3-2	SDC189B-1	object from blade core frag	notched	lateral	1
C189B/3-3	SDC189B-1	objects from exhausted core	notched	complete	1
C189B/3-4	SDC189B-1	faceted core-top fragment	edge-mod. tool	-	1
C189B/3-5	SDC189B-1	fragment	edge-mod	-	1
C189B/4-2	SDC189B-1	macroflake	core shaping	-	1
C189B/5-1	SD, but not assigned	object from blade core frag	notched	proximal/medial/lateral	1
C189B/6-1	constr. fill/refuse	final series	blade	med/dist	1
C189B/7-2	SDC189B-1	macroflake	core shaping	-	1
C189B/8-1	constr. fill/refuse	final series	blade	med/dist	1
C189B/14-1	SDC189B-4	macroflake with cortex	core shaping	-	1
C189B/14-2	SDC189B-4	macroflake	core shaping	-	1
C189B/14-3	SDC189B-4	macroflake	core shaping	-	1
C189B/15-2	SD, but not assigned	final series	edge-mod. tool	prox/med	1
C189B/17-8	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189B/20-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189B/23-1	SDC189B-6	macroflake	notched	-	1
C189B/23-10	SDC189B-6	object from blade core frag	notched	distal	1
C189B/23-11	SDC189B-6	object from blade core frag	uniface	proximal/medial/lateral	1
C189B/23-2	SDC189B-6	blade-core frag (non-rejuv)	-	proximal/medial	1
C189B/23-3	SDC189B-6	final series	notched blade	complete	1
C189B/23-4	SDC189B-6	blade-core frag (non-rejuv)	-	medial	1
C189B/23-5	SDC189B-6	exhausted core	-	complete	1
C189B/23-6	SDC189B-6	blade-core frag (non-rejuv)	-	medial	1
C189B/23-7	SDC189B-6	macroflake	notched	-	1
C189B/23-8	SDC189B-6	blade-core frag (non-rejuv)	-	medial/distal/lateral	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C189B/23-9	SDC189B-6	object from blade core frag	notched	medial	1
C189B/24-66	SDC189B-7	macroflake	edge-mod. tool	-	1
C189B/24-67f	SDC189B-7	final series	edge-mod. tool	prox/med	2
C189B/24-67g	SDC189B-7	final series	edge-mod. tool	medial	4
C189B/24-67c	SDC189B-7	final series	edge-mod. tool	complete	1
C189B/24-67a	SDC189B-7	final series	edge-mod. tool	complete	1
C189B/24-67b	SDC189B-7	final series	edge-mod. tool	complete	1
C189B/24-67d	SDC189B-7	final series	blade	complete	1
C189B/24-67h	SDC189B-7	final series	blade	medial	1
C189B/24-67i	SDC189B-7	final series	blade	distal	2
C189B/24-67e	SDC189B-7	final series	blade	prox/med	4
C189B/26-10	SDC189B-9	blade-core frag (non-rejuv)	-	medial	1
C189B/26-11	SDC189B-9	macroblade	core shaping	-	1
C189B/26-13	SDC189B-9	final series	blade	complete	2
C189B/26-14	SDC189B-9	macroflake with cortex	core shaping	-	1
C189B/26-8	SDC189B-9	macroflake	core shaping	-	1
C189B/26-9	SDC189B-9	initial series	notched blade	complete	1
C189B/26-12a	SDC189B-9	final series	edge-mod. tool	prox/med	1
C189B/26-12c	SDC189B-9	final series	blade	med/dist	1
C189B/26-12b	SDC189B-9	final series	edge-mod. tool	medial	3
C189B/31-3	constr. fill/refuse	final series	blade	medial	1
C189B/32-3	constr. fill/refuse	fragment	-	-	1
C189B/33-1	SDC189B-13	objects from exhausted core	notched	complete	1
C189B/33-2	SDC189B-13	final series	other	plunging complete	1
C189B/33-3	SDC189B-13	final series	other	plunging complete	1
C189B/34-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189B/37-4a	constr. fill/refuse	final series	blade	proximal	1
C189B/37-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189C/2-16	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189C/4-5	constr. fill/refuse	final series	blade	prox/med	1
C189C/6-14	constr. fill/refuse	final series	edge-mod. tool	medial	2
C189C/7-14	constr. fill/refuse	final series	edge-mod. tool	medial	2
C189C/12-4b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189C/12-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C189C/13-9	constr. fill/refuse	final series	blade	medial	2
C189C/18-5	constr. fill/refuse	final series	edge-mod. tool	prox/med	4
C189C/19-4a	constr. fill/refuse	final series	notched blade	prox/med	1
C189C/19-4b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C189C/20-4	constr. fill/refuse	final series	blade	medial	2
C189D/1-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C189D/1-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189D/2-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C189D/2-2b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C189D/2-2c	constr. fill/refuse	platform prep flake	edge-mod. tool	-	2
C189D/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189D/3-1a	constr. fill/refuse	initial series	edge-mod. tool	prox/med	1
C189D/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189D/10-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C189D/10-3b	constr. fill/refuse	final series	blade	medial	2
C189D/11-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C189D/15-4	constr. fill/refuse	final series	blade	medial	1
C190B/7-2	constr. fill/refuse	final series	blade	medial	1
C190B/14-6b	constr. fill/refuse	final series	blade	prox/med	1
C190B/14-6a	constr. fill/refuse	final series	blade	prox/med	1

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C190B/17-11c	constr. fill/refuse	flake	-	complete	1
C190B/17-11a	constr. fill/refuse	final series	blade	med/dist	1
C190B/17-11b	constr. fill/refuse	final series	blade	prox/med	1
C190D/3-5	constr. fill/refuse	final series	blade	medial	1
C190D/2-9a	constr. fill/refuse	final series	blade	prox/med	1
C190D/2-9b	constr. fill/refuse	final series	blade	prox/med	1
C190D/5-1	constr. fill/refuse	final series	blade	med/dist	1
C191B/1-1a	constr. fill/refuse	final series	blade	prox/med	1
C191B/3-1b	constr. fill/refuse	final series	blade	prox/med	1
C191B/3-1a	constr. fill/refuse	final series	blade	prox/med	1
C191B/3-1c	constr. fill/refuse	final series	blade	proximal	1
C191B/3-4a	constr. fill/refuse	blade-core frag (non-rejuv)	core section	medial/lateral	1
C191B/3-1g	constr. fill/refuse	final series	blade	medial	1
C191B/3-1f	constr. fill/refuse	final series	blade	med/dist	1
C191B/3-1d	constr. fill/refuse	final series	blade	medial	1
C191B/3-1e	constr. fill/refuse	final series	blade	medial	1
C191B/3-2a	constr. fill/refuse	final series	blade	medial	1
C191B/3-3a	constr. fill/refuse	final series	blade	medial	1
C191B/4-1a	constr. fill/refuse	final series	blade	medial	1
C191B/6-1a	constr. fill/refuse	final series	blade	medial	2
C191B/9-1a	constr. fill/refuse	final series	blade	med/dist	1
C191B/10-1a	constr. fill/refuse	final series	blade	prox/med	1
C191B/10-1b	constr. fill/refuse	final series	blade	distal	1
C191B/11-2a	constr. fill/refuse	final series	blade	prox/med	1
C191B/11-2b	constr. fill/refuse	final series	blade	medial	1
C191B/11-2c	constr. fill/refuse	macroflake	core shaping	-	1
C191C/1-1a	constr. fill/refuse	final series	blade	prox/med	1
C191C/1-1b	constr. fill/refuse	final series	blade	medial	1
C191C/2-1a	constr. fill/refuse	final series	blade	medial	1
C191C/3-1b	constr. fill/refuse	final series	blade	medial	1
C191C/3-1a	constr. fill/refuse	final series	blade	proximal	1
C191C/3-1d	constr. fill/refuse	final series	blade	medial	2
C191C/3-1c	constr. fill/refuse	core section flake	-	-	1
C191C/4-1a	constr. fill/refuse	final series	blade	prox/med	1
C191C/4-1g	constr. fill/refuse	final series	blade	medial	1
C191C/4-1b	constr. fill/refuse	final series	blade	prox/med	1
C191C/4-1c	constr. fill/refuse	final series	blade	med/dist	1
C191C/4-1d	constr. fill/refuse	final series	blade	medial	1
C191C/4-1f	constr. fill/refuse	final series	blade	proximal	1
C191C/4-1e	constr. fill/refuse	final series	blade	medial	2
C191C/4-2a	constr. fill/refuse	final series	blade	proximal	1
C191C/5-1d	constr. fill/refuse	final series	blade	distal	1
C191C/5-1b	constr. fill/refuse	final series	blade	medial	1
C191C/5-1c	constr. fill/refuse	final series	blade	medial	1
C191C/5-1a	constr. fill/refuse	final series	blade	medial	1
C191C/6-1a	constr. fill/refuse	final series	blade	prox/med	1
C191C/9-1a	constr. fill/refuse	final series	blade	medial	1
C191D/1-1a	constr. fill/refuse	final series	blade	prox/med	1
C191D/1-1b	constr. fill/refuse	final series	blade	medial	1
C191D/3-2a	constr. fill/refuse	final series	blade	medial	2
C191D/3-1c	constr. fill/refuse	final series	blade	medial	1
C191D/3-1b	constr. fill/refuse	final series	blade	medial	1
C191D/3-1d	constr. fill/refuse	final series	blade	medial	1
C191D/3-1a	constr. fill/refuse	final series	blade	prox/med	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C191D/4-1b	constr. fill/refuse	final series	blade	medial	1
C191D/4-1a	constr. fill/refuse	final series	blade	med/dist	1
C191E/1-1	constr. fill/refuse	final series	blade	medial	1
C191E/3-1a	constr. fill/refuse	final series	blade	distal	1
C191E/3-1b	constr. fill/refuse	final series	blade	proximal	1
C191E/3-1c	constr. fill/refuse	final series	blade	proximal	1
C191E/6-1	constr. fill/refuse	final series	blade	medial	1
C192B/1-2a	constr. fill/refuse	objects from exhausted core	lip plug	medial	1
C192B/1-1a	constr. fill/refuse	final series	blade	distal	1
C192B/1-1b	constr. fill/refuse	final series	blade	proximal	1
C192B/2-1a	constr. fill/refuse	final series	blade	med/dist	1
C192B/2-1c	constr. fill/refuse	final series	blade	medial	1
C192B/2-1d	constr. fill/refuse	final series	blade	medial	1
C192B/2-1e	constr. fill/refuse	final series	blade	medial	1
C192B/2-1b	constr. fill/refuse	final series	blade	med/dist	2
C192B/3-9a	constr. fill/refuse	final series	blade	medial	1
C192B/4-2a	constr. fill/refuse	final series	blade	medial	1
C192B/5-1a	constr. fill/refuse	final series	blade	medial	1
C192B/5-1b	constr. fill/refuse	final series	blade	proximal	1
C192C/1-1b	constr. fill/refuse	final series	blade	prox/med	1
C192C/1-1c	constr. fill/refuse	final series	blade	medial	1
C192C/1-1a	constr. fill/refuse	final series	blade	medial	1
C192C/2-1a	constr. fill/refuse	final series	blade	medial	1
C192C/2-1b	constr. fill/refuse	final series	blade	medial	1
C192C/5-1a	constr. fill/refuse	final series	blade	prox/med	1
C192C/5-1b	constr. fill/refuse	final series	blade	prox/med	1
C192C/6-1a	constr. fill/refuse	final series	blade	distal	1
C193B/4-7a	constr. fill/refuse	final series	blade	medial	1
C193B/4-7b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193B/7-2	constr. fill/refuse	scraper	-	distal	1
C193B/7-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193B/22-72e	SDC193B-2	final series	edge-mod. tool	prox/med	3
C193B/22-72g	SDC193B-2	fragment	-	-	2
C193B/22-72f	SDC193B-2	final series	blade	distal	1
C193B/22-72b	SDC193B-2	final series	blade	proximal	1
C193B/22-72a	SDC193B-2	initial series	blade	prox/med	1
C193B/22-72d	SDC193B-2	final series	blade	medial	2
C193B/22-72c	SDC193B-2	final series	blade	prox/med	3
C193B/26-18c	SDC193B-3	flake	-	complete	1
C193B/26-18a	SDC193B-3	final series	edge-mod. tool	prox/med	1
C193B/26-18b	SDC193B-3	final series	edge-mod. tool	medial	1
C193C/1-7	constr. fill/refuse	flake	biface fragment?	proximal	1
C193C/1-8a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193C/1-8b	constr. fill/refuse	final series	edge-mod. tool	medial	6
C193C/2-5	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193C/3-16e	constr. fill/refuse	final series	blade	medial	1
C193C/3-16b	constr. fill/refuse	final series	blade	prox/med	2
C193C/3-16c	constr. fill/refuse	initial series	blade	medial	3
C193C/3-16a	constr. fill/refuse	final series	edge-mod. tool	prox/med	4
C193C/3-16d	constr. fill/refuse	final series	edge-mod. tool	medial	10
C193C/5-18c	constr. fill/refuse	fragment	-	-	1
C193C/5-18b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C193C/5-18a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C193C/7-12	constr. fill/refuse	final series	edge-mod. tool	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C193C/8-4	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C193C/10-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193C/11-7b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193C/11-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193C/12-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193D/1-8	constr. fill/refuse	flake	-	-	1
C193D/3-5	constr. fill/refuse	final series	blade	prox/med	1
C193D/4-8a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193D/4-8b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C193D/5-9a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193D/5-9b	constr. fill/refuse	final series	edge-mod. tool	medial	6
C193D/6-7	constr. fill/refuse	final series	blade	medial	1
C193D/8-10a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193D/8-10b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C193E/1-6	constr. fill/refuse	final series	blade	medial	1
C193E/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	4
C193E/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193E/8-7	constr. fill/refuse	flake	-	-	1
C193E/10-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193E/11-6	constr. fill/refuse	final series	blade	prox/med	1
C193F/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193F/2-11a	constr. fill/refuse	final series	blade	prox/med	1
C193F/2-11b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193F/2-11c	constr. fill/refuse	final series	blade	distal	1
C193F/3-3	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C193F/4-1a	constr. fill/refuse	final series	blade	medial	1
C193F/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C193F/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193F/5-2	constr. fill/refuse	final series	blade	medial	2
C193G/1-3a	constr. fill/refuse	final series	blade	proximal	1
C193G/1-3d	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C193G/1-3c	constr. fill/refuse	final series	blade	medial	1
C193G/1-3b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C193G/2-1a	constr. fill/refuse	initial series	blade	complete	1
C193G/2-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193G/2-1c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C193G/3-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193G/3-3b	constr. fill/refuse	final series	blade	medial	2
C193G/4-1	constr. fill/refuse	final series	drill	medial	1
C193G/4-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193G/4-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193G/4-2e	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C193G/4-2c	constr. fill/refuse	final series	blade	medial	1
C193G/4-2d	constr. fill/refuse	final series	edge-mod. tool	medial	3
C193G/5-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193G/5-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C193G/6-1a	constr. fill/refuse	final series	blade	prox/med	1
C193G/6-1c	constr. fill/refuse	final series	blade	medial	1
C193G/6-1b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193G/7-4a	constr. fill/refuse	final series	blade	proximal	1
C193G/7-4b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C193G/7-4c	constr. fill/refuse	final series	blade	medial	5
C193G/8-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C193G/8-1c	constr. fill/refuse	initial series	blade	medial	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C193G/8-1b	constr. fill/refuse	final series	blade	medial	2
C193G/8-2	constr. fill/refuse	indeterminate rejuv debitage	edge-mod. tool	-	2
C193H/1-2	constr. fill/refuse	bidirectional core	-	complete	1
C193H/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	3
C193H/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C193H/2-1a	constr. fill/refuse	final series	blade	medial	2
C193H/3-1a	constr. fill/refuse	final series	blade	medial	3
C193H/3-1b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C193H/4-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C193H/4-1c	constr. fill/refuse	final series	blade	medial	1
C193H/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	9
C194B/1-7	constr. fill/refuse	final series	blade	medial	2
C194B/4-8	constr. fill/refuse	final series	edge-mod. tool	medial	1
C194B/8-2	constr. fill/refuse	final series	blade	medial	1
C194B/11-4	constr. fill/refuse	final series	blade	medial	1
C194B/13-5	constr. fill/refuse	final series	blade	medial	1
C194B/14-9	constr. fill/refuse	fragment	-	-	1
C194B/17-7	constr. fill/refuse	final series	blade	medial	2
C194B/18-24	SDC194B-2	flake	blade-core frag?	-	1
C194B/23-7b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C194B/23-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C194B/25-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C194B/26-31e	SDC194B-5	final series	edge-mod. tool	complete	1
C194B/26-31g	SDC194B-5	final series	blade	complete	1
C194B/26-31d	SDC194B-5	final series	blade	prox/med	1
C194B/26-31j	SDC194B-5	final series	blade	medial	1
C194B/26-31f	SDC194B-5	final series	blade	complete	1
C194B/26-31c	SDC194B-5	final series	lancet	med/dist	1
C194B/26-31b	SDC194B-5	final series	edge-mod. tool	med/dist	1
C194B/26-31a	SDC194B-5	final series	lancet	complete	1
C194B/26-31h	SDC194B-5	final series	blade	prox/med	1
C194B/26-31i	SDC194B-5	final series	edge-mod. tool	complete	1
C194C/1-8b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C194C/1-8a	constr. fill/refuse	final series	notched blade	medial	1
C194C/1-9	constr. fill/refuse	blade-core frag (non-rejuv)	-	medial/lateral	1
C194C/4-12b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C194C/4-12a	constr. fill/refuse	final series	blade	prox/med	1
C194C/4-12c	constr. fill/refuse	final series	edge-mod. tool	medial	6
C194C/5-7b	constr. fill/refuse	fragment	-	-	1
C194C/5-7a	constr. fill/refuse	final series	blade	med/dist	1
C194C/6-6	constr. fill/refuse	final series	blade	medial	1
C194C/7-6a	constr. fill/refuse	final series	blade	proximal	1
C194C/7-6b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C194C/7-6c	constr. fill/refuse	final series	blade	medial	3
C194C/8-5c	constr. fill/refuse	fragment	-	-	1
C194C/8-5a	constr. fill/refuse	final series	blade	medial	1
C194C/8-5b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C194C/9-1	constr. fill/refuse	final series	blade	medial	1
C194C/14-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C194C/14-4	constr. fill/refuse	macroflake	core shaping	-	1
C194C/16-5d	constr. fill/refuse	flake	-	medial	1
C194C/16-5a	constr. fill/refuse	final series	blade	prox/med	1
C194C/16-5b	constr. fill/refuse	final series	blade	med/dist	1
C194C/16-5c	constr. fill/refuse	platform prep flake	-	-	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C194D/2-1b	constr. fill/refuse	flake	-	-	1
C194D/2-1c	constr. fill/refuse	fragment	-	-	1
C194D/2-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C194D/3-7	constr. fill/refuse	striated core-top fragment	-	-	1
C194D/3-8d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C194D/3-8a	constr. fill/refuse	final series	blade	proximal	1
C194D/3-8c	constr. fill/refuse	final series	blade	medial	2
C194D/3-8b	constr. fill/refuse	final series	edge-mod. tool	medial	7
C194D/4-1c	constr. fill/refuse	final series	blade	medial	1
C194D/4-1a	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C194D/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C194D/4-2	constr. fill/refuse	final series	drill	med/dist	1
C194D/6-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C195B/5-2	constr. fill/refuse	final series	edge-mod. tool	complete	1
C195B/7-3	SDC195B-4	final series	blade	complete	1
C195B/8-3	constr. fill/refuse	final series	edge-mod. tool	medial	2
C195B/9-4	SDC195B-5	final series	blade	complete	1
C195C/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C195C/2-6	constr. fill/refuse	final series	edge-mod. tool	medial	1
C195C/2-7a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C195C/2-7c	constr. fill/refuse	final series	blade	distal	1
C195C/2-7b	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C195C/3-8	constr. fill/refuse	indeterminate core-top fragment	inlay	-	1
C195C/4-10b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C195C/4-10a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C195C/5-6b	constr. fill/refuse	fragment	-	-	1
C195C/5-6a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C195D/2-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C195D/4-7c	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C195D/4-7d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C195D/4-7a	constr. fill/refuse	final series	edge-mod. tool	prox/med	3
C195D/4-7b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C196B/8-3	SDC196B-1	initial series	blade	medial	2
C196C/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C196C/3-2	constr. fill/refuse	final series	blade	medial	1
C196C/4-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C196D/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C196E/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	4
C196E/2-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C196E/2-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C196E/2-2b	constr. fill/refuse	indeterminate rejuv debitage	edge-mod. tool	-	3
C196E/4-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C196E/5-4	constr. fill/refuse	final series	edge-mod. tool	medial	4
C197B/1-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C197B/1-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C197B/1-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C197B/2-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C197B/3-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C197C/1-2a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C197C/1-2b	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C197C/2-2	constr. fill/refuse	final series	edge-mod. tool	medial	2
C197C/3-3a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C197C/3-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2

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C197C/6-2	constr. fill/refuse	final series	blade	medial	3
C197C/7-4a	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C197C/7-4b	constr. fill/refuse	final series	edge-mod. tool	medial	4
C197D/5-2	constr. fill/refuse	final series	blade	medial	1
C198B/1-11	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C198B/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C198B/10-1	SDC198B-4	final series	edge-mod. tool	medial	1
C198B/12-11	constr. fill/refuse	flake	-	-	1
C198C/1-8a	constr. fill/refuse	final series	blade	medial	1
C198C/1-8a	constr. fill/refuse	fragment	-	-	2
C199B/15-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C199B/15-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199B/6-1	constr. fill/refuse	final series	blade	medial	1
C199B/6-2	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C199B/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199B/13-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199B/14-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199B/16-1	SDC199B-2	final series	edge-mod. tool	medial	2
C199B/17-1	constr. fill/refuse	final series	blade	medial	1
C199B/17-2	constr. fill/refuse	final series	blade	medial	1
C199B/18-12b	SDC199B-3	final series	edge-mod. tool	proximal	1
C199B/18-12a	SDC199B-3	final series	edge-mod. tool	medial	2
C199B/18-13	SDC199B-18	blade-core frag (non-rejuv)	-	distal & lateral	1
C199B/19-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C199B/19-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199B/19-3	constr. fill/refuse	final series	blade	distal	1
C199B/19-4	constr. fill/refuse	final series	blade	med/dist	1
C199B/19-5	constr. fill/refuse	macroblade	edge-mod-retouch	-	1
C199C/1-1	constr. fill/refuse	final series	blade	medial	1
C199C/2-1	constr. fill/refuse	final series	edge-mod. tool	distal	2
C199C/3-1	constr. fill/refuse	final series	blade	prox/med	1
C199C/3-2	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C199C/4-1	constr. fill/refuse	final series	blade	medial	1
C199C/7-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C199C/8-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C199C/8-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199D/3-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C199D/3-2	constr. fill/refuse	final series	blade	distal	1
C199D/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	4
C199D/5-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C199D/5-2	constr. fill/refuse	blade-core frag (non-rejuv)		lateral	2
C199D/6-1	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C199D/6-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199D/8-1	constr. fill/refuse	final series	blade	prox/med	1
C199D/8-2	constr. fill/refuse	fragment	-	-	1
C199D/10-1	constr. fill/refuse	final series	blade	medial	2
C199E/1-1	constr. fill/refuse	final series	blade	medial	1
C199E/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199E/5-1	constr. fill/refuse	final series	blade	medial	1
C199E/6-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C199E/7-1	constr. fill/refuse	pecked ground core-top fragment	scraper, notched, hafted	-	1
C199E/7-2	constr. fill/refuse	shatter	-	-	2
C199E/7-3	constr. fill/refuse	final series	edge-mod. tool	proximal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C199E/7-4	constr. fill/refuse	final series	blade	medial	1
C199E/7-5	constr. fill/refuse	final series	edge-mod. tool	medial	3
C199E/8-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199E/9-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C199E/9-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199E/10-1	constr. fill/refuse	fragment	blade-core frag?	-	1
C199E/10-2	constr. fill/refuse	fragment	-	-	2
C199E/12-1	constr. fill/refuse	fragment	-	-	1
C199E/12-2	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C199E/12-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199E/12-4	constr. fill/refuse	final series	edge-mod. tool	medial	1
C199E/12-5	constr. fill/refuse	final series	blade	distal	1
C200B/1-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C200B/3-3	constr. fill/refuse	final series	edge-mod. tool	med/dist	1
C200B/6-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200B/8-1a	SDC200B-2	final series	blade	proximal	1
C200B/8-1b	SDC200B-2	final series	edge-mod. tool	medial	1
C200B/9-1	constr. fill/refuse	error-correction	fragment	-	1
C200B/10-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C200C/5-2	constr. fill/refuse	final series	blade	proximal	1
C200C/5-3	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C200C/6-3	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200C/6-4	constr. fill/refuse	final series	blade	medial	1
C200C/7-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200C/7-1d	constr. fill/refuse	final series	blade	distal	1
C200C/7-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200C/7-1a	constr. fill/refuse	final series	blade	proximal	1
C200C/8-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C200C/9-4a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200C/9-4c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200C/9-4b	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C200C/10-2	constr. fill/refuse	final series	blade	medial	1
C200D/4-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200D/6-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C200D/6-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C200D/7-1	constr. fill/refuse	final series	edge-mod. tool	medial	2
C200D/8-3c	constr. fill/refuse	final series	blade	proximal	1
C200D/8-3d	constr. fill/refuse	final series	blade	distal	1
C200D/8-3a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C200D/8-3b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C200D/8-4	constr. fill/refuse	objects from exhausted core		distal, lateral?	1
C200D/8-5	constr. fill/refuse	initial series	blade	medial	2
C201B/5-1a	constr. fill/refuse	fragment	edge-mod	-	1
C201B/5-1b	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C201B/5-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C201B/7-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C201B/7-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C201B/15-1	constr. fill/refuse	final series	blade	proximal	1
C201B/18-1	constr. fill/refuse	final series	blade	medial	1
C201B/21-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C201B/21-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C201B/21-3	constr. fill/refuse	macroflake with cortex	core shaping	-	1
C201B/22-2	SDC201B-3	final series	edge-mod. tool	proximal	1
C201B/26-34c	SDC201B-6	final series	edge-mod. tool	prox/med	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C201B/26-34g	SDC201B-6	final series	blade	complete	1
C201B/26-34e	SDC201B-6	final series	edge-mod. tool	proximal	1
C201B/26-34f	SDC201B-6	final series	edge-mod. tool	distal	1
C201B/26-34h	SDC201B-6	final series	blade	medial	1
C201B/26-34d	SDC201B-6	final series	edge-mod. tool	prox/med	2
C201B/26-34b	SDC201B-6	final series	blade	prox/med	2
C201B/26-34a	SDC201B-6	final series	edge-mod. tool	medial	3
C201C/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C201C/3-1	constr. fill/refuse	final series	blade	medial	1
C201C/4-2	constr. fill/refuse	distal orientation flake	notched, fragment	-	1
C201C/4-3b	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C201C/4-3a	constr. fill/refuse	final series	edge-mod. tool	medial	11
C201C/5-2d	constr. fill/refuse	final series	edge-mod. tool	distal	1
C201C/5-2b	constr. fill/refuse	initial series	edge-mod. tool	medial	1
C201C/5-2a	constr. fill/refuse	initial series	blade	proximal & medial	2
C201C/5-2c	constr. fill/refuse	final series	edge-mod. tool	medial	2
C201C/6-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C201D/4-1	constr. fill/refuse	final series	blade	distal	1
C201D/7-3b	constr. fill/refuse	final series	blade	distal	1
C201D/7-3a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C201D/7-4	constr. fill/refuse	shatter	-	-	1
C201D/8-1	constr. fill/refuse	final series	blade	proximal	2
C201D/9-3b	constr. fill/refuse	initial series	blade	complete	1
C201D/9-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C201D/9-3c	constr. fill/refuse	final series	blade	proximal	1
C201D/9-3d	constr. fill/refuse	final series	edge-mod. tool	medial	2
C201D/10-3a	constr. fill/refuse	final series	blade	medial	1
C201D/10-3c	constr. fill/refuse	final series	edge-mod. tool	proximal	4
C201D/10-3b	constr. fill/refuse	final series	edge-mod. tool	medial	5
C201E/2-2	constr. fill/refuse	initial series	blade	medial	1
C201E/2-3	constr. fill/refuse	objects from exhausted core	-	lateral	1
C202B/1-1	constr. fill/refuse	final series	blade	medial	1
C202B/3-1	constr. fill/refuse	initial series	edge-mod. tool	medial	1
C202B/4-1d	constr. fill/refuse	final series	blade	plunging distal	1
C202B/4-1c	constr. fill/refuse	final series	blade	plunging distal	1
C202B/4-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C202B/4-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C202B/5-1	constr. fill/refuse	final series	blade	distal	1
C202B/6-1	constr. fill/refuse	objects from exhausted core	edge-mod. tool	medial/lateral	1
C203B/1-2	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/2-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C203B/2-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/7-6a	constr. fill/refuse	final series	edge-mod. tool	complete	1
C203B/7-6c	constr. fill/refuse	final series	edge-mod. tool	distal	2
C203B/7-6b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C203B/8-2a	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C203B/8-2b	constr. fill/refuse	final series	edge-mod. tool	medial	2
C203B/10-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C203B/11-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/11-1b	constr. fill/refuse	final series	blade	medial	1
C203B/11-1c	constr. fill/refuse	final series	edge-mod. tool	plunging distal	1
C203B/13-3	constr. fill/refuse	final series	blade	medial	2
C203B/14-1	constr. fill/refuse	final series	blade	medial	1
C203B/15-1a	constr. fill/refuse	final series	edge-mod. tool	proximal	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C203B/15-1c	constr. fill/refuse	final series	blade	medial	1
C203B/15-1b	constr. fill/refuse	final series	edge-mod. tool	medial	3
C203B/16-2a	SDC203B-2	final series	edge-mod. tool	proximal	1
C203B/16-2b	SDC203B-2	final series	blade	distal	1
C203B/17-3a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/17-3b	constr. fill/refuse	final series	blade	medial	2
C203B/20-2b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/20-2a	constr. fill/refuse	final series	edge-mod. tool	medial	4
C203B/21-7	constr. fill/refuse	final series	blade	proximal	1
C203B/25-1c	constr. fill/refuse	final series	blade	medial	1
C203B/25-1a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/25-1f	constr. fill/refuse	final series	edge-mod. tool	plunging overshot	1
C203B/25-1b	constr. fill/refuse	final series	blade	proximal	1
C203B/25-1d	constr. fill/refuse	final series	edge-mod. tool	prox/med	2
C203B/25-1e	constr. fill/refuse	final series	edge-mod. tool	medial	7
C203B/25-2	constr. fill/refuse	fragment	-	-	2
C203B/26-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C203B/27-28e	SDC203B-9	initial series	overhang removal	proximal	4
C203B/27-28d	SDC203B-9	initial series	blade	complete and fragments	7
C203B/27-28c	SDC203B-9	final series	blade	medial	1
C203B/27-28b	SDC203B-9	final series	lancet	distal	1
C203B/27-28h	SDC203B-9	final series	edge-mod. tool	prox/med	1
C203B/27-28i	SDC203B-9	final series	blade	proximal	2
C203B/27-28a	SDC203B-9	final series	lancet	complete	3
C203B/27-28f	SDC203B-9	final series	blade	medial	5
C203B/27-28g	SDC203B-9	final series	blade	plunging distal	7
C203B/27-29	SDC203B-9	objects from exhausted core	-	medial/lateral	1
C203B/27-30	SDC203B-9	macroflake	core shaping	-	1
C203B/28-1a	constr. fill/refuse	final series	blade	distal	1
C203B/28-1b	constr. fill/refuse	final series	blade	proximal	1
C203B/29-15a	SDC203B-10	final series	edge-mod. tool	proximal	1
C203B/29-15c	SDC203B-10	final series	edge-mod. tool	medial	1
C203B/29-15b	SDC203B-10	final series	edge-mod. tool	medial	1
C203B/30-2	constr. fill/refuse	final series	blade	medial	1
C203B/31-11b	SDC203B-11	initial series	edge-mod. tool	medial	1
C203B/31-11a	SDC203B-11	final series	blade	medial	3
C203B/32-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/33-10a	SDC203B-12	final series	edge-mod. tool	prox/med	1
C203B/33-10b	SDC203B-12	final series	overhang removal	proximal	1
C203B/33-9	SDC203B-12	shatter	-	-	1
C203B/36-29	SDC203B-14	fragment	-	-	1
C203B/36-30b	SDC203B-14	final series	blade	complete	1
C203B/36-30c	SDC203B-14	final series	edge-mod. tool	prox/med	1
C203B/36-30e	SDC203B-14	final series	blade	medial	1
C203B/36-30d	SDC203B-14	final series	edge-mod. tool	complete	1
C203B/36-30a	SDC203B-14	final series	lancet	complete	3
C203B/41-1b	constr. fill/refuse	final series	edge-mod. tool	complete	1
C203B/41-1c	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/41-1a	constr. fill/refuse	final series	blade	plunging distal	1
C203B/42-28e	SDC203B-16	final series	lancet	prox/med	1
C203B/42-28f	SDC203B-16	final series	bidirectional	medial	1
C203B/42-28d	SDC203B-16	final series	edge-mod. tool	medial	1
C203B/42-28c	SDC203B-16	final series	edge-mod. tool	prox/med	1
C203B/42-28a	SDC203B-16	final series	drill	complete	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C203B/42-28g	SDC203B-16	final series	blade	distal	1
C203B/42-28b	SDC203B-16	final series	blade	medial	2
C203B/42-29	SDC203B-16	objects from exhausted core	eccentric	medial	1
C203B/44-2a	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203B/44-2b	constr. fill/refuse	final series	edge-mod. tool	proximal	2
C203B/47-3	SDC203B-19	final series	edge-mod. tool	plunging distal	1
C203B/48-32a	SDC203B-20	final series	edge-mod. tool	prox/med	1
C203B/48-32e	SDC203B-20	final series	edge-mod. tool	complete	1
C203B/48-32d	SDC203B-20	final series	edge-mod. tool	proximal	1
C203B/48-32c	SDC203B-20	final series	edge-mod. tool	prox/med	1
C203B/48-32f	SDC203B-20	final series	blade	complete	1
C203B/48-32b	SDC203B-20	final series	edge-mod. tool	medial	2
C203C/4-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C203C/11-1b	constr. fill/refuse	final series	edge-mod. tool	medial	1
C203C/11-1a	constr. fill/refuse	final series	edge-mod. tool	medial	2
C203C/15-1	constr. fill/refuse	final series	edge-mod. tool	proximal	1
C204B/5-1	constr. fill/refuse	final series	edge-mod. tool	medial	1
C204B/8-4c	SDC204B-1	macroblade	core shaping	-	1
C204B/8-4a	SDC204B-1	macroflake	core shaping	-	1
C204B/8-4b	SDC204B-1	macroflake	edge-mod lateral	-	1
C204B/8-4d	SDC204B-1	macroflake	core shaping	-	1
C204B/8-5	SDC204B-1	fragment	-	-	1
C204B/9-1	constr. fill/refuse	fragment	-	-	1
C204B/10-1	constr. fill/refuse	fragment	-	-	1
C204B/13-1	constr. fill/refuse	objects from exhausted core	-	medial/lateral	1
C204B/13-2	constr. fill/refuse	macroblade	core shaping	-	1
C204B/13-3	constr. fill/refuse	final series	blade	proximal	1
C204B/15-1	constr. fill/refuse	final series	edge-mod. tool	prox/med	1
C204B/16-14a	SDC204B-4	final series	blade	proximal	1
C204B/16-14c	SDC204B-4	final series	edge-mod. tool	medial	2
C204B/16-14d	SDC204B-4	final series	edge-mod. tool	distal	2
C204B/16-14b	SDC204B-4	final series	blade	medial	3
C205B/3-4	constr. fill/refuse	final series	blade	-	1
C205B/4-6	constr. fill/refuse	final series	blade	-	1
C205B/7-11	constr. fill/refuse	flake	-	-	1
C205B/8-56	constr. fill/refuse	object from macroflake	notched	-	1
C205B/8-52	constr. fill/refuse	final series	blade	-	1
C205B/8-53	constr. fill/refuse	final series	blade	-	1
C205B/8-54	constr. fill/refuse	initial series	blade	-	2
C205B/8-55	constr. fill/refuse	initial series	blade	-	1
C205B/8-58	constr. fill/refuse	final series	blade	-	33
C205B/8-59	constr. fill/refuse	final series	blade	-	3
C205B/8-50	constr. fill/refuse	final series	blade	-	1
C205B/8-60	constr. fill/refuse	final series	blade	-	2
C205B/8-61	constr. fill/refuse	final series	blade	-	17
C205B/8-51	constr. fill/refuse	initial series	blade	-	1
C205B/8-57	constr. fill/refuse	fragment	-	-	1
C205B/9-16	constr. fill/refuse	final series	blade	-	1
C205B/10-13	constr. fill/refuse	final series	blade	-	1
C205B/10-13	constr. fill/refuse	final series	blade	-	1
C205B/10-12	constr. fill/refuse	final series	blade	-	2
C205B/10-10	constr. fill/refuse	final series	blade	-	12
C205B/10-11	constr. fill/refuse	final series	blade	-	2
C205B/12-1	constr. fill/refuse	final series	blade	-	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C205B/13-3	SDC205B-1	final series	blade	-	2
C205B/16-6	SDC205B-4	final series	blade	-	2
C205B/16-5	SDC205B-4	final series	blade	-	1
C205B/16-7	SDC205B-4	final series	blade	-	1
C205B/17-14	SDC205B-5	object from macroflake	edge-mod. tool	-	1
C205B/17-4	SDC205B-5	final series	notched blade	-	1
C205B/17-9	SDC205B-5	final series	blade	-	1
C205B/17-11	SDC205B-5	final series	notched blade	-	1
C205B/17-17	SDC205B-5	final series	notched blade	-	1
C205B/17-19	SDC205B-5	core section flake	edge-mod. tool	-	1
C205B/17-18	SDC205B-5	platform prep flake	-	-	1
C205B/17-15	SDC205B-5	platform prep flake	notched	-	1
C205B/17-7	SDC205B-5	objects from exhausted core	scorpion	-	1
C205B/17-6	SDC205B-5	objects from exhausted core	eccentric	-	1
C205B/17-8	SDC205B-5	objects from exhausted core	eccentric	-	1
C205B/17-10	SDC205B-5	objects from exhausted core	eccentric	-	1
C205B/17-12	SDC205B-5	exhausted core	-	-	1
C205B/17-13	SDC205B-5	exhausted core	-	-	1
C205B/17-16	SDC205B-5	objects from exhausted core	eccentric	-	1
C205B/17-5	SDC205B-5	exhausted core	-	-	1
C205B/20-3	SDC205B-8	final series	lancet	-	1
C205B/21-1	SDC205B-9	objects from exhausted core	eccentric	-	1
C205B/21-3	SDC205B-9	objects from exhausted core	eccentric	-	1
C205B/21-2	SDC205B-9	objects from exhausted core	eccentric	-	1
C205B/7-12	constr. fill/refuse	blade-core frag (non-rejuv)	core section	-	1
C206B/1-8	constr. fill/refuse	final series	blade	-	1
C206B/1-9	constr. fill/refuse	final series	blade	-	2
C206B/2-6	constr. fill/refuse	macroflake	core shaping	-	1
C206B/2-4	constr. fill/refuse	initial series	blade	-	1
C206B/2-4	constr. fill/refuse	final series	blade	-	1
C206B/3-3	constr. fill/refuse	'small' percussion flake	core shaping	-	1
C206B/3-2	constr. fill/refuse	initial series	blade	-	1
C206B/3-1	constr. fill/refuse	initial series	blade	-	1
C206B/4-1	constr. fill/refuse	final series	blade	-	1
C206B/6-1	constr. fill/refuse	final series	blade	-	1
C206B/7-1	constr. fill/refuse	final series	blade	-	1
C206B/10-1	constr. fill/refuse	final series	blade	-	1
C20C/1-1	constr. fill/refuse	final series	blade	-	1
C207B/1-7	constr. fill/refuse	final series	blade	-	1
C207B/1-8	constr. fill/refuse	final series	blade	-	2
C207B/3-13	constr. fill/refuse	final series	blade	-	1
C207B/3-12	constr. fill/refuse	final series	blade	-	1
C207B/3-14	constr. fill/refuse	fragment	-	-	1
C207B/4-4	constr. fill/refuse	final series	blade	-	1
C207B/10-3	constr. fill/refuse	final series	blade	-	1
C207B/10-2	constr. fill/refuse	final series	blade	-	1
C207C/1-5	constr. fill/refuse	final series	blade	-	1
C207C/3-1	constr. fill/refuse	final series	blade	-	1
C207C/4-7	constr. fill/refuse	final series	blade	-	1
C207C/4-5	constr. fill/refuse	initial series	blade	-	1
C207C/4-6	constr. fill/refuse	final series	blade	-	1
C207C/6-1	constr. fill/refuse	final series	blade	-	2
C207C/2-3	constr. fill/refuse	final series	blade	-	1
C208B/7-3	constr. fill/refuse	final series	blade	-	1

Catalog Number	Context	Description 1	Description 2	Part	n=
C208B/9-3	constr. fill/refuse	final series	blade	-	1
C208B/9-4	constr. fill/refuse	final series	blade	-	1
C208B/13-1	constr. fill/refuse	final series	blade	-	1
C208D/7-1	constr. fill/refuse	final series	blade	-	1
C208D/7-2	constr. fill/refuse	final series	blade	-	1
C208D/11-1	constr. fill/refuse	final series	blade	-	1
C208D/13-1	constr. fill/refuse	final series	blade	-	1
C208F/2-1	constr. fill/refuse	final series	blade	-	1

APPENDIX F
ARTIFACTS NOT AVAILBLE FOR ANALYSIS

Catalog number	Object_Lot	Context(s)	Description_1	Description_2	Part	n=
C117F/8-28	C117F/8	SDC117F-1	point	Stem B Point	complete	1
C117F/8-29	C117F/8	SDC117F-1	point	Stem B Point	complete	1
C117F/8-45	C117F/8	SDC117F-1	biface	knife	complete	1
C117F/8-46	C117F/8	SDC117F-1	biface	knife	complete	1
C141B/4-8	C141B/4	SDC141B-1?	-	blade	-	47
C141B/5-7	C141B/5	SDC141B-1?	-	lancet	-	36
C141B/5-8	C141B/5	SDC141B-1?	-	blade	-	31
C141C/5-7	C141C/5	SDC141C-2?	biface	blade	complete	1
C141C/5-8	C141C/5	SDC141C-2?	biface	blade	complete	1
C168B/2-1	C168B/2	-	-	-	-	1
C168B/14-4	C168B/14	-	-	blade frag	-	1
C168B/15-2	C168B/15	-	-	blade frag	-	2
C168B/26-2	C168B/26	-	-	blade frag	-	1
C168B/29-1	C168B/29	-	-	blade frag	-	1
C168B/31-2	C168B/31	-	-	blade frag	-	1
C168B/34-1	C168B/34	-	-	blade frag	-	1
C168C/2-1	C168C/2	-	-	nodule	-	1
C168C/3-2	C168C/3	-	-	blade frag	-	2
C168C/4-3	C168C/4	-	-	blade frag	-	1
C168D/2-3	C168D/2	-	-	blade frag	-	1
C168D/4-5	C168D/4	-	-	blade frag	-	1
C168E/1-1	C168E/1	-	-	blade frag	-	2
C168E/3-1	C168E/3	-	-	blade frag	-	1
C168E/4-1	C168E/4	-	-	flake	-	1
C168E/4-2	C168E/4	-	-	chunk	-	1
C168E/4-3	C168E/4	-	-	blade frag	-	2
C168E/10-1	C168E/10	-	-	blade frag	-	3
C168E/10-3	C168E/10	-	-	partial core	-	1
C168E/11-5	C168E/11	-	-	blade frag	-	4
C168E/14-1	C168E/14	-	-	blade frag	-	1
C168E/15-9	C168E/15	SDC168E-1	-	blade frag	-	11
C168E/15-10	C168E/15	SDC168E-1	-	flake	-	1
C168F/3-1	C168F/3	-	-	blade frag	-	4
C168F/3-8	C168F/3	-	-	blade frag	-	1
C168G/4-2	C168G/4	-	-	blade frag	-	4
C168G/5-1	C168G/5	-	-	blade frag	-	2
C168G/8-1	C168G/8	-	-	blade frag	-	1
C168H/2-1	C168H/2	-	-	blade frag	-	1
C168H/11-1	C168H/11	-	-	blade frag	-	1
C169B/5-1	C169B/5	-	-	blade frag	-	1
C169B/10-1	C169B/10	-	-	blade frag	-	3
C169B/11-1	C169B/11	-	-	blade frag	-	1
C169B/13-2	C169B/13	-	-	blade frag	-	9
C169B/17-6	C169B/17	-	-	blade frag	-	1
C169C/1-3	C169C/1	-	-	blade frag	-	1
C169C/4-1	C169C/4	-	-	blade frag	-	1
C169C/5-1	C169C/5	-	-	blade frag	-	1
C169C/10-2	C169C/10	-	-	blade frag	-	3
C169C/11-1	C169C/11	-	-	blade frag	-	2
C169D/2-1	C169D/2	-	-	blade frag	-	3
C169F/1-2	C169F/1	-	-	-	-	1
C169F/2-1	C169F/2	-	-	blade frag	-	2
C169H/1-2	C169H/1	-	-	blade frag	-	1
C170B/1-1	C170B/1	-	-	blade frag	-	1

Catalog number	Object_Lot	Context(s)	Description_1	Description_2	Part	n=
C170B/1-2	C170B/1	-	-	chunk	-	1
C170B/5-1	C170B/5	-	-	blade frag	-	1
C170B/6-2	C170B/6	-	-	blade frag	-	1
C170C/1-1	C170C/1	-	-	lancet frag	-	1
C170C/2-1	C170C/2	-	-	blade frag	-	1
C170C/8-1	C170C/8	-	-	blade frag	-	1
C170C/9-1	C170C/9	-	-	blade frag	-	3
C170D/2-1	C170D/2	-	-	blade frag	-	1
C170D/4-1	C170D/4	-	-	blade frag	-	1
C171B/1-1	C171B/1	-	-	frag	-	6
C171B/3-5	C171B/3	-	-	frag	-	2
C171B/4-9	C171B/4	-	-	frag	-	11
C171B/6-6	C171B/6	-	-	frag	-	20
C171B/7-2	C171B/7	-	-	frag	-	5
C171B/8-2	C171B/8	-	-	frag	-	3
C171B/9-2	C171B/9	-	-	blade frag	-	1
C171B/11-1	C171B/11	-	-	frag	-	2
C171B/13-1	C171B/13	-	-	frag	-	3
C171B/14-1	C171B/14	-	-	frag	-	1
C171B/15-4	C171B/15	SDC171B-2	-	frag	-	10
C171B/15-8	C171B/15	SDC171B-2	-	frag	-	1
C171B/15-12	C171B/15	SDC171B-2	-	blade	-	1
C171B/15-14	C171B/15	SDC171B-2	-	frag	-	1
C171B/16-1	C171B/16	SDC171B-3	-	frag	-	4
C171B/16-8	C171B/16	SDC171B-3	-	frag	-	4
C171B/17-1	C171B/17	-	-	frag	-	2
C171B/18-5	C171B/18	-	-	frag	-	1
C171B/19-13	C171B/19	-	-	frag	-	2
C171B/24-1	C171B/24	SDC171B-6	-	frag	-	1
C171B/24-2	C171B/24	SDC171B-6	-	frag	-	8
C171B/24-3	C171B/24	SDC171B-6	-	frag	-	2
C171B/24-8	C171B/24	SDC171B-6	-	blade	-	1
C171B/25-1	C171B/25	-	-	blade	-	5
C171B/27-1	C171B/27	-	-	frag	-	1
C171B/28-1	C171B/28	-	-	frag	-	1
C171B/29-1	C171B/29	-	-	frag	-	1
C171B/29-7	C171B/29	-	-	frag	-	2
C171B/31-21	C171B/31	SDC171B-9	-	-	-	5
C171B/31-31	C171B/31	SDC171B-9	-	frag	-	1
C171B/31-32	C171B/31	SDC171B-9	-	frag	-	2
C171C/2-2	C171C/2	-	-	frag	-	1
C171C/3-1	C171C/3	-	-	frag	-	2
C171C/3-2	C171C/3	-	-	frag	-	1
C171C/4-10	C171C/4	-	-	frag	-	4
C171C/4-11	C171C/4	-	-	frag	-	1
C171C/4-12	C171C/4	-	-	frag	-	2
C171C/4-13	C171C/4	-	-	frag	-	4
C171C/5-1	C171C/5	-	-	frag	-	1
C171C/6-2	C171C/6	-	-	frag	-	1
C171C/6-3	C171C/6	-	-	frag	-	1
C171C/7-1	C171C/7	-	-	frag	-	1
C171C/7-11	C171C/7	-	-	frag	-	2
C171C/7-3	C171C/7	-	-	frag	-	1
C171C/7-4	C171C/7	-	-	frag	-	3

Catalog number	Object_Lot	Context(s)	Description_1	Description_2	Part	n=
C171C/8-1	C171C/8	-	-	frag	-	1
C171C/8-7	C171C/8	-	-	blade	-	2
C171C/9-1	C171C/9	-	-	-	-	1
C171C/9-2	C171C/9	-	-	-	-	7
C171C/10-4	C171C/10	-	-	frag	-	1
C171C/11-1	C171C/11	-	-	frag	-	6
C171C/11-2	C171C/11	-	-	frag	-	1
C171C/11-10	C171C/11	-	-	blade	-	7
C171C/13-1	C171C/13	-	-	frag	-	1
C171C/16-1	C171C/16	-	-	frag	-	2
C171D/1-6	C171D/1	-	-	frag	-	2
C171D/1-7	C171D/1	-	-	blade	-	2
C171D/2-1	C171D/2	-	-	frag	-	1
C171D/2-10	C171D/2	-	-	frag	-	3
C171D/2-12	C171D/2	-	-	frag	-	3
C171D/2-13	C171D/2	-	-	chunk	-	1
C171D/3-1	C171D/3	-	-	frag	-	1
C171D/5-1	C171D/5	-	-	frag	-	2
C171D/5-3	C171D/5	-	-	frag	-	1
C171D/7-1	C171D/7	-	-	frag	-	2
C171D/7-2	C171D/7	-	-	frag	-	1
C172B/5-3	C172B/5	-	-	frag	-	1
C172B/10-1	C172B/10	-	-	frag	-	2
C172B/12-1	C172B/12	-	-	frag	-	1
C172B/17-1	C172B/17	-	-	frag	-	2
C172B/27-2	C172B/27	-	-	frag	-	1
C172C/2-2	C172C/2	-	-	frag	-	1
C172C/2-6	C172C/2	-	-	-	-	1
C172C/3-1	C172C/3	-	-	frag	-	1
C172C/5-3	C172C/5	-	-	frag	-	1
C172C/12-2	C172C/12	-	-	frag	-	1
C172C/12-3	C172C/12	-	-	frag	-	2
C172C/14-2	C172C/14	SDC172C-3	-	partial blade	-	1
C172C/14-3	C172C/14	SDC172C-3	-	frag	-	1
C172C/19-4	C172C/19	-	-	frag	-	3
C172C/20-2	C172C/20	-	-	frag	-	1
C172C/22-1	C172C/22	-	-	frag	-	1
C172D/2-1	C172D/2	-	-	frag	-	2
C172E/1-2	C172E/1	-	-	frag	-	2

APPENDIX G
HYPERLINK TO PERCUSSION TECHNIQUE DATA

http://ufdc.ufl.edu/IR00008319/00001 (see Appendix G worksheet)

APPENDIX H
HYPERLINK TO PRESSURE TECHNIQUE DATA

http://ufdc.ufl.edu/IR00008319/00001 (see Appendix H worksheet)

APPENDIX I
HYPERLINK TO PERCUSSION REJUVINATION TECHNIQUE DATA

http://ufdc.ufl.edu/IR00008319/00001 (see Appendix I worksheet)

APPENDIX J
HYPERLINK TO BLADE-CORE AND BLADE-CORE FRAGMENT DATA

http://ufdc.ufl.edu/IR00008319/00001 (see Appendix J worksheet)

APPENDIX K
HYPERLINK TO NON-BLADE-CORE RELATED OBJECT DATA

http://ufdc.ufl.edu/IR00008319/00001 (see Appendix K worksheet)

APPENDIX L
HYPERLINK TO UNDIAGNOSTIC DEBITAGE DATA

http://ufdc.ufl.edu/IR00008319/00001 (see Appendix L worksheet)

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BIOGRAPHICAL SKETCH

Lucas R. Martindale Johnson was born in up-state New York, but grew up in Vero Beach, Florida. After high school and community college, he attended the University of Central Florida where he began drafting ceramic artifacts for the Caracol Archaeological Project in Belize and participated in both the 2000 and 2001 field seasons. After graduating in 2001 with a Bachelor or Arts in Anthropology, he moved to Davis, CA. and worked for Far Western Anthropological Research Group, Inc., a cultural resources management firm. While working in California, Lucas was able to work for a season in Ecuador and spend two lengthy seasons at Palenque, Mexico. Later in 2006, he was accepted into the master's in Anthropology at the University of Central Florida and again, participated in three field of Caracol's seasons (years 2007, 2008, and 2009) and continued to draft artifacts from the site. After graduating again from the University of Central Florida with a Master of Arts degree in Anthropology which focused on Maya lithic technology and craft production from Caracol, Belize, he was accepted to the PhD program at the University of Florida in 2009, continued to work at Caracol, and graduated with a Doctor of Philosophy in 2016. He continues to study lithic technology in hunter-gather-fisher and complex societies.

Lucas is married to Lisa M. Johnson, living in Berkeley, CA, and they have three children. They moved to Berkeley in 2012 where Lisa is pursuing a PhD in Anthropology. Lucas is, currently working for Far Western Anthropological Research Group, Inc. as the lithic analyst and a senior archaeologist.