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Local Technology and Shifting Sociopolitics: A Hunter-Gatherer Case Study on Santa Cruz Island, northern Channel Islands, California

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Local Technology and Shifting Sociopolitics: A Hunter-Gatherer Case Study on Santa Cruz Island, northern Channel Islands, California

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Anthropology

by

Scott David Sunell

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ABSTRACT OF THE DISSERTATION

Local Technology and Shifting Sociopolitics: A Hunter-Gatherer Case Study

on Santa Cruz Island, northern Channel Islands, California

by

Scott David Sunell

Doctor of Philosophy in Anthropology

University of California, Los Angeles, 2018

Professor Jeanne E. Arnold, Chair

One of the central and ongoing efforts of contemporary archaeology lies in identifying explanatory mechanisms for change through time in human societies. Details of the pace, impetus, material culture correlates, and sociopolitical context for these changes are often hotly debated. For researchers studying Chumash society of the Santa Barbara Channel region, the archaeological record provides a basis for understanding these dynamics through time, reflected in both settlement systems and labor organization (Arnold 2001a; Perry and Glassow 2015). I analyze Laguna Canyon, a major drainage located on the south side of Santa Cruz Island in the Santa Barbara Channel, where evidence of resource use during the late Middle period (600-1150AD) reveals a locally focused trajectory of residential tool manufacture, reflecting a nuanced response to contemporary sociopolitical change. Two patterns emerged during this work. First, Laguna was most intensively occupied during the late Middle period with ten sites dating to that span. By contrast, during the Transitional period (1150-1300 A.D.) use of the canyon focused on a single site. The pattern in Laguna is like that of canyons with large permanent villages (Arnold 2001b, Peterson 1994; Perry and Glassow 2015). Second, the occupants of Laguna made microliths from local igneous materials during the late Middle period but imported formal chert microtools during the Transitional period. Locally-oriented systems of occupation and production in the late Middle period were supplanted by regional ones during the Transitional period. In this assemblage I identify change through time that suggests a nuanced process of accommodation with both intra-island and regional dynamics, inflected by cultural

preferences in lithic procurement and a continuing emphasis on local raw materials that makes the record of Laguna Canyon an important source of data for understanding change through time in Chumash society and among complex hunter-gatherers generally.

The dissertation of Scott David Sunell is approved.

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2018

To my wife, Hilah, who supports me, and to my family, who inspire me.

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Sunell, S.D. (2016) "Transitions to Sociopolitical Complexity: The View from Laguna Canyon, Santa Cruz Island, California" *Backdirt: Annual Review*.

Sunell, S.D., J.E. Arnold (*In Progress*) "The Antecedents to the Specialized Microdrill Industry on Santa Cruz Island, CA"

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Chapter 1 - Introduction

Beginning in the 17th and 18th centuries, European natural philosophers turned their attention to explaining the diversity of human social organization globally. To address this challenge, the predecessors of anthropologists sought to understand change through time and to find explanatory factors underlying differences among societies. Early archaeologists drew on this body of theory, laying one of the cornerstones of their theory on the assertion that subsistence, technology, and the complexity of society were necessarily linked. The known archaeological record at the end of the first full century of intensive scientific investigation largely supported this position.

At least one clear flaw of this record emerged in the subsequent half-century. Few regions of the world possess a relatively undisturbed archaeological record of complex hunter-gatherers. As researchers documented increasing numbers of such groups, they had no easy explanation for them. Early archaeologists studying hunter-gatherers often focused on subsistence practices and human-environment interactions at small scales. The groups of ethnographically recorded hunter-gatherers that served as the model for what hunter-gatherers were did not often demonstrate the kinds of elaborate sociopolitical structures evident among complex hunter-gatherers, compounding the problem (Wengrow and Graeber 2015). Evolutionary models of human culture founded on this approach therefore often deal in the energetics of hunter-gatherer lifeways while eliding the evolutionary importance of cultural landscapes and the decisions of agents within these societies.

Because the dominant models struggled to account for sociopolitical structure, archaeologists treated regions of the world with extensive records of complex hunter-gatherers as outliers from the evolutionary currents of human society. Rather than drawing links between the sociopolitical innovations among these groups and the broader discussion about group variability and change through time in all societies, researchers in the 20th century emphasized technological and environmental explanations for hunter-gatherer variation. Human societies were therefore historical or ahistorical. Hunter-gatherers, simple and egalitarian, lived in a world dictated by environment and available technology. Complex societies grew from specific innovations that allowed humans to move beyond these challenges. Evolutionary models in this vein persist, but this position is untenable today. The record of southern California, and of many other regions, problematizes this approach.

Continuing study of the material record of the Chumash, the people of the Santa Barbara Channel region, has led to a deeper and more nuanced understanding of the importance of complex hunter-gatherers in cultural change through time. This region encompasses the four northern Channel Islands (Anacapa [ANA], Santa Cruz [SCRI], Santa Rosa [SRI], and San Miguel [SMI]) and the adjacent mainland coast of Santa Barbara and Ventura counties. The broader region of southern California includes an additional four southern Channel Islands (San Nicholas [SNI], Santa Barbara [SBI], San Clemente [SCI], and Santa Catalina [SCAI]) and the area of modern Los Angeles, occupied by the Tongva at the point of ethnohistoric contact. Expanding on the rich ethnohistoric record of both the Chumash and the Tongva respectively, archaeologists identify robust evidence for craft specialization, hereditary leadership, and sociopolitical dynamics that developed at the beginning of the second millennium AD, with clear links to earlier patterns that developed at least five centuries prior (Arnold 2001a; Gamble and Russell 2002; Kennett 2005; Perry 2013). Among the Chumash of the northern islands, these

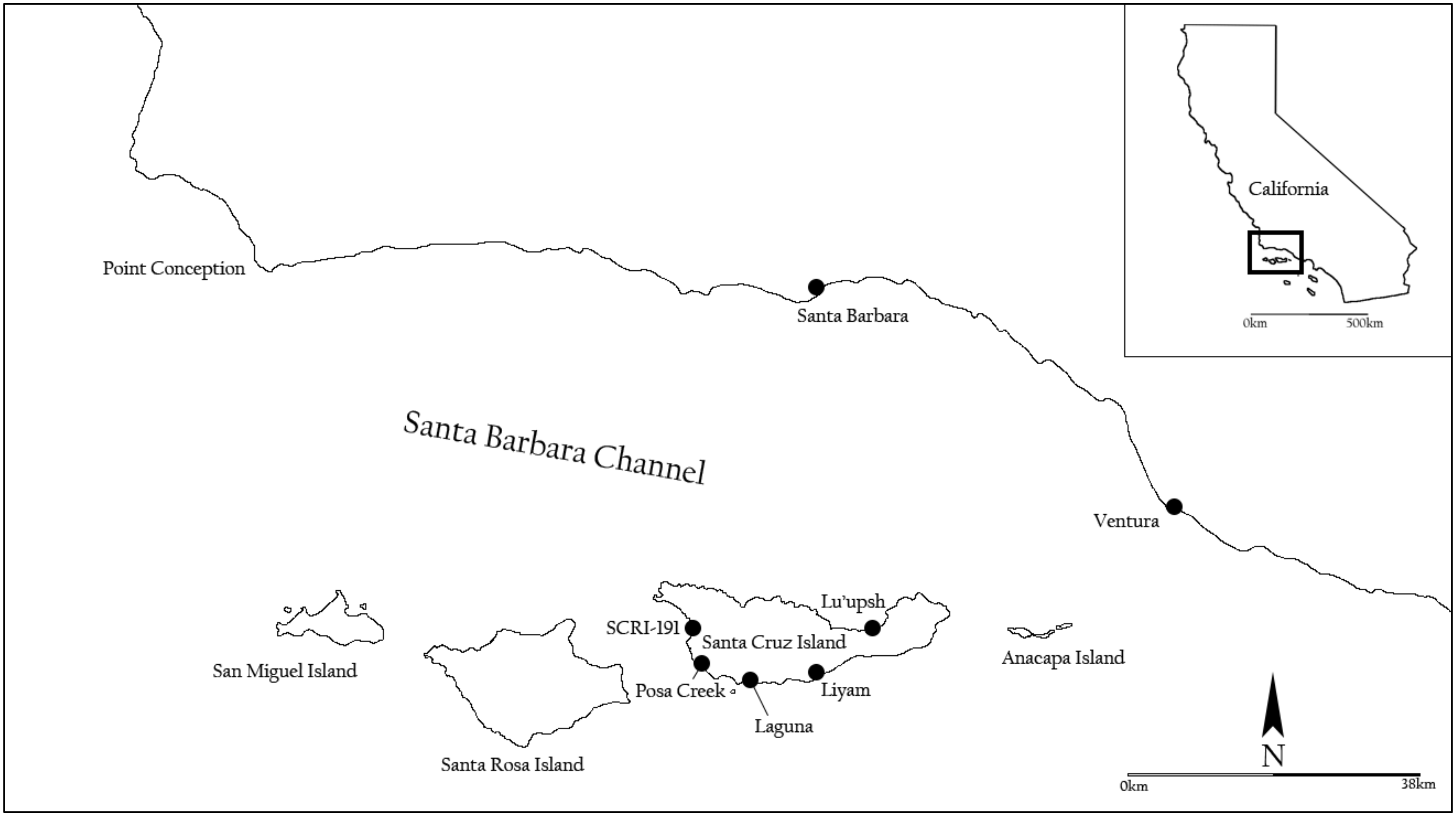

FIGURE 1A: MAP OF THE NORTHERN CHANNEL ISLANDS AND THE SANTA BARBARA MAINLAND
(MAJOR ISLAND SITES MENTIONED IN THE TEXT ARE LABELED; MAP CREATED BY S. D. SUNELL, BASE LAYER FROM GOOGLE EARTH)

(and other) scholars identify an intensive, specialized *Olivella* shell bead production industry that dominates the later history of the region. There is continuing debate over the impetus for its development, but the implications are clear. This work challenges the link between complexity and technological/environmental variables, suggesting that sociopolitical relationships among individuals and groups were the primary drivers for the development of complexity among the Chumash.

The evidence from the Santa Barbara Channel is not perfect, however. Archaeologists mainly excavated major coastal sites from the late 19th century onward; therefore, the bulk of the extant record derives from a relatively limited sample of sites. Relatively few researchers emphasized the importance of settlement systems within the islands themselves, focusing instead on these large sites without connecting them directly to interior sites. Some ongoing research seeks to address this issue, and earlier exceptions exist (e.g. Kennett 2005; Perry and Glassow 2015; Peterson 1994). Favorable locations and abundant resources may have insulated people living at those sites against some change. SCRI was a major center in the development of this pattern through time because it was more favorable than the other northern islands and even some areas of the adjacent mainland. My discussion of peripheral areas on SCRI, focused on the occupation of a major drainage on the south side of the island called Laguna, is framed within this context. Generally, large coastal sites dominated the settlement pattern on SCRI, but important evidence of earlier and more widely distributed settlement survives as well. Small but permanent sites in comparatively marginal locations on SCRI provide better evidence to test hypotheses about emergent complexity, especially with respect to the importance of environmental and sociopolitical dynamics at the cusp of sociopolitical complexity.

Project Goals and Results

I address two hypotheses in this project. First, I connect the assemblage drawn from Laguna Canyon to those of the major coastal villages. I find that assemblage patterns at the Laguna sites share more in common with contemporary coastal villages than they do with logistical camps. The occupation in Laguna should therefore be considered an important, permanent component of the settlement system, connected to nearby coastal villages but not simply extensions of them (corresponding to secondary villages in Kennett's [2005] typology). The occupational history of Laguna shows a clear pattern through time, parallel to similar shifts on both SCRI and SRI. Initially, those living in Laguna beginning around 600 AD adapted tool production and landscape use to suit available resources and occupied much of the drainage relatively intensively. That changed toward the end of the first millennium AD. Across the islands, people abandoned many interior sites and moved to a smaller number of larger settlements concentrated on a few well-watered drainages (Arnold 2001; Jazwa et al. 2017; Perry and Glassow 2015; Peterson 1994). The occupants of Laguna remained, but they responded to these changes. The occupation of the canyon centered on a single site after this period. However limited, this occupation still stands in stark contrast to complete abandonment in nearby drainages. For example, islanders abandoned Posa Creek entirely despite relatively more favorable conditions there compared to Laguna. Further, nothing about the physical environment of Laguna provides compelling evidence for its continued occupation. This suggests that other factors were more important to its occupants and outweighed challenges caused by changes in the local environment.

Second, I analyze a component of these assemblages unique in the archaeological record of SCRI, igneous microblades and associated production detritus, to assess production patterns within the broader context of changes in production there. I find a single general reduction sequence for both chert and igneous materials in the latter half of the first millennium AD based on debitage patterns. Producers in Laguna applied microlithic techniques to all suitable cores, regardless of material class. This approach changed during the same span as the changes in occupation. Specialists on the east end of the island began to produce formal microdrills in the early second millennium AD, and around that point the occupants of Laguna stopped producing local microlithic tools and began importing formal drills. I present data to support the assertion that this was the result of the increasing importance individuals placed on participation in the emerging bead production system on SCRI, rather than functional considerations based on material types. Furthermore, attempts to replicate microdrills in local materials ended when the import of formal chert drills began. No matter what the tool assemblage, however, those living in Laguna never produced large quantities of beads (especially compared to those living in the nearby Posa Creek and Coches Prietos sites). The use of local stone to replace increasingly restricted chert cores for certain tools, followed by the adoption of this toolkit, supports the interpretation that use of these materials was most closely tied to connections among islanders, rather than the functional characteristics of the stone. This also hints that the actual use of drills for drilling shell beads was less important than possession of the tools themselves. This pattern supports the position, articulated elsewhere as well, that throughout all periods of occupation of Laguna, chert (and chert tools) occupied an important symbolic position in the lives of islanders (see also Pletka 2001a).

Local environments, regional climate disruption, and shifting sociopolitical realities alike served as the background for these changes, but the choices made by the occupants of Laguna appear to have been informed more by the social relations of production than by impacts to subsistence or to the means of production themselves. The occupants of Laguna, like others across SCRI and on the other northern Channel Islands, responded to the upheavals of the late first millennium AD by adopting what were initially locally contingent strategies. The importance of individuals and small groups in this productive system resulted in greater variability among drainages (seen widely on the islands during this period, e.g. Arnold 2001a; Kennett 2005).

The specialized bead industry replaced these local approaches. The Laguna assemblage, containing material spanning this period of change, therefore provides a window into the production processes connected to the cultural landscape of the late first millennium AD. Those living in the canyon initially attempted to adapt existing, locally focused production processes to the emerging bead industry, but ultimately abandoned that effort. This illuminates the shape of a past adaptive landscape as the occupants of Laguna sought a local optimum in balance between natural and cultural factors. Because of their choices, changes in production and occupation in Laguna reflect decisions made by individuals about how to participate in the developing complex sociopolitical structure on the islands.

Chapter 2 – Cultural Evolution and Complex Hunter-Gatherers

My goal in treating the record of Laguna in adaptive terms is to understand the adaptive cultural landscape that grounded evolutionary change in the region. Recent work on the northern Channel Islands often emphasizes human-environment interactions within the context of Human Behavioral Ecology theory (hereafter referred to as HBE). This lens has produced important results, especially in tracking subsistence practices through time. The drawbacks of HBE, however, have simultaneously led to a neglect of the role of agents and small groups in those changes. I evaluate the artifactual record of decisions that islanders made about how to invest their labor by tracking lithic production through time rather than attempting to model or reconstruct the variables that individuals may have considered when making those decisions. I seek to assess decision-making from this perspective both to complement the work done within the HBE rubric and to expand the useful application of the evolutionary metaphor to change through time in human societies.

At the core of my approach is the idea that the choices of those living in Laguna reflect changes in the underlying logic of the organization of labor during the critical period on the islands when complexity first developed. The nature of complexity itself is central to this argument. Following Arnold, I define a “complex” society as one in which some individuals can control the labor of non-kin in a sustained manner (Arnold 1996a, 1996b, 2001a). This identifies what is likely the primary evolutionary step in sociopolitical structure since the origin of behaviorally modern humans. It is the sustained nature of these relationships among non-kin that is critical. All societies are stratified, at least ephemerally, based on the personal characteristics of individuals (age, charisma, etc.) and their network of relationships. Alienation of labor deriving from this occurs in any human group, regardless of scale. It is important to distinguish between temporary or kin-oriented sociopolitical differentiation and the development of mechanisms that extend durable labor control beyond those bounds. In this sense the origin of complexity is the origin of the struggle among individuals and groups over the social relations of production (Marx 1867/1994). Historical context frames this struggle in different terms everywhere, and the opportunities for the development of complexity are likely as diverse as the human societies in which they occur.

Features of a given society at a specific point in time informed the terms of that struggle and are therefore frequently the target of archaeological study. Evaluating the variation in subsistence regimes, technology, ritual participation, population pressure, environmental circumscription, and the nature of interpersonal conflict that played roles in individual culture-historical trajectories is important. These observations provide a framework for interpretation of change that can incorporate cultural evolutionary thinking, but also predispose archaeological inferences to materialist interpretations that may or may not be useful in a given case (Bender 1978). Theorists arguing in favor of these features as themselves central to cultural evolution have struggled to explain change without requiring numerous idiosyncratic exceptions, especially among hunter-gatherer groups (Binford 2001).

Because of the ease with which features of hunter-gatherer society can be readily linked to subsistence and environment, archaeologists often fail to go beyond treating hunter-gatherers in natural terms. These problems persist in systems-level models like HBE. The ways in which these models fail in some cases is instructive, and my approach to HBE-focused work in southern California builds on critiques advanced by Kohler and others who advocate for agent-based models (Kohler 2000). They address what Kohler (himself following Collingwood) calls the “outsides” of social processes (Collingwood 1946). In this vein, archaeologists who hope to understand the origins of sociopolitical complexity must emphasize the underlying forces responsible for cultural evolution rather than simply identifying features of the archaeological record that correlate with complexity.

This approach developed rapidly in the wake of the post-processual critique of the discipline, especially in fields like early domestication and plant use (see: Hoffmann et al. 2016; Zeder 2011). The study of complex hunter-gatherers was strongly affected as well. Increasingly widespread and increasingly clear evidence for the historically contingent sociopolitical forces among hunter-gatherers drove the shift in perspective (Arnold et al. 2016; Pauketat 2007; Prentiss and Lenert 2009; Zeder 2009). Situating the impetus for change in individuals reshaped the role that complex hunter-gatherers play in an evolutionary understanding of human societies. This shift freed archaeologists to assess hunter-gatherer history on its own terms, without which a meaningful use of the evolutionary metaphor was impossible. Expanding the model to include both revolutionary (*sensu* Childe 1936) and historic (see Pauketat 2001, 2007) approaches accurately reflects cultural evolutionary processes. Identifying archaeological manifestations of these forces demands that researchers utilize explicitly political and anthropological approaches when considering cultural evolutionary trends (Arnold et al. 2016; Brumfiel and Earle 1987; Earle 1997; Hayden 2001; Stanish 2004, 2013).

The intersection of individual identity, participation in social groups, and internal and external competition and cooperation condition this model. Individual choices about adopting cultural traits and modifying the cultural environment in which those traits are expressed is the driving force of any human society (Aunger 2009; Kohler 2000; Mann 1986; Roscoe 2000). In cultural environments, innovation and cultural evolution rely on the presence of many competing strategies that both generate and resolve stresses within the cultural system. These strategies can be equally selected for or against in changing times. The pursuit of needs via culturally mediated wants (*sensu* Roscoe 2000) is therefore linked to the expression of power, itself deriving from the social relations of production (Marx 1867/1994; Roscoe 2000).

Scholars working in the Pacific Northwest coast (and associated groups of the interior Canadian plateau), in the New Guinea Highlands, and in California beyond the Santa Barbara Channel have conducted particularly compelling work in this vein. I review case studies from these regions to provide comparisons for this project, before connecting this body of evidence to my discussion of change through time on SCRI.

PACIFIC NORTHWEST COAST AND CANADIAN PLATEAU

The role of hierarchy and labor control on the Northwest Coast has been studied since European contact and has given rise to a significant body of scholarship in anthropology (Boas 1897; Kroeber 1923; Mauss 1950/1990). One of the primary driving forces behind study in the region was the inability of progressive models of cultural evolution to account for large, territorial hunter-gatherer groups with clear signs of internal inequality (including slavery). This region was the first outlier in the evolutionary schemes of the 19th century to gain widespread recognition among archaeologists. Study of the region was also a ripe domain for the social and psychological approach to culture of the Boasian school in the early 20th century (Boas 1940; Kroeber 1925, 1952; Lowie 1920). More recent work on households, labor, and subsistence practices blend evolutionary and political approaches successfully in addressing the development of complex society (among many others: Ames 1995, 2001, 2006; Cannon 2002; Coupland 2006; Coupland et al. 2016; Donald 1997; Martindale 2006). This work identifies close ties between complex sociopolitical structures and both labor and settlement patterns. Neither primarily technological nor environmental explanations are sufficient to describe change through time in the region.

One result of these scholars' efforts is the highly detailed context they present. A primary case of this work is the analysis of labor and settlement patterns centered on the site of Namu, located in the ethnographic territory of the Heiltsuk people (Cannon 2002). Around Namu, changes in settlement patterns suggest significant variability in subsistence practices and the organization of labor through time. Focusing mainly on food remains, researchers identified six types of sites based on the context, concentration, and intensity of production (Cannon 2002). Villages were identified as sites with large middens containing high densities of salmon (for winter occupations) or herring (for spring/summer) tied to the spawning periods for those fish species. Four types of camps were also identified: base camps based on moderate midden size and a wide range of activities; multipurpose camps, similar to base camps but smaller; special-purpose camps based on moderate to large midden sizes and a limited range of activities; and rocky-islet camps, which could not have been occupied for more than a very short period and represent special-purpose harvesting locales (Cannon 2002). There are important similarities between these site types and those proposed for the northern Channel Islands, where primary and secondary villages parallel Cannon's villages, base camps, and multipurpose camps, with smaller sites and special-purpose camps occupying similar positions in the settlement hierarchy (Cannon 2002; Kennett 2005). The distribution of these sites is important because harvesting fish during spawning runs required significant labor, and the density of faunal remains at these sites demonstrates that subsistence practices were intensive and concentrated seasonally at certain locales. Similar arguments are made for shellfish harvesting in the Santa Barbara Channel (e.g. Perry and Glassow 2015; Winterhalder et al. 2010).

The influence of sociopolitical structure on settlement patterns is well-documented. One prominent example comes from the area around the site of Namu. In its earliest phases, settlement focused on Namu itself while other areas were unsettled, but around 2500 BC use of the landscape diversified (Cannon 2002). Cannon argues that ritual ties between subsistence and the rights of individuals to the productivity of specific resources restricted the expansion of population in the area around Namu. This resulted in a range of potential site loci that went unoccupied for long periods despite their suitability (Cannon 2011). At times, some of those locations were more suitable for resource extraction than Namu itself. Many were in fact later occupied successfully over long spans (Cannon 2011). This occurred despite repeated subsistence shortfalls at Namu itself, any one of which should have caused individuals to occupy those locales if productivity was their primary concern. No evidence suggests why a given period of resource stress would lead to changes in subsistence patterns, when many similar events did not (Cannon 2002). Ethnographic analogy, however, provides some insight.

Among the Heiltsuk, in whose land Namu is located, the ritual re-enactment of encounters between mythical ancestors and supernatural forces was the foundation of settlement, linking people and resources in cycles of consumption. Feasting was therefore critical in tying ritual permanence to the sites of winter villages, and without that ritual settlement at other locations was not an option (Cannon 2011). Other ethnographic observations in the region from the period of European contact record the importance of attracting the labor of non-elites through shows of ritual power, subsistence productivity, and resource control, and the archaeological patterns of protohistorical settlements mirror those of early periods (Ames 1995; Cannon 2002). The archaeological evidence suggests that, without a materialist explanation, the structure of belief led to the settlement patterns observed and in turn both prevented and later permitted the expansion of sites beyond Namu (Cannon 2011). Sociopolitical organization conditioned subsistence success, rather than the availability of resources on the landscape. It was through manipulations of labor and control over resources that political evolution proceeded on the Northwest Coast. Researchers suggest that the limited nature of large chert deposits on eastern SCRI had a similar effect on the development of complexity in the Santa Barbara Channel, though they propose a variety of different mechanisms (Arnold 1987; 2001a; Perry 2004; Perry and Jazwa 2010).

On the Northwest Coast these dynamics existed beyond subsistence and occupational patterns alone. Household-oriented production identified at Ozette suggests that families of chiefly status worked less than others at daily tasks, hosted feasts, and controlled access to prestige goods (Ames 1995). The presence of high-ranked fish elements, the large size and central positioning of some houses, and high densities of prestige goods distinguish elite households. The importance of households as the locus of labor organization is clear from the archaeological record. The scale and intensity of production depended on the prominence of the house (Ames 1995). Even within individual households, the patterns of deposition of various goods mirrored the labor relationships and prestige of the occupants. Higher status individuals occupied the back of the house, while lower status individuals were near the front (Ames 1995). In addition to the comparison of domestic refuse, mortuary assemblages demonstrate that access to prestige goods was variable and dependent on status. Labret wear on the teeth, associated ethnographically with elites, began at a very early date (Ames 1995). Also attested ethnographically but difficult to identify in the archaeological record, evidence for slavery can be seen in mortuary profiles, unconventional burial poses, and sacrifice, according to Ames, who argues that slavery has a deep history in the region, significantly predating colonial contact (Ames 1995). Acknowledging the possibility of raiding as an explanation for the same patterns, the archaeological data connect the organization of labor to the level of household production managed by elite individuals within them who were able to enhance their positions by attracting followers (Ames 1995, 2006).

Although located inland from the coast, subject both to unique forces and possessing a unique history, the Canadian plateau shares some important similarities in sociopolitical dynamics with cultures documented on the coast. At the Bridge River site, archaeological work revealed that even in times of subsistence stress, when there was observable development of inequality at a household level, storage volume remained relatively constant, connected more to house size than to wealth (Prentiss et al. 2014). The authors suggest that the reorganization of ownership of and access to food supplies during those periods, in the context of kinship links among households of varying status, sparked the development of inequality (Prentiss et al. 2014). This may itself have given rise to a need to attract and control surplus labor (Ames 2006). Subsistence practices were not the only arena for household-centered dynamics, and the forces affecting labor organization and resource access extended to other aspects of life in the region.

At Keatley Creek (located only a short distance to the east of Bridge River), multi-millennia links between specific households and specific raw material sources suggests that similar considerations were extended to the use and ownership of lithic resources (Hayden et al.

1996). Hayden et al. identify differences in the areas from which each household collected stone, differences in access to materials, and extremely long-term stability in these patterns as features of the archaeological record. These patterns demonstrate the connection between sociopolitical structure and resource access as a feature of complex hunter-gatherer societies. Furthermore, subsequent work at Keatley Creek suggests that similar pressures in access to and ownership over food resources drove inequality there, as they had at the Bridge River site (Prentiss et al. 2007). The record from both sites has important parallels to local raw material access in the Santa Barbara Channel region. Although data are currently lacking to draw a direct connection between stable, long-term kin-group ownership of lithic sources on the Channel Islands and households at major villages, the developing bead industry strongly suggests a similar process to the one evident at Keatley Creek.

The archaeological record of this region suggests that sociopolitical considerations about how and where to invest labor have the greatest explanatory power for change through time. Elites attracted followers by demonstrating an ability to support them, thereby gaining some measure of control over their labor. Household-level labor organization provided the context for both the development of inequality and its institutional underpinnings. Also crucial to this equation was the way in which these strategies failed or changed through time, creating a context out of which new systems could develop. But this kind of change is not restricted to household labor organization.

HIGHLAND PAPUA NEW GUINEA

The dynamics that conditioned complexity in the broader Northwest Coast region are not unique. In a very different context, and with differences in both trajectory and outcome, ethnographic work with the Enga of highland Papua New Guinea in the 20th century demonstrates that the adoption of new sociopolitical systems depended on the formalization of contingent ritual practices that offered solutions to group problems rather than the reorganization of labor relationships (Wiessner 2002).

The development of new sociopolitical structures among the Enga centered around a specific, historical renegotiation of intertwined rituals: the Tee cycle, certain kinds of cult activity, and the Great Wars (Wiessner 2002). Formalization of the Tee cycle and the Great Wars occurred when many different leaders realized the potential for such activity to provide new arenas for social action and competition as well as address group problems that they had no other means of resolving. The importation and elaboration of new rituals from related neighboring groups held advantages for much of Enga society, elites and non-elites alike (Wiessner 2002). The exercise of ritual power was itself confined to elites, requiring consumption of costly goods or access to restricted knowledge. This separated those individuals from others and allowed them to control both supernatural and interpersonal relationships (Weissner 2002). This pattern is pervasive among complex hunter-gatherers the world over, especially in California (Bead 1974; Blackburn 1974; Durkheim 1912/2001; Graeber 2001, 2011; Goldschmidt 1951; Hayden 2001 Kroeber 1925, 1952; Loeb 1932, 1933). Unlike many other groups, however, the Enga maintained a strict division of the temporal and spiritual realms. Ritual practitioners could not compete in economic exchanges, and political leaders contracted ritual performances rather than pursuing that task themselves (Wiessner 2002). Sociopolitical and ritual innovations therefore cannot be tied to economic or subsistence changes in this case. This is further clarified by the history of subsistence practices in the region.

The introduction of the sweet potato and the resultant surplus represented an entirely new avenue for competition and the accumulation of power in the region. Instead of sociopolitical change accompanying new subsistence patterns, centuries passed with little change in sociopolitical structure. When change came, neither sweet potato production nor resource stress were the cause (Wiessner 2002). Developing sociopolitical structure in the case of the Enga is less directly linked to complexity than on the Northwest Coast, but participation in the Tee Cycle and Great Wars demonstrates the influence of local histories on innovation in ritual and sociopolitical structures.

CALIFORNIA

Addressing the past along similar lines is not new in the history of anthropology in California. Alfred L. Kroeber set the tone during his time as a student and colleague of Franz Boaz. He, and his own students, addressed the region as a collection of small polities characterized by linguistic grouping and shared cultural features (Kroeber 1925). In keeping with Boasian thought, these scholars emphasized individual psychology and its connection to mythico-religious systems throughout their works (e.g., Goldschmidt 1948; Loeb 1932, 1933). The description of material culture correlates for these sociopolitical systems is also treated with detail (Gifford 1940, 1947). Collectively they rejected the 19th century evolutionary thought of Morgan and others (Carniero and Perrin 2002; Morgan 1877; Spencer 1895), but consequently failed to address change through time. They also failed to connect the existence and development of complex groups in California to similar societies elsewhere, except by reference to Northwest Coast societies with which they were familiar. The comparisons that they did make were hardly meaningful in any case. Kroeber himself couched this in terms of “higher” and “lower” levels of culture, rather than any consideration for the operation of those societies themselves (Kroeber 1925:1-6). Kroeber and his students did have some competition as researchers in the early 20th century, notably from J.P. Harrington (by coincidence primarily working in the Santa Barbara Channel region and southern California) and C. Hart Merriam (Harrington 1916; Merriam 1926). They shared the theoretical orientation of their peers, but both men published relatively little during their lifetimes, unlike Kroeber and other contemporaries. Researchers continue to study their accumulated notes, however, and their research produces significant results to this day due to that ongoing work (Heizer 1978; Hudson and Blackburn 1982-1987; Johnson 1982, 1988).

These investigators conducted their work in the context of rapid demographic changes that drastically altered the region over the 18th and 19th centuries and continued to do so throughout the twentieth. In less than half a century in some cases, the people of California faced the devastation of the establishment of the missions, subsequent secularization, the rush of Anglo settlers from the 1840s onward, and the transformation of California into a US state (Cook 1978; Moratto 1984). Anthropologists contributed in their own ways to this process in the late 19th and early 20th centuries, to continuing devastating effect on descendant communities (Lightfoot 2005). Early scholars, whatever their personal intent, produced arguments frequently marred by unfounded assumptions and bizarre comparisons. Loeb, for example, suggests that the *Kuksu* religion was an import of Mesoamerican Quetzalcoatl ritual (Loeb 1932). Beyond the implicit and explicit racism that many of these early researchers enshrine in their works, anthropologists' influence on the process of federal recognition in California impacted southern California groups particularly strongly (Castillo 1978; Field 1999; Lightfoot 2005). Because of this history, their most valuable and enduring contributions are descriptive.

Though marred by these flaws, the foundation of archaeology throughout California is still built on the substantial corpus that resulted from their research. They documented a region of profound sociopolitical sophistication, and these data still ground arguments about and descriptions of California prehistory (e.g., Bettinger 2015). One such contribution is the detailed descriptions of the close connections between ritual power, religious symbolism, and the operation of wealth and status in many California groups (Bean and Vane 1978; Goldschmidt 1951; Loeb 1932, 1933).

One important consequence of the connection between ritual and labor was the development of a context for intensification (and, in some cases, specialization). Many part-time occupations were common among the Pomo: money maker, stone drill maker, obsidian flaker, net maker, flint chipper, and bow-arrow maker (Arnold 1987; Loeb 1926). The intensity with which individuals participated in their professions varied, however (Gifford 1926). Whatever the specific profession or the degree to which specific producers invested labor into a task, they passed their professions down along matrilines, linking kin-groups to types of production (Loeb 1926). Some groups like the Southeastern Pomo also monopolized resources within their territory, further strengthening their relationship to specific professions (Loeb 1926). In addition to these descriptions of craft production and labor intensification, Loeb described the Kuksu society in northern California in detail (Loeb 1932, 1933).

Many groups in the area north of San Francisco Bay, primarily the Maidu, Patwin, and Pomo, adapted the kuksu religion to suit local preferences, with some change in practices from north to south and east to west. Among the Patwin, for example, there were internal divisions of rank among members, with the highest position (and greatest knowledge) reserved for the *Moki*, who attained that status by acting as assistant to the previous Moki (Kroeber 1925:372). Novices hoping to acquire this knowledge paid for the privilege. The danger inherent in utilizing this knowledge incorrectly, however, and the possibility of an instructor intentionally leading astray an insufficiently generous student, meant that near kin were the most common recipients of such knowledge because of their implicit loyalty (Kroeber 1925:373). Men of a range of social statuses joined the kuksu society in this context, but both these familial relationships and ability to finance membership via bead currencies favored the children of high-status individuals (Bean and Vane 1978; Gamble 2008). A combination of temporal and ritual power therefore often characterized members of the kuksu. Furthermore, participation in the broader society by such individuals connected social stratification evident at each local community to a broader network of status ranking in each of these groups. Loeb, and others, suggest that members of the kuksu society joined mainly to participate in intervillage ceremonies and dances. The existence of such a society created a context for the institutionalization of those relationships beyond the bounds of kinship and across otherwise independent communities. A similar society existed among the Chumash.

Fernando Librado, in interviews with Harrington, described the *'antap* that existed by the ethnohistoric period (Librado and Harrington 1977). Members of this society were present in all of the named historic villages in the region, on both islands and mainland alike (Bean and King 1974). Individuals from SCRI participated in all aspects of the society, acting as dancers, singers, and administrating *toloache* (*D. wrightii*) (Johnson 2001:61-62). Solstice ceremonies included representatives from the "Island Province", encompassing all northern islands (Hudson and Underhay 1978; Johnson 2001). The prevalence of aquatic features in Chumash rock art, and the importance of sea life in religious and ceremonial life, indicates the critical role that the

Chumash accorded both the Channel, and the islands themselves, in the cosmology of the universe (Bean and King 1973; Hudson and Conti 1981; Johnson 2001; Perry 2013).

Aside from the emphasis on maritime life and the context provided by the development of the ’antap specifically, the critical distinction between it and the kuksu society relates to the composition of the membership and the scope of members’ responsibilities. Members were apparently always high-status individuals (including chiefs, canoe-owners, and shamans). As with members of the kuksu, they collectively controlled access to ritual knowledge and secular power, as much as the two could be considered separately (Bean and King 1974; Blackburn 1974). The Chumash marked the transfer of hereditary status and the differentiation between commoners and elites by initiation into and membership in the society. Though not itself necessary for membership, members often owned at least one *tomol*, an important symbol of both status and wealth.

Master craftspeople (themselves specialists and members of a craft guild called the Brotherhood of the Tomol [Arnold and Munns 1994]) built these large, ocean-going sewn-plank watercraft from redwood that drifted down the coast to the northern islands (*Wima*, the name for Santa Rosa Island, means “driftwood” [Applegate 1975]). Individual ownership of the tomol and participation in the ’antap were critical ingredients for the development of complexity among the Chumash. These watercraft were not developed for bead transportation, but the operation of individual elites within the system favored that use as it became an effective solution to local problems of distribution (Arnold 1995). The Chumash case suggests that non-kin relationships among members of the ’antap (or a functionally similar predecessor organization) led to stronger connections among elites, who thereby gained a degree of control over the labor of others beyond their immediate kin networks as a function of their ability to facilitate connections among islanders and mainlanders in many directions (Arnold 2001a; Johnson 1988, 2001).

Whether in northern or southern California, there is a general pattern evident in these examples. People passed down some types of productive activities within kin groups, while membership in cross-cutting societies (e.g. kuksu or ’antap) operated outside of those bounds. This created a context in which most individuals made decisions about their own labor based at least partially on kin relationships, but others (often those of high-status) operated both within those bounds and beyond them as well. Ownership of access and control over distribution suggests a context for the institutionalization of labor relationships following from these overlapping social networks (Arnold 1987; Loeb 1926). As with the Enga, non-kin labor control among the Chumash developed as elites adapted their dual roles. For the Enga this resulted in the fusion of previously separate ritual systems, but for the Chumash this led to the ability of tomol owners (i.e. elites) to marshal the labor of increasingly large groups of increasingly unrelated individuals, both within kin-groups and among them.

Some Effects of Territoriality and Ownership on the Origin of Complexity

The operation of the societies and sociopolitical systems evident in these case studies required some form of control over knowledge, resources, and labor. Substantial differences in wealth and status characterized each of them as well. This differentiation lies at the root of sociopolitical complexity.

The Chumash controlled discrete territories by the 16th century when Europeans arrived. Their occupation of the landscape specifically reinforced this ownership. Midden formation, and the resultant visible mound, may have related to claims of territorial ownership. Work in the US southeast and in the Torres Straights highlights the importance of mound creation in this sense. An analysis of midden creation in the latter case suggests that the location and construction of middens went beyond convenient discard (McNiven 2013). Unlike many famous earthen mounds found in the southeast which were built in distinct episodes, often tied to ritual participation, however, these middens were not built specifically as monuments (McNiven 2013). Despite this, their locations referenced the landscape, prior use of the sites, and the connections between groups and midden mounds at various points along the coast (McNiven 2013). Such evaluations of midden production and deposition have begun to work their way into discussions of site permanence and visibility on the landscape in California (Gamble 2017), although significant theoretical work remains to be done. Regardless, territorial ownership was a key component of Chumash landscape use by the second millennium AD. The specific mechanism by which use of landscape (and resource patches in specific territories) developed around changing settlement patterns in the Late period is a topic of debate. Some emphasize exclusionary control over resources, hypothesizing that the concentration of ritual power and specialist knowledge itself conditioned resource access (Arnold 2001a). Others suggest that intra-island connections on SCRI, and between SCRI, SRI, and the mainland, were the context for differential access and that exclusion or ownership specifically was not a necessary factor in these developments (Perry and Delaney-Rivera 2011; Perry and Glassow 2015).

Ownership of goods and resources was the foundation of the bead industry on the islands. The central feature underpinning that industry was control over the specialist knowledge of drill production. The relationships of individuals and communities across the islands conditioned access to specialist training, which itself then filtered access to raw materials necessary for the production and enactment of that knowledge. Other researchers suggest that this was necessary for complexity generally. Bowles and Choi model the emergence of property regimes and the adoption of farming at the beginning of the Holocene, arguing that the development of property rights in the context of conditions favorable for agriculture led down the path to sedentary agricultural lifestyles (Bowles and Choi 2013). Bettinger presents a similar case for California specifically. He suggests that private property developed because of a shift to labor-intensive plant processing in the wake of the introduction of the bow and arrow (Bettinger 2015). Ownership in this sense is not strictly necessary for the development of the bead production industry seen in the Late period, however. Models that focus on transportation costs and proximity to important centers of distribution explain why certain quarries were exploited for microblade production while others were not (Perry and Jazwa 2010). This explanatory framework has the advantage of providing a causal mechanism for quarrying activity and the development of microblade production, without requiring specific, culturally contextualized notions of exclusionary ownership. Coastal settlement, intra-island transportation, and the connections among sites and their environments set the context for developing specialization, whatever the emic understanding of resource use among the Island Chumash of the Late period may have been (Arnold 2001a; Perry and Delaney-Rivera 2011; Perry and Jazwa 2011). Expanding ownership of or control over the products of another's labor set the stage for the development of sociopolitical complexity, even if that ownership was not initially permanent, was predicated on settlement proximity or transportation, or was restricted by kinship ties (e.g. seen in classic "Big Man" societies [Sahlins 1963]).

EXPANDING LABOR CONTROL AS A MECHANISM FOR SOCIOPOLITICAL CHANGE

The extension of labor control beyond the bounds of kinship is difficult to establish in any given archaeological case. Appropriate evidence must first be identified to understand the importance of labor in ritual change or sociopolitical evolution (see Bayman & Moniz-Nakamura 2001; Cannon 2011). The most direct type of archaeological data comprises our understandings of the various forces underlying a given society's system of labor organization, which can be inferred from material remains contextualized within social systems and based on comparison of data generated from those remains (Costin 1991). These data are especially useful for understanding sociopolitical evolution when systems of labor organization themselves change through time in dialogue with other, more ephemeral sociopolitical structures (Arnold 1993; Costin 1991; Gosden 1989; Prentiss et al. 2014; Schortman and Urban 1992). This understanding requires that archaeologists explicitly acknowledge the relationship between individuals and the technologies they made and used through time.

Technological innovation has long been treated as a primary driver of change in the organization of production itself, as well as in society generally (e.g., Childe 1936; Marx 1867/1994; Morgan 1877; White 1949). Common-sense arguments about change through time and comparisons among groups are often at the root of their arguments about distinct kinds of technologies and the relative complexity in the invention, development, and maintenance thereof. These arguments elide the role of human agents in the process of making and using new technology. As many scholars have argued, this does not actively reflect the operation of actual human societies through time (Carballo et al. 2014; Childe 1951; Costin 1991; Hayden 2001; Sahlins and Service 1960; Service 1962; Stanish 2017). On the northern Channel Islands, technological change was an avenue by which cultural evolution operated, not its precondition.

Changing patterns of consumption (both in craft and subsistence goods) are evident in the archaeological record of the region. The data suggest that increasing non-kin labor control drove change as individuals participated in the developing bead industry with increasing intensity (Arnold 1996a). The reification of the social relations of production within the objects themselves was another critical component of this change, linking social power and prestige to objects (i.e. commodity fetishism [Marx 1867/1994]). The impact of this change can be seen in the relative prestige of specialist producers at sites like *Lu'upsh* (SCRI-306, China Harbor), where household status appears to correspond to microblade production skill (Dietler 2003).

This pattern was not only seen among the Chumash. Adze production on Hawai'i was a ritual activity that took on similar attributes through time (Bayman & Moniz-Nakamura 2001). The manufacture of adzes occurred generally at relatively low intensity and in association with food procurement. Evidence from the main quarry of Mauna Kea, by contrast, suggests that production there was controlled and specialized, linked with the ritual production of adzes as symbols as well as tools (Bayman & Moniz-Nakamura 2001). The nature of the production locales (accessible vs. inaccessible, single-purpose vs. multi-purpose) hints that those working in the quarry did so for reasons beyond the simple manufacture of stone tools. The use of chert on the northern Channel Islands suggests similar dynamics through time, with the attendant social value that this implies (Arnold 2001a; Perry and Jazwa 2010; Perry and Delaney-Rivera 2011; Pletka 2001a). These tools, especially formal microdrills of the second millennium AD, were not simply tools. They were symbolic of relationships among islanders. Changes in the distribution and use of chert over the last two millennia in the region suggests that its value in this sense was more important to distribution and use than its material quality alone would suggest. Furthermore, this occurred in the context of the invention of the tomol and the development of the ’antap. In combination these features of Chumash society in the first millennium AD led to the development of sociopolitical complexity.

OWNERSHIP, LABOR, AND LITHIC TECHNOLOGY

Connecting the threads of resource ownership and labor control with the use of toolstone on SCRI requires a detailed analysis of lithic technology through time. Due to the durable nature of its production detritus, lithic analysis has played a central role in understanding labor investment for much of the history of archaeology. From the beginning, archaeologists sought to link tool production to the activities they implicitly recorded.

The early American lithicist W.H. Holmes focused on this question in his study of quarry sites. His work at the Piney Branch site outside of Washington D.C. focused on understanding how reduction sequences at quarries led to the discard of objects that appeared to be Paleolithic in nature, as he worked to reject hypotheses about the extreme antiquity of humans in the New World (Holmes 1890). In the intervening century, New World archaeologists have pursued questions about the organization of lithic technology with vigor (e.g. Andrefsky 2008; Bamforth 1991; Binford 1980; Bradbury and Carr 1999; Hayden et al. 1996; Magne 1985; Odell 2003; Sackett 1985; Shafer and Hester 1991; Shott 1986; Whittaker 1984; Yerkes 1987). Much of this work dates to the latter half of the twentieth century, when increased focus on quantification and statistical analysis became the center of archaeological analysis of lithic assemblages after the advent of processual archaeology. The underlying arguments about the organization of labor, however, are much older. Holmes implicitly recognized these ideas in his reduction sequence studies and in his later work on lithics across North America. Unfortunately, he did not follow the threads of labor organization suggested in his early work on quarries to their conclusion and missed the opportunity to address the organization of production (Holmes 1894, 1919).

On the northern Channel Islands, the increasing importance of specialized bead production, and the attendant concentration of high-quality chert to drill-makers on the east side of the island, led to profound innovation in the organization of technology there (Arnold 2001a; Perry and Jazwa 2010). In earlier periods producers focused primarily on whatever toolstone was readily available, applying a similar set of techniques whether they were working with chert or another material (Perry and Jazwa 2010). The organization of production, seen through the lens of lithic technology, indicates both tightening control over the raw materials and increasing participation in island-wide production systems at the expense of local ones over the first millennium AD (Arnold 2001a; Perry and Jazwa 2010). In this context I discuss the local history of SCRI and Laguna Canyon (Ch. 3) and present my analysis of the lithic assemblage (Ch. 4).

CHAPTER 3 – CULTURAL EVOLUTION IN THE SANTA BARBARA CHANNEL REGION

Technological innovation, settlement pattern change, environmental fluctuation, ritual system renegotiation, and an upheaval in the social relations of production were features of Chumash history over the first millennium AD. The Late period pattern developed out of this flux in the region. I evaluate an assemblage drawn from Laguna Canyon, located on the south side of SCRI, that dates primarily to the late Middle and Transitional periods (though highly disturbed components at one site yielded Late and Historic period materials [see Table 1 for the ranges of these periods]). This specific interval captures changes in the organization of lithic production necessary to assess the development of complexity in the region. This period also illustrates the pace of change, a topic of continuing discussion for researchers studying the Santa Barbara Channel.

TABLE 1

ARCHAEOLOGICAL PERIODS ON SCRI[1]

Period	Age (BC/AD)	Age (BP)
Early	2500 – 600 B.C.	4450 – 2550 BP
early Middle	600 B.C. – 600 A.D.	2550 – 1350 BP
late Middle	600 – 1150 A.D.	1350 – 800 BP
Transitional	1150 – 1300 A. D.	800 – 650 BP
Late	1300 – 1782 A.D.	650 – 168 BP
Historic	1782 A.D. – Present	168 BP – Present
Middle Holocene	4500 – 1500 B.C.	6450 – 3450 BP
Late Holocene	1500 B.C. – Present	3450 BP – Present

[1]Adapted from: Arnold 2001a and Kennett 2005

There are arguments for a long-term and short-term trajectory for the development of complexity in the region. Increasing differentiation among individuals from the Middle period onward suggests to some scholars that complex society arose relatively early and grew slowly but reliably larger through time (Gamble 2008; King 1990). The strongest evidence for this argument derives from mortuary contexts, which track changes in heritable status through time and shifting patterns of finished goods. The deposition of those goods in funerary contexts from the middle of the Early period through much of the Middle period suggests increasing emphasis on heritable status. Why these patterns should primarily reflect this dynamic, rather than historical variations of burial practice and associated rituals, remains unresolved. Those favoring the second position point to the apparently unprecedented conditions of the early second millennium AD, and the sudden appearance of many interconnected features of the Late period pattern during the Transitional period, as evidence for a punctuated change (Arnold 2001; Arnold and Munns 1994). Still others have suggested a blended approach that combines both, recognizing the limitations of the archaeological record in certain periods and at certain resolutions (e.g. Erlandson and Rick 2002; Kennett 2005). Considering both these arguments and the data I present below, I believe that the preponderance of evidence supports a period of relatively rapid sociopolitical development specifically beginning in the middle of the first millennium AD, leading to the complex sociopolitical structure evident in both ethnohistoric accounts and in the archaeological record of the second millennium AD (Arnold 2001; Erlandson and Rick 2002; Kennett 2005). Increasing specialization, especially in the standardization of production, attests to the critical role of labor investment in differentiating the development of complexity in the Transitional period from earlier ritual elaboration in the Early period. Though status differentiation undoubtedly developed long before the first millennium AD, evident in the pattern of lithic production as early as the middle Holocene that formed the context for the development of Middle and Late period chert use (Perry and Jazwa 2010), the archaeological record suggests that complexity arose during the late Middle period.

Resource Use on SCRI

Despite the rapid changes of the late Middle and Transitional periods, the extreme time depth of sites on the northern Channel Islands reveals significant cultural continuity there for more than ten millennia. Labor and subsistence practices before the late Middle period were generally stable, slowly increasing in intensity through time (Glassow 1997; Kennett 2005). Low-intensity, non-specialized production throughout the channel region characterizes the Early period (Arnold 2001b; Kennett 2005). The greatest transition in labor investment, however, began in the late first millennium AD, marked off from the preceding era by differential access to raw materials, especially shells and chert, connected to the developing bead industry (Arnold 2001b; Perry and Jazwa 2010). One important marker for this shift was the development of a new bead type made from the callus of the shell, rather than the wall.

Working the callus required technological innovations in processing (Arnold 2001b; Arnold and Graesch 2001; Pletka 2004), in chert microdrill manufacturing (Perry and Jazwa 2010; Preziosi 2001), and in the simultaneous and interrelated development of labor practices in both industries (Arnold 2001b, 2001c; Arnold and Graesch 2001, 2004; Arnold and Munns 1994; Graesch 2004; Nigra and Arnold 2013). Another critical indicator of the increasing specialization of island bead production was the standardization characteristic of bead manufacture. The uniformity of material inputs (in the form of standardized drills and bead blanks) and the clearly defined manufacturing process (from blank, through bead-in-production [hereafter referred to as BIPs], to finished beads) resulting in highly standardized final products is characteristic of specialized production (Arnold 1996a, 2001c; Costin 1991). Reorganization of the bead production industry resulted in increased control over resource access. Islanders made drills at major quarry sites, and raw materials (i.e. cores) increasingly remained at villages on the eastern end of the island as the microdrill industry intensified over time (Arnold 1987; Arnold et al. 2001; Preziosi 2001; Perry and Jazwa 2010).

Subsistence practices in the Santa Barbara Channel developed along different lines throughout the Holocene in response to trends in human-environment interactions and to climate change (Erlandson et al. 2009), but at the most basic level the Chumash were maritime hunter-gatherers with a broad subsistence base. They incorporated a diverse mix of resources drawn from both the sea and, to lesser degree, from the land. Though changes through time in these practices were profound, they did not undergo any discernable period of rapid change analogous to the development of the bead industry. Beginning from an understanding of subsistence resources, however, is necessary to address underlying changes in other productive systems.

Terrestrial plant resources included chia (*Salvia columbariae*), sage (*Salvia sp.*), acorns (derived from numerous species of oak, *Quercus spp.*), blue dick (*Dichelostemma capitatum)*, willow for construction material (*Salix spp.*), various grasses and shrubs (used for cordage and thatch, examples include sumac [*Rhus trilobata*], rushes [*Juncus spp.*], and dogbane [*Apocynum cannabinum*]), reeds [both tule {*Scirpus acutus*} and cattail {*Typha angustifolia*}], and especially datura (*Datura wrightii*) for its medicinal and ritual uses (Gill 2014; Martin and Popper 2001; Timbrook 2007). These species were managed through a combination of seasonal burning and control of wild seeds, requiring highly developed knowledge of the local environment, especially of the succession of plant communities after fire (Timbrook et al. 1982). While access to these resources was limited compared to those living only a few miles across the channel, islanders had local access to even fewer terrestrial animals. The Chumash likely brought with them the largest terrestrial mammal on the islands, the island fox (*Urocyon littoralis*) in the

Middle Holocene (Rick et al. 2005). Otherwise, islanders relied on a range of bird species, whose bones are frequently recovered in modified form as whistles and flutes in Middle period assemblages (Colten 2001; Wake 2001). The availability of terrestrial foods on the islands and the degree to which islanders relied on specific species has been a source of debate in the region, especially with respect to plant use (e.g., see Arnold and Martin 2014; Gill 2013; Gill and Hoppa 2016; Hoppa 2014; Martin and Popper 2001). Researchers have long hypothesized that the smaller size and therefore the suitable land area of the islands meant that such resources were generally less abundant there compared to the mainland coast, especially during times of drought. Ethnohistoric accounts are generally silent about islander plant use (with a small number of notable exceptions), leaving substantial room for future analysis of archaeobotanical assemblages to contribute to our understanding of regional food procurement patterns (Gill 2013).

Marine resources, the other pillar of diet on the islands, included various species of bony fishes associated with a variety of marine habitats (e.g., cabezon [*Scorpaenichthys marmoratus*], kelp bass [*Paralabrax clathratus*], rockfishes [*Sebastes spp.*], wrasses [sheephead {*Semicossyphus pulcher*} and señorita {*Oxyjulis californica*}], surfperch [Embiotocidae], etc.) and cartilaginous fishes (dogfishes, sharks, and rays) alongside shellfish (e.g., red abalone [*Haliotis rufescens*], black abalone [*Haliotis cracherodii*], snails [*Megastraea undosa* and *Tegula funebralis*], Pismo clam [*Tivela stultorum*], and the omnipresent California mussel [*Mytilus californianus*]) (Glassow and Joslin 2012; Colten 2001; Glassow et al. 2008; Jazwa et al. 2012; Perry and Hoppa 2012; Rick 2007). Prior to the first millennium AD, islanders collected shellfish in littoral habitats and focused fishing activity in rocky nearshore and kelp bed habitats. One critical pattern evident by this period was the increase in pelagic species connected to more intensive offshore fishing (Rick et al. 2005). On SCRI specifically, researchers have found that the most significant increase occurred during the Transitional period (Pletka 2001b). Marine mammals, populations of which have rebounded on the islands after overhunting that lasted into the early 20th century, were also an important source of food and raw materials, though evidence suggests that hunting of these animals did not undergo the same long-term changes seen in the use of marine species through time (Colten and Arnold 1998; Kennett 2005; Rick et al. 2005; Wake 2001).

The Island Chumash utilized the resources of the sea for more than food. Seagrass cordage has been reported at sites dating from the Early Holocene until the Late period, suggesting the importance of the marine environment for more than simply food procurement (Martin and Popper 2001). The use of non-food shell for a variety of purposes is itself another example of such production (Arnold 2001c; King 1990). Exploiting marine resources depended on access to a variety of nearshore marine habitats, to sandy and rocky beaches, and to intertidal and subtidal zones. Boat technology provided an ideal means to travel between such zones and to exploit marine species out of the range of fishing or shore collection, and the everyday use of watercraft (often assumed to be like ethnographically observed tule reed balsas) was critical to life in the channel (Arnold 2001a; Hudson et al. 1978). By the late Middle period, islanders were intensively fishing intertidal, nearshore, and midwater habitats (Pletka 2001b). These watercraft existed as a critical component of Chumash lifeways (Arnold 2001; Bernard 2004; Cassidy et al. 2004; Rick et al. 2001). Any travel to the islands, at any point in prehistory, required such vessels. Even during the lowest sea levels of the last glacial maximum, when all four of the northern islands were connected into a single mass (called Santarosae), there was never a land connection to the mainland (Orr 1968).

The long-term changes in maritime subsistence activities on the northern Channel Islands have been well documented by work on the northern islands (Braje et al. 2007; Glassow 1993; Rick et al. 2001; Rick et al. 2005; Vellanoweth et al. 2003). Evidence for permanent occupation as early as ~12kya on San Miguel and Santa Rosa Islands includes stone tools and a faunal assemblage indicating a diverse resource base, composed of vertebrate fish, birds, and marine mammals (Erlandson et al. 2011; Jazwa et al. 2017; Jew et al. 2013a). Researchers studying changes in food procurement patterns through time have demonstrated an increasing reliance on vertebrate fish species coupled with an overall increase in diet breadth (Braje et al. 2007; Jazwa et al. 2012; Kennett and Kennett 2000; Kennett 2005; Rick et al. 2001; Rick et al. 2005).

Increased reliance on fish required increased labor investment in subsistence practices. Tackle (and its maintenance) is often labor-intensive, whether for fishing by net, line, or spear. Fishing nets require a greater investment of labor to yield similar food returns when compared to line fishing, and researchers have addressed potential specialization within fishing practices. Extensive faunal analysis from SCRI and the mainland coast suggest that net fishing increased through time from the Middle to Late periods, with more emphasis on net fishing suggested for the mainland (Pletka 2001b). Pletka interprets this to suggest that the distribution of sandy beaches and species taken more frequently by net than by line fishing is favorable on the mainland compared to the islands, and the possibility of more direct access to plant fibers used in net production may have further encouraged their use on the mainland coast. Some sites on SCRI (e.g., SCRI-191) with appropriate conditions may have seen some increase in net fishing, but islanders largely focused on line fishing instead (Pletka 2001b). During the late Middle period, islanders focused on nearshore and midwater species that could be taken by line with the use of small watercraft (Pletka 2001b).

Some researchers draw connections between the development of the sewn-plank redwood tomol and increased fishing of large pelagic species in later periods (Bernard 2004; Pletka 2001b; Rick et al. 2005). Current evidence suggests the tomol was a uniquely Chumash invention of the first half of the first millennium AD (Arnold 2007; Arnold and Bernard 2005; Gamble 2002). Evidence for tomol use beginning in this period from three sources: the density of faunal remains of aggressive, large-bodied pelagic fish (e.g. *Xiphias sp.*) increased over this span, likely tied to prestige competition (Arnold and Bernard 2005; Bernard 2004; Pletka 2001b); the shift toward occupational patterns favoring sites convenient for travel by water (Perry and Glassow 2015); and burial contexts during this span that yield the earliest known tomol parts in regional assemblages (Gamble 2002).

It is important to note here that in the Middle and Transitional periods subsistence could have been an arena for the development of specialization, all things being equal with bead production. Pletka (2001b) has suggested that fishing did not become specialized as bead making had because the combination of local environments and the social relations of production did not favor fishing as a specialization on the islands. Fishing, like lithic use in Laguna (addressed below), composed part of the productive activity of islanders in the latter Middle period, however in this context specialized fishing specifically as a strategy was not favored (Pletka 2001b). Other researchers have observed similar patterns, with very limited distributions, in earlier periods. On San Miguel Island, work conducted on abalone middens demonstrates that subsistence practices varied through time, but that unlike the development of the bead industry (discussed below) those changes in labor allocation were neither permanent nor indicative of increasing complexity (Braje and Erlandson 2007). Comparing a Middle Holocene red abalone midden (SMI-557) to a Historic period Chinese black abalone fishing camp, they identify a broader range of faunal remains at the former, suggesting lower intensity of abalone exploitation there relative to the later specialized resource-extraction locale (Braje and Erlandson 2007). When compared to abalone exploitation at other Chumash sites, however, the degree of reliance on abalone at SMI-557 demonstrates that labor focused on subsistence tasks was not a monolithic system. At sites on SCRI and elsewhere, red abalone composes between 1% and 21% of middens (Braje and Erlandson 2007; Glassow et al. 2008). While labor investment at SMI-557 focused on a narrow range of subsistence activities, this demonstrates that prior to the late Middle period these dynamics are best interpreted with respect to local conditions and not to broader changes in labor organization (Perry 2004).

The pattern over much of the Holocene suggests a slow intensification of subsistence over time in response to local contingencies and technologies on the islands, shifting from shellfish to vertebrate fish as local resources became depressed and increasing labor investment was necessary to guarantee yields. Dramatic increases in intensity and specialization of craft production at the end of the Middle period are therefore unique when compared to this record of subsistence practices. The connection between these patterns in Laguna in the late Middle period is critical for evaluating earlier patterns of labor organization and the lack of clear subsistence specialization that persisted beyond the Transitional period.

SPECIALIZED LABOR AND RESOURCE USE ON THE CHANNEL ISLANDS

Island Chumash labor organization changed most significantly from the Middle to the Late Periods (Arnold 1996a, 2001; Perry 2004; Perry and Jazwa 2010). Over this span islanders increasingly concentrated their labor on the high-intensity production of both shell beads and chert microdrills (Arnold 1990, 2000). The trajectory of these changes was not direct, despite the clarity implied because of the regional archaeological emphasis on bead-making. Much of the existing scholarship in the region focuses on the relatively small amount of high-quality toolstone available and the impact of that availability in patterns of craft production. Scholars involved in this research often emphasize specialized and formal production (e.g. Arnold 2001a; Glassow et al. 2008; Jew et al. 2013; Perry and Jazwa 2010; Pletka 2001a). The northern Channel Islands are a perfect case study for such an analysis, which I seek to contextualize in this project by exploring variations in local and non-local toolstone use. Other researchers have addressed this context as well, specifically in discussions of material use in island interiors (Perry and Delaney-Rivera 2011).

Before the first millennium AD, high-quality cryptocrystalline materials are most visible in the form of bifaces and associated production detritus (Erlandson et al. 2011; Jew et al. 2013b). This pattern of use is generally stable across much of the Holocene until specialized microdrill production arose on SCRI by the Late period. Use of chert for formal tools of all types, however, rested atop an assemblage characterized by intensive use of low-quality local toolstone (variable among island and mainland locales) (Perry and Jazwa 2010). Jew et al. (2013b) hypothesize that formal tool production declined from the end of the Pleistocene through the Early and Middle Holocene because of changing environments associated with sea level rise and increased reliance on shellfish collection rather than hunting. Whether or not this hypothesis is eventually borne out as more sites are identified and the use of lithic resources becomes clearer, I believe that the underlying argument is strong.

On the islands generally, cherts deriving from the Monterey formation dominate the cryptocrystalline assemblage from the first arrival of humans (Jew et al. 2013b), but each island

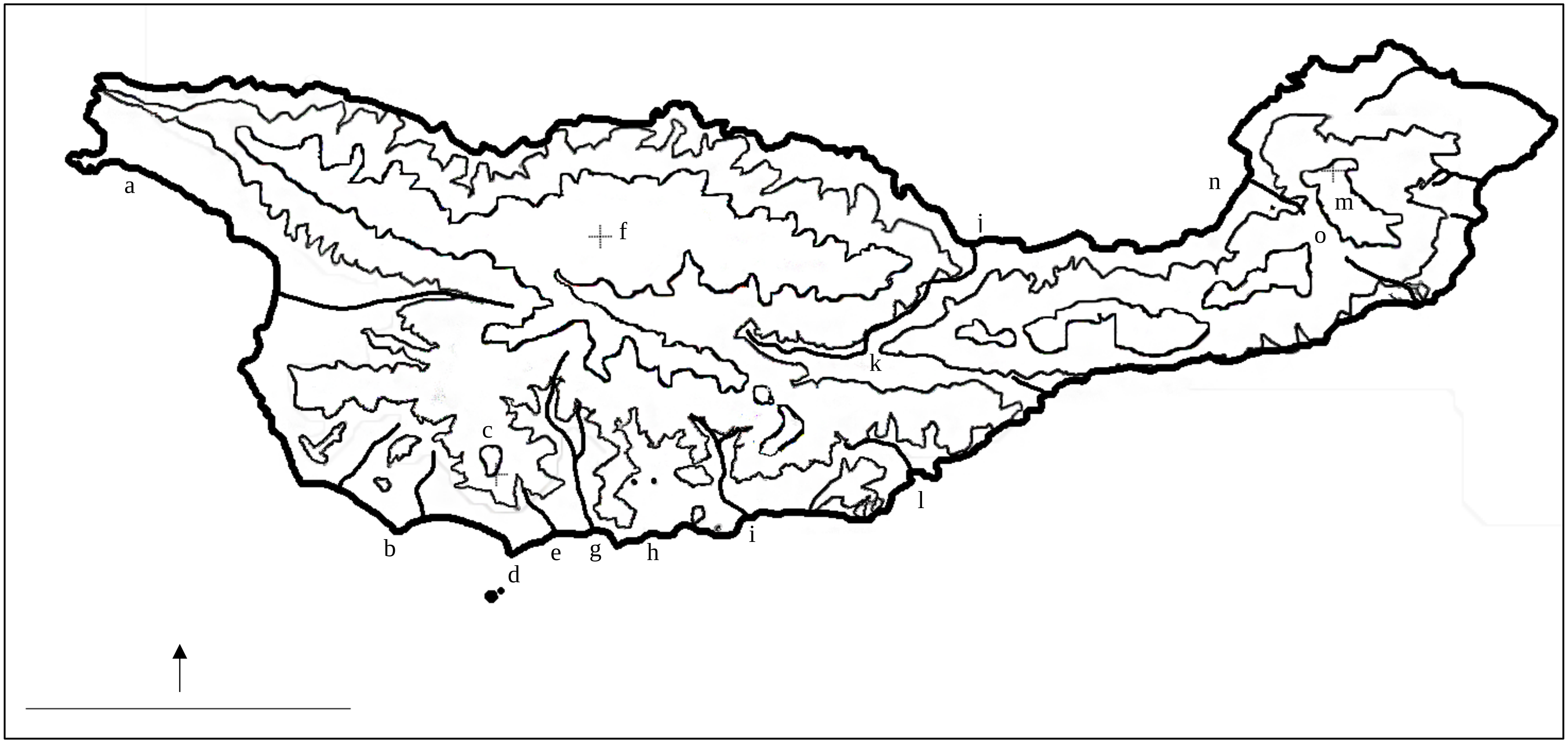

FIGURE 1B: MAP OF SANTA CRUZ ISLAND WITH MAJOR SITES DISCUSSED IN THE TEXT LABELED (CONTOUR LINES @ 200M; SCALE = 8.25KM)

(a) L'akayamu (SCRI-330); (b) Shawa (SCRI-192); (c) Sierra Blanca; (d) Punta Arena; (e) Malva Real; (f) Diablo Peak; (g) Laguna canyon; (h) Alamos Anchorage; (i) Willows; (j) Xaxas (SCRI-240); (k) Cañada del Puerto; (l) Liyam (SCRI-1); (m) El Montañon; (n) Lu'upsh (SCRI-306); (o) Contact zone quarry sites (e.g. SCRI-93) has its own local materials characterized by a cluster of different types of toolstone. On Santa Rosa these are primarily quartzites and knappable silicified sedimentary materials as well as local "Wima" chert (Erlandson et al. 2012). On San Miguel they are "Tuqan" chert and chalcedonic "Cico" chert (Erlandson et al. 1997; Erlandson et al. 2008). Wima and Cico cherts are characteristically found as stream-worn cobbles, while Tuqan chert can be found in somewhat larger quantities at Cardwell Bluffs (Erlandson et al. 2008). These sources are limited by comparison to those available on SCRI. The northern SCRI volcanics (see Weaver 1969) yield igneous materials. The salic materials relevant for tool production possess a range of textures from porphyritic rhyolites to aphanitic meta-igneous stone (possibly dacites), present in abundance relative to chert in Laguna (see Ch. 4) and some Central Valley sites such as SCRI-801, SCRI-183, and SCRI-194 (Perry and Delaney-Rivera 2011). The east end contact zone of SCRI contains substantial outcrops of "Island" chert, extensively quarried in prehistory (see Figure 1b). This chert is characteristically found in relatively thin, laminar beds of high quality material interspersed with lower quality chert, limestone, and shale (e.g., Arnold 2001b; Perry 2003, 2004; Perry and Jazwa 2010). These outcrops represent the largest, most stable, and most important lithic resources on the northern islands. The quality and reliability of the east end chert surpasses all other island sources (Perry and Jazwa 2010). Laguna Canyon, a distant 20km overland from the nearest quarry sites (see Figure 1b), likely had little direct access to these resources, especially evident in the material of Transitional period age addressed below (see also Glassow et al. 2008 for a discussion of this intra-island dynamic at play at Punta Arena, west of Laguna). This likely reflects increasingly maritime connections among sites on SCRI (see discussion below), a change which would have had an impact on the access of those living in Laguna to larger chert cores.

Ongoing work on chert sourcing will likely yield important results with respect to the circulation and distribution of these materials, especially the role of chert in formal tool production and social system maintenance over long periods on SCRI, among the islands, and between islands and mainland (definitively attested in the Late period, see Arnold 2001b; Pletka 2001a; Perry and Jazwa 2010). Through time, islanders' decisions about local environments and tool needs conditioned production patterns and, with the exception of formal tools of the Late period, led to an emphasis on ad-hoc production at the expense of more formal tools.

The emphasis on chert dates to the earliest semi-systematic work in the region, with roots in even earlier looting (Rogers 1926). Researchers have built on this focus in tracking the development of the specialized drill industry and the use of chert at east end quarries (Arnold 1987; Perry and Jazwa 2010). Through the Middle Period, chert was available for a variety of utilitarian purposes across SCRI (Perry and Glassow 2015). Biface production, for example, was common at specific quarries on the east end: SCRI-611 located south of Scorpion Anchorage and utilized from the middle Holocene through the Middle and Transitional periods; and SCRI-724 a dense shell midden located adjacent to SCRI-611 and utilized in the middle Holocene (Perry and Jazwa 2010). One important result of this pattern is their recognition of changing patterns of quarry use from the middle Holocene through the Late period, with quarry materials from middle Holocene sites serving as a source of available raw materials for Middle and Late period microblade producers (Perry 2003; Perry and Jazwa 2010:189). The association of middle Holocene habitations with much later quarrying activity supports this interpretation and suggests that during the late Middle period microblade producers who increasingly lived at coastal sites (rather than inland quarry sites) emphasized nearby resources rather than those of the highest quality (Perry and Glassow 2015; Perry and Jazwa 2010). The Laguna assemblage of the late

Middle period suggests that similar settlement dynamics shaped tool production there (discussed below).

As the microblade industry developed in this context, a small portion of the east end of the island ultimately produced most of the finished chert tools utilized on SCRI and SRI during the Late Period (Arnold 1987; Perry and Jazwa 2010). By the Late Period at Lu’upsh, for example, a single cubic meter of excavated material could yield 5,000 microblade cores and more than 20,000 microblades (Arnold 1990; Dietler 2003). Producers relied on these critical quarry sites (Arnold 1987; Perry and Jazwa 2010). In addition to these changes, the production of the drills underwent a process of refinement and standardization, resulting in a new type of dorsally retouched microdrill during the Late Period (Arnold 1990, 2001a; Preziosi 2001). Intra-site variation in the intensity of specialized drill production at Lu’upsh further suggests that status distinctions among households correlate with different levels of skill and/or specialist knowledge related to drill production (Dietler 2003).

These diverse lines of evidence provide direct support for intensive craft production focused on microblades that developed from the late Middle through Late periods. This demonstrates a change in labor organization emphasizing increased intensity alongside regional concentration of production, both quantitatively and qualitatively different than the previous labor regime. New institutions in the social relations of production drove sociopolitical evolution in the Santa Barbara Channel region over this span, underwritten by connected developments in resource use, settlement dynamics, and the productive activities of individuals across SCRI, the northern islands, and the mainland alike (Arnold 1990, 1996a; Braje and Erlandson 2007; Hollimon 2004; Perry and Glassow 2015). Unlike investigations of bead-making and microdrill production, however, little work has been conducted to understand how island-wide patterns affected places like Laguna Canyon, which were never a central part of the developing industry.

Island Life in the Middle Period

These long-term changes resulted in a general trend in the archaeological record through much of prehistory before the first millennium AD: relatively stable increases in site density in the region, the introduction and spread of characteristic artifacts (e.g. shell fishhooks and callus beads), and the intensification of maritime resources (Kennett 2005; Perry and Glassow 2015). The early Middle period does not appear to depart from this pattern. Generally, over the Middle Holocene archaeological evidence suggests distributed settlement on SCRI, including large numbers of interior sites (Perry and Delaney-Rivera 2011; Perry and Glassow 2015). The major middle Holocene site at Punta Arena was only 4.3km west of Laguna along the coast, and landscape use in and around Malva Real (the largest drainage located between Punta Arena and Laguna) likely reflects similar patterns of settlement (Glassow et al. 2008). The early portion of the Late Holocene (i.e. the late Middle period) saw a continuation of these trends. After the seventh century AD, however, occupation and landscape use shifted dramatically (Arnold 2001; Gamble 2011; Kennett 2005; Perry and Glassow 2015).

Islander landscape use during the Late period on SCRI emphasized large, permanent coastal villages consistent with increasing reliance on marine resources (Kennett 2005; Perry and Glassow 2015). These authors suggest that the middle Holocene settlement system of the east end focused on central place foraging, including at interior sites, while during the late Holocene islanders lived near the coast and primarily engaged in logistical forays into the interior (Perry 2004; Perry and Glassow 2015). Similar patterns are evident on neighboring SRI (Kennett 2005;

Orr 1968). In this context, terrestrial pathways took on new significance as links between coastal villages. Settlement patterns over the first millennium AD support this interpretation for continuing interior occupation only at some locales (Perry and Delaney-Rivera 2011, Perry and Glassow 2015). By the point of ethnohistoric contact, islanders lived in eight named villages on SRI, one on SMI, and ten on SCRI (Johnson 1993). On SCRI, the historic village closest to Laguna Canyon on the south side of the island was *Liyam*, reported as the home of the island princess and an important site in ethnohistoric accounts (Arnold 1990; Librado and Harrington 1977). Most Historic period sites are located at the coast, at the mouths of drainages that empty north of the Central Valley, on the west, north, and east sides of the island (Arnold 1990; Johnson 1993). Only Liyam and *Shawa* (SCRI-192, Morse Point, 5km west of Laguna along the coast), were located on the south side.

Those living at Liyam had notable connections to other areas of SCRI and to other islands (Johnson 1993). Historically attested marriage ties linked Liyam to those living at the major site of *L'akayamu* (SCRI-330) on the west end (Perry and Delaney-Rivera 2011). Liyam, as one of the central sites on the island itself, may have been important in connecting intra- and inter-island communities from SCRI, SRI, and SMI, while other sites (e.g. *Xaxas* or *Swaxɨl*) emphasized island-mainland contacts because of their favorable locations for cross-channel travel (Perry and Delaney-Rivera 2011:119). Major sites like Liyam and Xaxas (SCRI-240, Prisoner's Harbor) contain abundant evidence for ritual activity and 'antap participation, a wide range of prestige goods, and diverse subsistence remains (Arnold 2001a; Perry 2013; Peterson 1994). Xaxas (12km due northeast from Laguna) was a nexus for intra-island trade and a point of connection to the mainland (Arnold 2001a; Perry and Delaney-Rivera 2011). It is perhaps the most dense and diverse extant archaeological site on SCRI, whereas Laguna contains a very limited diversity of artifacts. Where the islanders living at Xaxas could access the resilient perennial stream that reaches Prisoner's Harbor via Cañada del Puerto and occupied a favorable location for both intra- and inter-island travel (Perry and Delaney-Rivera 2011), those in Laguna were not so lucky. During the 2012-2017 drought, for example, surface freshwater was unavailable in Laguna during (at least) the summer months from 2013 onward. The relative health of the marshy area near the mouth of the canyon, however, suggests that subterranean freshwater may have still been present, possibly accessible via the use of weighted digging sticks. Additionally, no clear springs or freshwater sources were identified inland during survey further inland. Freshwater access is an important correlate for interior settlement elsewhere on SCRI, and its absence in Laguna is notable (Kennett 2005; Perry and Glassow 2015; Peterson 1994). With freshwater availability and occupational history in mind, Coches Prietos appears to be the most relevant comparative example due to its archaeological similarities and relative proximity to Laguna.

The settlement dynamics of Coches Prietos most directly parallel those of Laguna itself. Occupation there spanned much more than the Middle period based on radiocarbon dates, but significantly changed prior to the beginning of the Transitional period (Peterson 1994). Site density increased in the drainage, and those living in the canyon reoriented themselves around the large coastal village (presumably the direct antecedent to Liyam). Proximity to fresh water appears to characterize the use of small sites at favorable locations throughout the canyon, including in small rock shelters. Many of these sites were likely relatively temporary based on their reported density, considering the lack of other available seasonality indicators (e.g. oxygen isotope or assemblage faunal analysis) (Kennett 2005; Peterson 1994). Overall, this pattern suggests that Coches Prietos was more intensively occupied after the Middle period than in earlier periods, though that occupation focused on the major coastal village (Peterson 1994). If freshwater availability was an important factor in the location of sites during this period, especially in the context of a regional terrestrial drought, then the Coches Prietos pattern may indicate both the location of freshwater sources and their long-term stability in that drainage (Peterson 1994). Travel among drainages may have been an important consideration in Coches Prietos during this period as well. The increasing coastal orientation of settlement in the Late period suggests new patterns of movement on the landscape that would have connected communities on SCRI (and on the other islands) in novel ways (Perry and Delaney-Rivera 2011; Perry and Glassow 2015). Bioarcheological data further suggest that increasing interpersonal violence and waterborne disease were characteristic of the latter half of the first millennium AD (Kennett et al. 2013; Lambert 1997). Declines in subsistence productivity requiring greater labor investment to overcome environmental degradation seem to have been an important feature of the context out of which the profound changes of the Transitional period grew (Arnold 2001; Kennett 2005). The terrestrial link between Liyam and Xaxas in the ethnohistoric period also supports the hypotehsis that these changes were not limited to individual drainages (Perry and Delaney-Rivera 2011). Instead, the change in settlement pattern in Coches Prietos may have been informed by a wide range of factors: shifting relationships among individuals living in different canyons; territorial, knowledge, or resource access rights situated in Late period coastal villages as the home of lineage heads or kin networks; increasing reliance on watercraft transportation after 1000 A.D.; and a contraction of settlement for mutual support. Coches Prietos is well-watered compared to other drainages, possessed favorable occupational conditions, and already hosted a large coastal village prior to the Late period. These features together likely encouraged individuals with ties to the area to return in times of difficulty and set the stage for aggregation there at the end of the Middle period.

In Posa Creek Canyon, conversely, the late Middle period and Transitional period saw first a change in site occupation and eventually the abandonment of a large and well-established coastal village. Until the late Middle period, those living in the canyon occupied SCRI-475 on the east bank of the mouth of the creek. As the occupation shifted to the west side, at SCRI-474, Posa Creek became an important locus of bead-making (Arnold 2001). Early non-standardized chert microdrills are found in abundance at SCRI-474, and bead production became an important craft activity there very early. Many of the features of the canyon appear favorable, like those of Coches Prietos, but that did not last. The occupants of Posa Creek moved elsewhere during the Transitional period (perhaps to SCRI-191 [Jeanne E. Arnold, personal communication]). If aggregation in specific drainages was the overarching pattern of this period of the island's history, then Posa Creek is simply the mirror of Coches Prietos. The former was a drainage that people left to move elsewhere. It simply happened to be one with a large coastal village, unlike many other abandoned drainages with more ephemeral occupations.

This shift has important consequences for the political economy of the late Middle period. Because all individuals could not have been equally closely related in the event of such population movements, kin-based sociopolitical structures would have been particularly susceptible to renegotiation as new groups, with ties of varying strength to their new homes, came into closer contact. Such a context is ripe for the development of non-kin control over labor and the development of sustained, hereditary leadership roles among elites because it strains preexisting power relationships and provides an opportunity for new systems to replace them if they better fit the adaptive cultural landscape. Control of ritual knowledge and inter- or intra-island connections by members of the ’antap may have more readily enabled elites to manage this transition even though individuals were not under their direct control (see Perry and Delaney-Rivera 2011 and the discussion in Ch. 2 above).

Physical proximity among islanders increased over this span, but this was not the only form of intensifying contact between distantly related (or unrelated) individuals. Islanders now occupied the same sites on a permanent basis rather than being distributed more widely on the landscape. It was not even the first cause to set these changes in motion. These events simply accelerated trends in the region that had begun centuries before, creating new context for change. In the mid-first millennium AD, tomol manufacture and ownership introduced new possibilities in terms of sociopolitical organization rooted in increasingly close contact and maritime travel within the region. This is reflected both in the settlement shifts that emphasize use of the coast and a renewed importance of specific terrestrial pathways in the Late period (Perry and Delaney-Rivera 2011). It was the actions of individuals making choices about settlement and in deciding how and where to allocate their labor in this context that drove the development of sociopolitical complexity directly.

While the dynamics of elite consumption and display began to change earlier in the Middle period, it is in the record of daily life that the origins of complex society are evident in this case. Patterns of raw material use changed according to the renegotiation of settlement systems, labor dynamics, and sociopolitical organization toward the end of the Middle period, feeding into the full development of the island bead industry. The use of labor investment to mitigate political and environmental shifts is a common theme in the interpretation of both microdrill and shell bead production on SCRI (Arnold and Graesch, 2004; Munns and Arnold 2002; Perry 2004). Laguna Canyon was only one small corner of the Chumash world swept up in these changes.

LAGUNA CANYON

Detailed analysis of households at bead- and drill-making sites, and comparisons among households at multiple sites, revealed differential rates of investment in the growing island bead industry (Arnold and Graesch 2004; Dietler 2003). Variation in lithic and shell artifact types and densities between Laguna Canyon and other nearby sites/drainages indicates a complex interplay of elites and local communities as a more-tightly integrated sociopolitical economy developed for the first time in the Santa Barbara Channel region. This was especially true in Laguna, where islanders engaged with local resources in different ways than those living in major nearby villages during this period. They participated very little in bead production, instead continuing to focus on using local resources. This pattern has parallels to some late Middle period producers elsewhere (Perry 2004; Perry and Jazwa 2010). Despite the persistence of late Middle period production systems, however, it would be incorrect to assess Laguna as a place of stasis on the periphery of the settlement system, left behind in older patterns of life abandoned elsewhere on the island and in the channel region generally. Based on survey/auger work conducted in 2012 and excavations from 2013-2015, the occupants of Laguna Canyon navigated those developments in their own ways.

The local environment of Laguna is broadly similar to other south side drainages (Coches Prietos, Willows, and Alamos to the east; Malva Real, Punta Arena, Morse Point, and Posa Creek to the west, see Figure 2a), though unique in terms of immediate access to lithic materials.

From the coast to the ridgeline separating the drainage from the Central Valley, Laguna is 5.4km in length, and approximately 1.2km wide on average for much of its extent. The nearest chert quarries of the contact zone are more than 20km to the northeast as the crow flies. Shawa is 5km west and Liyam slightly more than 8km east, both along the coastline. Laguna encompasses one of the largest exposures of the Sierra Blanca formation on the south side of the island, and its large catchment area means that substantial amounts of workable igneous cobbles erode into the drainage channels. That size, and attendant assumptions about freshwater availability that would result from such a large catchment area, has led some to consider it a highly ranked area for settlement (Winterhalder et al. 2010). Despite the size of the drainage and these abundance of some resources, Laguna was not likely an attractive place for settlement compared to drainages like Coches Prietos, Morse Point, or Posa Creek. The steep beach, which prevents ready access by boat except under favorable conditions, was undoubtedly an important factor in preventing larger occupation in Laguna during prehistory, but it is equally possible that freshwater may not have been as readily available as the catchment area itself might suggest. The canyon was not likely a preferable place for settlement, evident in the lack of a large coastal village during this span. The fact that Laguna is still assigned a high rank relative to other south side drainages (especially Coches Prietos) in some models demonstrates one of the challenges of identifying appropriate variables when dealing directly with environmental considerations (Winterhalder et al. 2010). One potentially critical variable in the continued occupation of Laguna into the Transitional period is its proximity to Sierra Blanca itself (2.8km northwest of the beach at Laguna). Blanca is the highest point on the south side of the island. No clear connections exist to link the occupation of Laguna to sites there, but the possibility must be acknowledged as important but currently unquantifiable.

Following Junak (1995), I recognize coastal-sage scrub, coastal-bluff scrub, coyote-brush scrub, coastal marsh and estuary, riparian herbaceous vegetation, and mule-fat scrub as common communities at various points within the canyon. The vegetation distributions in prehistory likely differed significantly from the pattern observed today, but the abundance of plant resources in the canyon points to the possibility of similar abundance in the past. The impact of depopulation, ranching operations, the introduction of invasive non-native plant species, and the recent extirpation of introduced stock have all shocked the island ecology successively, and the recovery begun in the last years of the 20th century has only started to establish a new regime.

The environment of Laguna Canyon has been profoundly shaped by these forces. The effects of overgrazing especially are still visible. Throughout the canyon, steep cliffs and sparse ground cover at higher elevations are occupied by coastal-bluff scrub, dominated by *Eriogonum arborescens* (Junak 1995). Different communities are present in the flat valley bottom, generally varying with distance from the coast. Within about 250m of the beach itself, these low elevations are dominated by coastal marsh and estuary, coastal-sage scrub, and riparian herbaceous vegetation. A stand of mixed reeds of the genera *Typha* and *Scirpus* are present immediately inland from the beach, intermixed with coastal-sage scrub (characteristically dominated by *Rhus integrifolia* and *Artemisia californica*). From this distance to approximately 1km inland, the vegetation community in those environments is dominated by coastal-sage scrub and mule-fat scrub, typical of areas heavily disturbed by overgrazing (Junak 1995). Some portions of this area of the canyon include riparian herbaceous vegetation. Further than 1km inland, mule-fat scrub tends to be more common, though it is still mixed with coastal-sage scrub and (along the southern ridge of the Central Valley) a small amount of Bishop pine forest. These patterns are typical of disturbed environments across the northern islands.

The recent history of land use on the islands is dominated by the legacy of ranching after the removal of the island's inhabitants in the early 19th century. Laguna Canyon was denuded of vegetation by grazing, along with much of the island, by the 1990s (see Junak 1995, pg. 7 for an overview of the mouth of Laguna taken in the early part of that decade). Laguna also hosted a castration corral during the days of the Caire ranch operation in the late 19th century, portions of which (in the form of fence posts connected with barbed wire) still stand in the marsh near the mouth of the canyon. Historic reports of the canyon are sparse. It is mentioned briefly in Margaret Holden Eaton's *Diary of a Sea Captain's Wife* as an unfavorable harbor, where a man, reported to be a police officer, drowned while swimming (Eaton 1980). D.B. Rogers' *Prehistoric Man of the Santa Barbara Coast* glosses over the canyon nearly entirely, focusing instead on the much larger occupations at Punta Arena to the west (Rogers 1929). Ronald Olson recorded a number of sites in the canyon (discussed below) but did not seem to conduct any significant excavation at any of them. This lack of interest has itself been an important factor in the preservation of sites in the canyon, and recent work focusing on the island interior will benefit from the contribution of data concerning the entirety of Laguna's occupation and its relationship to local resources for this reason.

For those living in Laguna, regional sociopolitical change led to the development of locally contingent labor practices through the Middle, Transitional, and Late Periods that did not result in bead production. The Middle period assemblage from Laguna suggests that people living in the canyon on a sustained basis made choices about how to engage with the new sociopolitical structures developing around them, even though, in the long term, those decisions resulted in the abandonment of a local resource focus and the adoption of the island-wide toolkit. Middle period lithic use in Laguna was generalized and local, except for chert and very minor amounts of imported exotic mainland lithics. The standard island toolkit of the Transitional and Late periods supplanted this emphasis, as participation in the bead industry increased elsewhere (but not, apparently, in Laguna itself). This productive activity was itself a symbol of changing islander identity and labor relationships, reflected in the patterns of daily life.

Overview of Work

Four seasons of fieldwork from 2012 through 2015 comprise this project, with a small follow-up survey in 2017. I discuss methods in detail in Appendix A and each site individually in Appendix B. Here I provide a brief overview of the two sites I emphasize in my analysis to provide context for Ch. 4: SCRI-845 and SCRI-849. Figures 2a/b and 22 show the location of those sites and the total area surveyed in the canyon.

SCRI-845 is a small site located a short distance from the modern beach. It possesses one apparent house depression, which seems to be intact based on the distribution of artifacts resulting from excavations in 2013 and 2014 (see discussion in Appendix B). The generalized Middle period assemblage at this site includes little evidence for specialized production or intensive bead manufacture but does include extensive chert reduction. Both the artifactual assemblage and the radiocarbon dates (see Table 1) suggest an occupational span through much of the late Middle period, ending before the beginning of the Transitional. Most other sites identified in the canyon appear to be contemporary to this occupation based on artifact patterns. Further work is necessary to test that proposition, however, including radiocarbon dating.

SCRI-849 was the focus of occupation after the late Middle period, when settlement in Laguna concentrated on a single site. SCRI-849 has a complicated taphonomic history (see Appendix B). It appears to have originally been a rock shelter or cave, with occupations both

TABLE 2

RADIOCARBON DATA FOR SITES IN THIS STUDY

Lab No. [a]	Site	Unit	Depth (cm)	Material	Uncalibrated Age (1σ) [b]	Calibrated Age [c]
D-AMS 007536	SCRI-845	15E, 27N	030-035	Wood charcoal	1222±22	764 - 884 A.D.
D-AMS 007537	SCRI-845	15E, 27N	030-035	M. californianus	1735±25	829 - 1020 A.D.
D-AMS 003502	SCRI-845	15E, 27N	045-050	Wood charcoal	1356±27	631 - 695 A.D.
D-AMS 003503	SCRI-845	15E, 27N	065-070	M. californianus	2038±22	561 - 689 A.D.
D-AMS 016503	SCRI-849	13E, 20N	045-050	Wood charcoal	90±19	Modern[d]
D-AMS 016502	SCRI-849	13E, 20N	080-085	Wood charcoal	804±26	1187 - 1272 A.D.

[a] All samples submitted to DirectAMS in Bothell, WA
[b] Uncorrected "radiocarbon date" in years BP
[c] Conversions based on OxCal v4.3.2 (Bronk Ramsey 2017); IntCal13/Marine13 (Reimer et al. 2013); Delta-R from Jazwa et al. (2013)
[d] Date taken from disturbed site component (see Figure 12), with 26.2% probability of the true age falling between 1693-1728 AD and a 73.8% of the age falling between 1812-1919 AD.

Two radiocarbon samples are unreported in the above table: D-AMS 016504 and D-AMS 016505. Due to measurement incompatibilities at the lab during processing, fractionation values could not be obtained and were set to -25‰. Calibration results in dates significantly younger than all other lines of evidence (other 14C dates, deposits, stratigraphy, and artifactual contents) would suggest. Lab-reported uncalibrated ages were 1220±19 for sample D-AMS 016504 and 1301±18 for sample D-AMS 016505. Calibrated ages resulting from these values were 1330-1447 AD and 1289-1404 AD, respectively. D-AMS 016504 came from SCRI-849, 13E, 20N at 115-120cm. D-AMS 016505 came from SCRI-849, 13E, 20N at 155-160cm.

inside the cave and on top of the slab forming the cave roof. The slab collapsed at some point during prehistory, capping the deposit and preserving the lower component (after the beginning of the Late period). This material picks up where material from SCRI-845 left off, suggesting a late Middle and Transitional period occupation. The disturbed upper component of the site contains significantly younger material as well, spanning through to the Historic period. Those living at SCRI-849 adopted the Transitional and Late period lithic toolkit (formal chert microdrills), though in the earliest phase of occupation at the site they were still producing local igneous drills.

The primary analytical challenge of this project lies in evaluating the archaeological patterns of use (and re-use) resulting from multiple overlapping production events and establishing the types of production that occurred on-site. This is especially crucial in the exploitation of low-quality materials that did not circulate widely yet occupied the middle ground between culturally-mediated production of formal tools for specific tasks and the relative lack of abundant high-quality materials on the islands (see also Perry and Delaney-Rivera 2011; Perry and Glassow 2015; Perry and Jazwa 2010). The analysis of the Laguna assemblage presented below addresses the nature of chert use in the later Middle period and its relationship to later specialized microdrill production occurring elsewhere on SCRI, with implications for the use of that material over multiple millennia in the region. Another component of this analysis lies in assessing the generalized late Middle period patterns of Laguna in the context of the eventual adoption of the Late period toolkit. Those living in Laguna abandoned late Middle period labor organization by importing formal drills, providing a window into the cultural landscape of the period. In evolutionary terms, the misses and hits are equally important. The misses may in fact be more important, because as selection drives change through time, many more of the misses must have initially existed than hits. Identifying the long-term trajectory of strategies that were unsuccessful, alongside those that were, helps develop a picture of the shape of past adaptive cultural landscapes.

CHAPTER 4 – ANALYSES

ASSEMBLAGE

The occupation of Laguna is typical of the late Middle period (see Appendix A for specific site descriptions). *Mytilus californianus* dominates the shellfish assemblage, with a small but significant presence of *Haliotis cracherodii*. Vertebrate fish are primarily taken from nearshore habitats in the rocky subtidal. The artifactual assemblage is dominated by thick leaf-shaped points, bone barbs, local toolstone, and late Middle period bead types (see the assemblage patterns discussed in both Kennett 2005 and Perry and Glassow 2015). Cherts of all types compose only ~1/3 of the material, whereas the rest is igneous. This pattern is critical for understanding the nature of occupation in the canyon, and potentially much of the occupation of the Santa Barbara Channel region. Kennett (2005) catalogues the distribution on the landscape and the patterns of diagnostic artifacts present at sites dating to the late Middle and Transitional/Late periods on the islands, in his Tables 15, 16, and 17 (Kennett 2005: 161-168, 170-180). The diagnostic artifacts referenced in those tables are summarized in Table 35.

TABLE 3

TYPICAL PATTERNS OF DIAGNOSTIC MIDDLE AND LATE PERIOD ARTIFACTS AT ISLAND SITES

Period	Age	Description
late Middle	1300-650BP	Leaf-shaped points, Olivella wall and barrel beads, J-shaped fishhooks, trapezoidal microblades/microdrills
Late	650-200BP	Leaf-shaped and concave-base points, triangular (dorsal retouch) drills, C-shaped fishhooks, Olivella callus beads

At the landscape level, Laguna's occupation also followed the pattern typical of SCRI in this period from a relatively dispersed settlement pattern throughout the canyon, between approximately 600 and 900 A.D., to a condensed pattern centered on SCRI-849 by the end of the Middle period (after ca. 1000 A.D.) and beyond, based on the analysis of assemblages from each site. Radiocarbon dating further supports this interpretation at the two largest and best-preserved surviving sites in the canyon. Below, I evaluate the classes of artifacts composing the Laguna assemblage.

WORKED SHELL

Beads from sites throughout the canyon (except at SCRI-849, discussed in detail in Appendix A) date to the late Middle period. Islanders living in Laguna were clearly bead-makers, to a certain degree, though the presence of small amounts of beads and production detritus does not mean that Laguna was an important locus of bead production. Compared with major bead-making locales like Posa Creek (SCRI-474/475) and Christy Beach (SCRI-191), it is unlikely that people living in Laguna made significant quantities of beads of any kind in the canyon (Arnold 2001). All totals for beads, BIPs, blanks, and manufacturing detritus from all shell materials recovered during this project are shown in Tables 2-9 below. Photographs of representative artifacts are included in Figure 17.

A scattering of *Olivella biplicata* spire-ground, spire-lopped, mini-barrel, and barrel beads are present throughout the canyon. Most of the identified beads, however, are thin-lipped (E1a1) and saucer (G2[a&b]) wall beads (Bennyhoff and Hughes 1987). A small number of callus beads and a single needle-drilled bead are present in the Laguna assemblage, mainly in the upper (disturbed) portions of SCRI-849 in association with other Late and Historic period artifacts (e.g., TDR drills, ovicaprid elements [see Appendix A]). The exception, one callus bead recovered at 085-093cm depth in unit 13E, 20N, suggests a small amount of mixing associated with a collapse event at that site. Below that point, however, no post-Middle period beads were recovered, nor were any identified from excavations at SCRI-845 and augers at any other sites in the canyon. This supports the argument that the occupation of Laguna largely ended by the late

TABLE 4

OLIVELLA DETRITUS FROM AUGERS

Site	Unit	Depth (cm)	Assemblage[a]	Count	Weight (g)
SCRI-843	2S	020-050	M	6	0.85
SCRI-843	3S	020-030	M	1	0.15
SCRI-845	1S	000-020	M	3	0.44
SCRI-845	2S	000-020	M	28	3.89
SCRI-845	3S	000-050	M	20	4.28
SCRI-845	4S	000-100	M	9	0.87
SCRI-845	1E	000-020	M	6	0.56
SCRI-845	2E	000-040	M	23	2.84
SCRI-848	2E	010-020	M	4	0.33
SCRI-849	1E	000-010	M/T[b]	1	0.21
SCRI-849	2E	000-040	M/T[b]	2	0.44
SCRI-849	3E	000-090	T	14	2.42
SCRI-849	3E	080-090	M	5	1.09
SCRI-851	2	000-020	M	2	0.30

.[a] M = Middle, T = Transitional

b Augers 1E/2E were located in eroded deposits of indeterminate assemblage composition, likely representing much of the occupational span of the site and not any single period (including Late/Historic period materials).

TABLE 5

OLIVELLA WALL[a] BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM AUGERS

Site	Unit	Depth (cm)	Blank	BIP	Bead	Total
SCRI-843	2S	030-040	-	-	1	1
SCRI-845	3S	000-020	4	-	-	4
SCRI-845	4S	050-110	4	2	-	6
SCRI-845	1E	000-010	-	1	-	1
SCRI-849	2E	030-040	-	1	-	1
SCRI-849	3E	080-090	-	1	-	1
SCRI-851	2	030-040	-	-	1	1

[a] No Callus bead production material was recovered during augering

TABLE 6

OLIVELLA DETRITUS FROM EXCAVATIONS[a]

Site	Unit	Depth (cm)	Count	Weight (g)
SCRI-845	15E, 27N	010-015	23	5.61
SCRI-845	15E, 27N	030-035	46	13.30
SCRI-845	15E, 27N	035-040	53	12.11
SCRI-845	15E, 27N	040-045	23	5.49
SCRI-845	15E, 27N	045-050	71	7.19
SCRI-845	15E, 27N	050-055	42	8.26
SCRI-845	15E, 27N	055-060	24	4.75
SCRI-845	15E, 27N	060-065	20	3.32
SCRI-845	18E, 18N	005-010	149	21.34
SCRI-845	18E, 18N	020-025	60	14.85
SCRI-845	18E, 18N	025-030	67	10.92
SCRI-845	18E, 19N	015-020	116	19.17
SCRI-849	13E, 20N	075-080	105	10.65
SCRI-849	13E, 20N	085-093	180	24.19
SCRI-849	13E, 20N	105-110	97	9.52
SCRI-849	13E, 20N	115-120	68	9.88

.[a] Totals in this table are drawn from fully sorted and analyzed levels

TABLE 7

OLIVELLA BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM SCRI-845, 15E, 27N

	WALL				CALLUS			
Depth (cm)	Blank	BIP	Bead	Total	Blank	BIP	Bead	Total
010-015	-	1	-	1	-	-	-	-
030-035	-	1	-	1	-	-	-	-
035-040	-	2	2	4	-	-	-	-
040-045	-	1	2	3	-	-	-	-
045-050	1	1	1	3	-	-	-	-
050-055	-	-	1	1	-	-	-	-
055-060	-	1	-	1	-	-	-	-
060-065	-	1	-	1	-	-	-	-

TABLE 8

OLIVELLA BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM SCRI-845, 18E, 18/19N

	WALL				CALLUS			
Depth (cm)	Blank	BIP	Bead	Total	Blank	BIP	Bead	Total
005-010[a]	-	8	1	9	-	-	-	-
015-020[b]	1	4	1	6	-	-	-	-
020-025[a]	2	-	1	3	-	-	-	-
025-030[a]	-	6	-	6	-	-	-	-

[a] 18E, 18N
[b] 18E, 19N

TABLE 9

OLIVELLA BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM SCRI-849, 13E, 20N

	Wall				Callus			
Depth (cm)	Blank	BIP	Bead	Total	Blank	BIP	Bead	Total
035-040	-	-	-	-	-	-	1	1
040-045	-	-	-	-	-	-	1	1
050-055	-	-	1	1	-	-	4	4
055-060	-	1	-	1	-	-	-	-
070-075	1	-	-	1	-	1	-	1
075-080	3	4	-	7	-	-	2	2
080-085	-	1	-	1	-	-	-	-
085-093	-	8	2	10	7	-	1	1
093-095	-	-	1	1	-	-	-	-
095-100	-	2	4	6	-	-	-	-
100-105	-	1	-	1	-	-	-	-
105-110	-	6	-	6	-	-	-	-
115-120	5	8	6	19	-	-	-	-
120-125	-	2	2	4	-	-	-	-
155-165	-	-	1	1	-	-	-	-

TABLE 10

Other types of Olivella Beads					
Site	Unit	Depth	Type	Count	Weight
SCRI-845	15E, 27N	040-045	Spire-ground	1	1.51
SCRI-845	15E, 27N	055-060	Barrel	1	0.21
SCRI-845	15E, 27N	055-060	Spire-ground	1	0.18
SCRI-845	18E, 18N	025-030	Spire-ground	1	1.10
SCRI-849	13E, 20N	085-093	Barrel	1	0.24
SCRI-849	13E, 20N	085-093	Mini-barrel	2	0.05

.

TABLE 11

Other Worked Shell						
Site	Unit	Depth	Material	Type	Count	Weight (g)
SCRI-845	15E, 27N	035-040	*H. rufescens*	Detritus	3	3.00
SCRI-845	15E, 27N	045-050	*Trivia sp.*	Bead	1	0.15
SCRI-845	15E, 27N	045-050	*H. rufescens*	Bead blank	1	0.77
SCRI-845	15E, 27N	055-060	*Trivia sp.*	Bead	1	0.40
SCRI-845	18E, 18N	020-025	*Trivia sp.*	Bead	1	0.18
SCRI-845	18E, 18N	020-025	*H. rufescens*	Detritus	1	0.92
SCRI-845	18E, 18N	025-030	*H. rufescens*	Detritus	1	0.24
SCRI-849	13E, 20N	075-080	*M. californianus*	Bead	1	0.01
SCRI-849	13E, 20N	085-093	*M. californianus*	BIP	1	0.05
SCRI-849	13E, 20N	085-093	*H. cracherodii*	Chipped/Modified	1	4.58
SCRI-849	13E, 20N	085-093	*Ostrea sp.*	Chipped/Modified	1	12.11
SCRI-849	13E, 20N	105-110	*Haliotis sp.*	Ornament-in-production[b]	2	0.49
SCRI-849	13E, 20N	105-110	*H. rufescens*	Chipped/Modified	1	0.69

[a] Rectangular *Haliotis* pendants lacking epidermis, of the types King assigns to periods M5a and M5b, 900-1050 A.D. (King 1990:252)

Middle or early Transitional period except at SCRI-849, which persisted at the very least into the Late period and likely the Historic as well (on the basis of a single needle-drilled disk bead from the 050-055cm level in unit 13E, 20N).

Production detritus associated with bead manufacture occurs only in low frequencies throughout Laguna. The highest densities are associated with two units: 18E, 18N at SCRI-845; and 13E, 20N at SCRI-849. In the 18E, 18N unit, the heaviest concentrations of Olivella detritus are present at the very top of the deposit (see Table 6). I interpret the presence of production detritus in this unit, but not in 15E, 27N, to reflect activity areas at the site during its occupation (see also discussion of lithics at SCRI-845, below, and in Appendix A). Furthermore, the levels at the top of this unit coincide with the occupational shift to SCRI-849 (and the types of continuing production at that site), as well as with increasing bead production intensity elsewhere on the southwest portion of SCRI.

Along with detritus, BIPs are an important indicator of bead manufacture. At major bead-making sites elsewhere, counts per 5cm level top more than one hundred BIPs (Arnold 2001). By contemporary standards on SCRI, few BIPs were recovered during this project. Of the wall BIPs, 19 come from SCRI-849 and the rest from all other sites in this study (see Tables 6-8). Number of BIPs in a given level is positively correlated with high detritus counts ($r = 0.77$), as expected. The totals involved are very low, however, but I suggest that this correlation is the result of in situ production rather than simply overall density of deposits in those contexts.

The occupants of Laguna are best understood as small-scale producers who continued to make beads for personal or local consumption during the late Middle period. The massive increases in production detritus seen elsewhere on SCRI are simply not present in this sample.

The material correlates for significant, sustained bead production are well established, and the Laguna assemblage demonstrates that such production did not develop there. While producers specialized elsewhere nearby, bead-making remained at most a limited pursuit in Laguna.

Lithics

The Laguna lithic assemblage is dominated by locally available igneous materials, of variable quality, rounded out by cherts primarily derived from sources on SCRI. I did not identify any large outcrops of igneous toolstone during a follow-up survey on Sierra Blanca in 2017, suggesting that cobbles were collected opportunistically and that any locations of dense tool stone concentrations were the result of erosional patterns. In my analysis I document a shift from local production centered on the use of these igneous cobbles to the adoption of the island-wide toolkit typical of the Transitional period and beyond. The unique record of the canyon, evident in the production of igneous microblades in the late Middle period, points to a previously unreported history of such manufacture, with important implications for our understanding of the development of the bead industry on SCRI. Images of selected lithics from this assemblage are provided in Figures 18A – 18C.

Cores

I first divided cores in this assemblage by material type, between Laguna igneous (*n*=52) and chert (*n*=41) material types. The chert core assemblage is further divided between significantly heat-altered cores (*n*=18) and non-altered cores (*n*=23). For details on these artifacts, see Tables 12 through 14. These categories are based primarily on tests of color, consistency, and the identification of heat-treatment features (Domanski and Webb 1992). These features have been suggested to be potentially unreliable, however, and I strongly believe that

TABLE 12

CORES FROM EXCAVATIONS AT SCRI-845, UNIT 15E, 27N

	Chert			Igneous		
Depth	Core	Microblade Core	Total	Core	Microblade Core	Total
010-015	1[b]	-	1	1	3	4
015-020	-	-	-	1	1	2
020-025	-	1[a]	1	1	1	2
025-030	3[e] (1[a],2[b])	-	3	1	8	9
030-035	1[b, e]	-	1	1	4	5
035-040	6[a] (3[e])	4 (3[a],1[d])	10	3	8	11
040-045	1[a]	1[a]	2	-	-	-
045-050[f]	1[a]	2[a]	3	1	5	6
050-055	6[a] (5[e])	2[a]	8	-	6	6
055-060[f]	-	5 (1[a], 4[c])	5	-	4	4
060-065	2 (1[a, e], 1[c])	2[a]	4	2	5	7
065-070	1[b]	-	1	1	-	1
070-075	1[b, e]	-	1	1	-	1

[a] SCRI
[b] Monterey
[c] Other (exotic)
[d] Fused shale
[e] Heat treated
[f] Quartzite cores not included in totals, 1 in each level

TABLE 13

CORES FROM EXCAVATIONS AT SCRI-845, UNITS 18E, 18/19N

Unit	Depth	Chert			Igneous		
		Core	Microblade Core	Total	Core	Microblade Core	Total
18E, 18N	000-005	-	-	-	1	-	1
18E, 18N	005-010	1[a]	-	1	1	2	3
18E, 19N	010-015	-	-	-	3	4	7
18E, 19N	015-020	2 (1[a], 1[b])	-	2	1	1	2
18E, 18N	015-020[f]	1[a, e]	-	1	-	2	2
18E, 18N	020-025	5[a] (2[e])	1[a]	6	1	7	8
18E, 18N	025-030[g]	10[a]	-	10	2	-	2
18E, 18N	030-035	2[a, e]	-	2	-	1	1

[a] SCRI
[b] Monterey
[c] Other (exotic)
[d] Fused shale
[e] Heat treated
[f] 1 crystalline core not included in totals
[g] This unit/level dealt with in greater detail in Table 15 (see Appendix B)

TABLE 14

CORES FROM EXCAVATIONS AT SCRI-849, UNITS 13/14E, 20N

Unit	Depth	Chert			Igneous		
		Core	Microblade Core	Total	Core	Microblade Core	Total
14E, 20N	040-045*	-	1[a]	1	1	-	1
13E, 20N	040-045*	-	-	-	1	-	1
14E, 20N	045-050*	-	-	-	1	1	2
14E, 20N	050-055*	-	-	-	2	-	2
14E, 20N	055-060*	-	-	-	2	-	2
14E, 20N	060-065*	-	-	-	3	-	3
13E, 20N	065-070*	-	-	-	1	-	1
13E, 20N	070-075*	-	-	-	3	-	3
13E, 20N	080-085	-	-	-	1	1	2
13E, 20N	085-093	-	-	-	6	7	13
13E, 20N	093-095	-	-	-	1	-	1
13E, 20N	095-100	-	-	-	2	-	2
13E, 20N	100-105	-	-	-	2	6	8
13E, 20N	105-110	-	-	-	1	6	7
13E, 20N	115-120	-	1[a]	1	-	4	4
13E, 20N	125-130	-	-	-	1	-	1
13E, 20N	150-155	-	-	-	-	2	2

* Above collapse level, out of context (see site description in Appendix B)
[a] SCRI

further analysis is necessary to more fully evaluate heat-treatment techniques in the region (Andrefsky 1994b; Jew and Erlandson 2013). Consistent with known Middle period production patterns, however, there is little evidence for significant core preparation beyond the preliminary evidence for heat treatment in the Laguna assemblage. Cortex present on some of the igneous cores (see Figures 18A) demonstrates that they were ultimately derived from cobble sources, evident in the polished, rounded cortex. Chert cores tend to have large amounts of inclusions, with some possessing significant cortex.

Even though cores of both types are similar in morphology, they are not evenly distributed at sites in Laguna Canyon. I note here that augers did not yield cores at SCRI-845 and SCRI-849, where excavation later would, and that the strong possibility exists that cores are widely distributed at sites in Laguna but were not recovered due to sampling strategy. As a result, I discuss the distribution of cores at the two sites where I conducted excavation, treating them preliminarily as a proxy for the larger assemblage pattern. Future work would be necessary to test this assumption. Regardless of sampling, the overall assemblage patterns shared between SCRI-845 and other late Middle period sites in the canyon (evident in the auger samples) make SCRI-845 a good case study to understand production patterns at sites throughout the canyon.

With that caveat, the most striking pattern of core distribution is the complete lack of chert cores from excavated units at SCRI-849. The complete absence is unexpected in Middle period deposits and may partially be the result of the ongoing analysis of Middle period material at that site. I have sorted Transitional period material, which does not contain cores. This distribution is consistent, however, with the island-wide pattern of chert access during the late Middle and Transitional periods. Based on observations at SCRI-191, SCRI-474, SCRI-192, and elsewhere, Arnold suggests that control of the east end chert quarries was restricted to those living nearby during this period (Arnold 2001). The Laguna assemblage strongly supports this interpretation of material availability during this timeframe.

The assemblage from units 18E, 18N and 18E, 19N at SCRI-845 is not only richer in material terms but also larger than that of SCRI-849, despite the shallower and less dense deposits at the former site (see Tables 12 & 13). Those units, at only 40cm maximum depth (20cm in the stepped 18E, 19N unit), yielded a high density of (primarily exhausted) cores and associated debitage. The 25-30cm depth in 18E, 18N yielded the best-preserved association of cores in the entire assemblage (see Table 15, located in the table list at the end of this document due to length, for metrics of these artifacts separate from the larger assemblage). Chert cores in this context were intensively heat treated. A lack of charcoal in situ with these finds suggests heat treatment was not a part of the reduction sequence in this specific instance, and that cores were pre-treated either before arriving at the site or before this final production episode. Furthermore, subject to the considerations discussed above, heat-treatment of chert artifacts appears to be pervasive in Laguna, and evidence of the technique is not restricted to a few cores at SCRI-845 (see Tables 12 & 13). This suggests that the 25-30cm level in unit 18E, 18N at SCRI-845 represents a common reduction process and that chert may have largely been heat-treated before it arrived in Laguna, especially in core form.

One consideration in the use of heat treatment may have been the simultaneous rarity and poor quality of available chert during the late Middle period in Laguna. Chert cores present at SCRI-845 are generally of low quality. Every fragment of the usable material has been worked out, leaving only the least desirable material behind (see Figure 18B). Heat treatment was undoubtedly a necessary phase in the use-life of these small and low-quality cores (see Table 16 in Appendix B for a list of all artifacts with evidence of heat treatment). The intensive use of all chert in Laguna, especially later in the Middle period, suggests that that material was precious. In functional terms, much of the chert in this assemblage is of lower quality than the fine-grained igneous material locally available. This pattern strongly suggests that non-functional considerations primarily conditioned the distribution of chert. This suggests a cultural preference for chert that existed long before the late Middle period (see Ch. 5).

MICROBLADE CORES

A subset of the cores from SCRI-845 and SCRI-849, microblade cores are characterized by the presence of one or more clear microblade flake scars (see Figures 18A and 18C). The patterning and appearance of these scars varies somewhat, especially within the igneous microblade core assemblage, but generally conforms to the definitions of Middle period microblade cores described by Arnold et al. (2001) and by Kennett (2005). In evaluating this sub-assemblage, similarities between exhausted chert and igneous microblade cores suggest that these cores were the result of a single reduction sequence, with minor variations attributable to material differences. Regardless of these variations, the final products (i.e. exhausted microblade cores) are statistically drawn from the same population. I compared the populations of chert and igneous cores via the Mann-Whitney U test, illustrating the likelihood that their similarities in weight and volume are the result of a single approach to reduction shared between the two materials. I took the null hypothesis in this case to be that different materials would be reduced differently, or that igneous cores might be rejected earlier in the reduction sequence (and therefore as a population have statistically different mass values than chert cores), and that microblade cores would therefore reflect these differences. Tests of both weight (W = 920.5, p-value = 0.2205) and volume (W = 917.5, p-value = 0.2304) suggest that these cores are members of the same population of artifacts. I therefore reject the null hypothesis. The same microblade production process was applied to both materials. This may be the result of the very low quality of the chert cores in question, which have numerous inclusions, compared to the relatively high-grade igneous material used for microblade cores. A clear pattern of material choice emerges from these artifacts: low-quality cherts, heavily heat-treated to make them suitable for delicate work, and relatively high-quality igneous materials utilized in a similar manner (minus heat-treatment).

The occupants of Laguna engaged in significant amounts of production on site utilizing fine-grained igneous materials, likely because of their workability, their accessibility, or some combination of both. The surprising delicacy of the igneous assemblage presents an important new source of data on local production, only infrequently addressed in the literature previously despite the ubiquity of non-chert tools (for example, in Cassidy et al. 2004). My analysis of microliths and core/flake tools (below) further demonstrates the links between chert and local toolstone use.

Core and Flake Tools

Much of this assemblage is dominated by non-diagnostic flakes, relatively large core and flake tools, Middle period bifaces, and a scattering of macrodrills. The tool typology suggested in Sunell (2013) was a first-pass approach to the problem of addressing the previously unrecognized igneous materials present in Laguna, but I utilize it below because it describes the general morphology of tools present in this assemblage more effectively than other typologies.

Other researchers have also attempted to address the interpretive problems presented by cobble cores with classificatory systems, but this approach fails to address the underlying problem because these systems generally attempt to describe cobble form rather than reduction sequence or tool type (see Des Lauriers 2010 for a discussion of this issue on a similar assemblage from Baja California). Expedient tool production utilizing cobble cores, especially of low quality materials like those found in Laguna, makes typologies focused on core morphology unwieldy. This approach also unnecessarily divorces material from reduction processes. When attempting to understand how and why knappers chose individual cobbles for individual production episodes, it is more important to understand the material type and the reduction sequence, rather than core form specifically. Furthermore, the evidence from Laguna suggests that core reduction was not the primary on-site activity (therefore making cobble form identification practically impossible). Instead of categorizing these activities, then, I evaluate this assemblage through the lens of reduction sequences and tool morphology. Table 17 summarizes data relating to core tools recovered during excavations at SCRI-845 and SCRI-849. No tools of these types were recovered during augering or surface survey at other sites in Laguna, which I interpret to be the result of sampling strategy rather than absence of such tools at other sites.

The cobble tools (CECT/SECT) and flake tools (CET/SET) represent utilized components of a reduction sequence that likely began with water-worn clasts eroding from the conglomerate bedrock of the canyon (for definitions, see Sunell 2013). This pattern holds true for the Laguna assemblage broadly, suggesting that most cobble testing took place at the point of collection and that the igneous assemblage present at the sites in this study represents intentional selection of the highest-quality materials. The characteristic convex edges of CECT/CETs are the result of working rounded cobbles, while SECT/SETs derive instead from already-reduced

TABLE 17

CORE TOOLS

Site	Unit	Depth (cm)	Item[a]	L (mm)	W (mm)	T (mm)	Weight (g)
SCRI-845	15E, 27N	015-020	SECT	78.48	54.93	20.00	88.96
SCRI-845	15E, 27N	025-030	CECT	52.25	41.92	12.28	25.34
SCRI-845	15E, 27N	025-030	SECT	77.84	67.03	7.89	53.36
SCRI-845	15E, 27N	035-040	CECT	50.18	48.21	13.29	27.96
SCRI-845	15E, 27N	035-040	SECT	39.49	46.90	7.12	24.51
SCRI-845	15E, 27N	035-040	SECT	68.52	43.41	19.62	68.88
SCRI-845	15E, 27N	035-040	SET	58.61	41.07	5.90	25.76
SCRI-845	15E, 27N	040-045	CET	46.98	41.79	8.29	17.32
SCRI-845	15E, 27N	045-050	CECT	36.18	33.09	9.47	9.76
SCRI-845	15E, 27N	045-050	CECT	36.58	53.40	9.29	19.24
SCRI-845	15E, 27N	045-050	CECT	38.72	39.66	9.21	18.47
SCRI-845	15E, 27N	045-050	CECT	42.09	30.98	7.39	12.00
SCRI-845	15E, 27N	045-050	SECT	47.18	51.20	16.71	49.16
SCRI-845	15E, 27N	055-060	CECT	36.28	47.69	7.84	12.69
SCRI-845	15E, 27N	055-060	CECT	56.89	35.72	11.59	28.86
SCRI-845	15E, 27N	070-075	CECT	48.19	39.39	15.70	34.06
SCRI-845	15E, 27N	070-075	CECT	74.77	54.62	31.35	157.01
SCRI-845	15E, 27N	070-075	CET	52.58	26.94	18.92	31.54
SCRI-845	18E, 18N	005-010	CECT	39.09	30.71	13.69	13.13
SCRI-845	18E, 18N	010-015	CECT	59.47	25.80	11.77	19.17
SCRI-845	18E, 18N	010-015	CECT	82.01	65.41	41.78	255.27
SCRI-845	18E, 18N	010-015	SECT	57.48	41.42	21.86	38.42
SCRI-845	18E, 18N	010-015	SET	64.43	44.81	32.49	88.29
SCRI-845	18E, 18N	020-025	CET	39.50	31.01	10.79	14.22
SCRI-845	18E, 18N	020-025	SET	66.49	25.71	11.30	17.61
SCRI-845	18E, 18N	035-040	CECT	132.09	94.48	51.30	930.90
SCRI-845	18E, 19N	010-015	CECT	75.46	60.39	28.42	100.12
SCRI-845	18E, 19N	015-020	CECT	57.30	39.09	13.50	32.61
SCRI-845	18E, 19N	015-020	SECT	78.09	57.02	35.91	93.03
SCRI-849	13E, 20N	045-050	SET	63.51	33.49	16.88	31.64
SCRI-849	13E, 20N	080-085	CET	69.68	38.84	13.49	31.80
SCRI-849	13E, 20N	095-100	SET	73.18	64.80	21.68	111.68
SCRI-849	13E, 20N	115-120	SECT	67.19	54.98	30.29	100.29
SCRI-849	14E, 20N	015-020	SECT	74.32	49.50	17.23	49.49
SCRI-849	14E, 20N	075-080	SECT	91.62	61.58	40.11	271.00

. [a] Item descriptions provided in Ch. 3, drawn from Sunell 2013 cobbles or from large fragments of debitage produced during core reduction. This may partially explain why convex edge tools are more common (*n*=19) than straight edge tools (*n*=16), though the extremely small sample size makes any determination based on this assemblage alone impossible without further work. The balance of cobble tools (CECT/SECTs; *n*=26) to flake tools (CET/SET; *n*=10) supports this hypothesis more strongly. Some of the CETs described in Sunell (2013), for example, are exhausted cores and/or core rejuvenation flakes created by splitting exhausted amorphous cores in half to produce new platforms on the interior surface (Sunell 2013 [see also Figures 18A and Table 17]). This reduction sequence shares many similarities to that described for Isla Cedros in Baja California (Des Lauriers 2010). Stream-worn cobbles were selected based on material uniformity and reduced centripetally to yield a wide range of functional, but informal, tools (Des Lauriers 2010:106-108).

I did not identify any significant use-wear during preliminary analysis of these tools. I believe that this is the result of some combination of two factors: these tools were not utilized heavily or repeatedly and thus lack use-wear traces because of the toughness of the material; or the cobble tools recovered during excavation were brought to residential sites to serve primarily as cores rather than as tools. On the basis of the assemblage, it is impossible to distinguish between discrete patterns in the utilization of these artifacts. A random sample of materials collected at drainage channels in Laguna during survey in 2017 suggests that core tools discarded at residential bases like SCRI-845 and SCRI-849 were more likely to be composed of high-quality toolstone relative to the total population of available cobbles (i.e. these tools exhibit aphanitic textures and few inclusions compared to much of the available material in the Blanca formation). These artifacts were therefore more likely to have been selected as cores specifically, rather than as tools. A larger sample (both in terms of total number of artifacts and in terms of

TABLE 18

BIFACES [a]

Site	Unit	Depth (cm)	Material	Item	Count	Weight (g)
SCRI-851	1 (Auger)	000-025	SCRI Chert	Leaf-shaped point	1	0.43
SCRI-845	15E, 27N	035-040	SCRI Chert	Leaf-shaped point	1	1.39
SCRI-845	15E, 27N	050-055	Igneous	Biface (preform)	1	5.09
SCRI-845	15E, 27N	055-060	SCRI Chert	Leaf-shaped point	1	2.86
SCRI-845	15E, 27N	060-065	SCRI Chert	Biface (frag.)	2	0.89
SCRI-845	18E, 18N	005-010	SCRI Chert	Biface (frag.)	1	0.41
SCRI-845	18E, 18N	025-030	Fused Shale	Leaf-shaped point	1	0.19
SCRI-845	18E, 19N	010-015	SCRI Chert	Contracting stem point	1	6.65
SCRI-845	18E, 19N	015-020	SCRI Chert	Biface (frag)	1	0.51
SCRI-845	18E, 19N	015-020	SCRI Chert	Biface (preform)	1	0.30
SCRI-845	18E, 19N	015-020	SCRI Chert	Leaf-shaped point	1	0.71
SCRI-849	13E, 20N	040-045	Quartzite	Biface (frag.)	1	23.87[b]
SCRI-849	13E, 20N	075-080	Igneous	Leaf-shaped point	1	1.84
SCRI-849	13E, 20N	095-100	SCRI Chert	Leaf-shaped point (frag.)	1	0.04
SCRI-849	13E, 20N	125-130	SCRI Chert	Leaf-shaped point (frag.)	1	1.46
SCRI-849	14E, 20N	095-100	Igneous	Biface	1	174.95[c]
SCRI-849	Slope[d]	Surface	Igneous	Biface	1	11.41

[a] All bifaces recorded in this table (except as noted below) are indeterminate except where noted or described.
[b] This large, bifacially worked flake fragment does not appear to have been a fragment of a formal tool and was apparently expediently retouched for use rather than formed specifically with the intent of producing a biface.
[c] This very large, early-stage biface is unique in the assemblage, both in size and form.
[d] See description of SCRI-849 in Appendix B for a detailed explanation of this context.

geographic distribution) of low-quality materials is necessary to begin to understand patterns of use and discard more broadly, and to better understand differences between the use of igneous materials for core tools vs. other types of tools (discussed below).

BIFACES

Bifaces in Laguna are generally made from SCRI chert, though at least a handful of bifaces are made from local igneous material (see Figures 18A and 18C and Table 18). The total number of recovered bifaces is extremely low (finished bifaces, biface fragments, and preforms included; *n*=17 [see Table 18]). I identify both finished bifaces and fragments/preforms in multiple materials: chert (*n*=11), igneous (*n*=4), fused shale (*n*=1), and quartzite (*n*=1). The small projectile points in this assemblage are typical of the Middle period, relatively thick in cross-section and possessing convex or stemmed bases (Kennett 2005; Pletka 2001a). Despite their low frequency, the appearance of these bifaces in the Laguna assemblage is critical to understanding chert use in the Middle period. Pletka suggests that the institutionalization of trade in the Transitional and Late periods led to changes in the distribution and valuation of bifaces (Pletka 2001a). The trade in bifaces was not exclusively between islands and mainland, however. Intensive production focused on biface production is also evident at SCRI-724 (Perry and Jazwa 2010). The transportation of these bifaces to the western portion of SCRI (e.g. Punta Arena [Glassow et al. 2008]) indicates the importance of intra-island distributions alongside cross-channel ones. Whatever their origins, it was the value of bifaces as symbolic as well as functional artifacts that determined their place in the trade network. This argument is supported by the evidence from Laguna.

The appearance of more chert bifaces and their presence at sites throughout the region generally is partially the result of researcher bias and partially the result of the likely use-lives of these classes of tools. I suggest that one possible explanation for this pattern in Laguna (following both Pletka and Perry & Delaney-Rivera) results from the treatment of low-value igneous bifaces as opposed to chert bifaces of greater value that may have been re-sharpened and re-used more frequently (Perry and Delaney-Rivera 2011; Pletka 2001a). This is supported by the differences in biface-thinning flake frequencies as well as the relative appearance rates of bifaces themselves (see discussion of flakes below, as well as the summary of biface-thinning flakes presented Table 19).

SCRI chert bifaces appear in the Middle period component of the assemblage (dominantly at SCRI-845) but disappear, along with chert cores, by the Transitional period. Though rare, I would expect to recover between two and four bifaces in some combination of materials from the sorted Transitional period (and later) deposits if their frequency remained unchanged after the Middle period. I base this estimate on the ratio of 1 biface per 25kg of midden that holds true for Middle period material at SCRI-845 and SCRI-849 alike. I report two bifaces from those contexts, one an igneous leaf-shaped point clearly made using the same techniques as equivalent chert bifaces (see bifaces pictured in Figures 18A and 18C). Whatever tasks they may have served in the Middle period certainly did not cease to be necessary in the Transitional period. The presence of the lone igneous projectile point in this assemblage suggests that, even as the overall assemblage shifts toward the Late period pattern relative to the preceding material, islanders replaced some classes of chert artifacts with those made of local materials because of the restriction of chert in the Transitional period. It is impossible to generalize based on this object alone, but debitage analysis adds another dimension to this picture by providing indirect evidence for the trajectory through time of small tool production in both materials.

DEBITAGE AND FLAKES

The Laguna assemblage is characterized by large amounts of debitage and broken flakes, with relatively few complete flakes. This is partially due to the coarse nature of local igneous materials, which present an interpretive challenge to the identification of flake features. I rejected many likely flakes due to this type of ambiguity. I believe that this resulted in the identification of fewer igneous flakes than chert flakes in this assemblage, even if the overall patterns of production are not dissimilar. Measurements for every piece of debitage and every flake in the Laguna assemblage are provided in tables 18 and 19, omitted here but included in the list of tables below due to length.

I encountered two primary challenges in analyzing this assemblage and adopted specific strategies (discussed below) as a result. One issue is the unconstrained variability of initial core form. Because the population of cores is unknown, I elected to avoid analyses that rely on assumptions about their sizes or features. I rejected primary/secondary/tertiary (P/S/T) flake type designations early in this process, which are frequently used as shorthand for reduction stages, as insufficient to address this assemblage (not to mention the problems inherent to P/S/T approaches even in an ideal case, see: Andrefsky 2005; Howell 1996). A further challenge to this analysis is the result of assemblage mixing. Most of the debitage present in these samples is the result of multiple overlapping reduction episodes, and both materials were utilized with the aim of producing a range of different tools. This pattern is common to real-world lithic assemblages, and numerous approaches have been tested to disentangle patterns of one type of reduction or another from the noise in the sample (see Shott and Habtzghi 2016 for a discussion of this work).

I address these two challenges via two approaches. First, I present data from one in-situ lithic scatter, from the 020-025cm depth of unit 18E, 18N at SCRI-845 (see description of this context in Appendix B and associated images of the tools reproduced in Figures 18A-18C). This provides a comparative baseline for at least some of the lithic production in the canyon. Second, I evaluate debitage patterns to compare overall reduction sequences for both materials, within multiple subsets of the sample. I utilize cumulative frequency analysis to assess reduction sequences, which has the advantage of addressing the entire assemblage while avoiding some of the ambiguity mentioned previously. Unfortunately, these methods are too broad to address specific types of production directly (which I therefore assess in qualitative, descriptive terms), and even with these methods the Laguna debitage assemblage is challenging because of the small size of the comparative samples.

The first step in this analysis was to assign attributes to components of the assemblage. After evaluating platform facets, flake completion, metric measurements, and other features for inclusion, I focused on metric measurements of debitage and complete flakes, number of dorsal flake scars, and evidence of retouch or utilization. I assigned artifacts into types based on these features:

TABLE 19

DESCRIPTION OF FLAKES/DEBITAGE CATEGORIES IN THIS ANALYSIS

Artifact	Description
Debitage	Broken flakes and angular shatter, missing one or more features of complete flakes (i.e. no bulb/platform, no termination, no complete margins)

Flake	Any complete flake with termination, platform/bulb, and margins present; no constraint on dorsal cortex, maximum of 1 dorsal flake scar; no evidence of retouch or utilization
Flake (biface-thinning)	Any complete flake that includes 2+ dorsal flake scars, generally showing orientation along the same axis; margins lack evidence for retouch or utilization but platforms or terminations can possess signs of utilization associated with the tool from which the flake was removed (Frison 1968); no constraints on cortical material present
Flake (core rejuvenation)	Any complete flake that would otherwise be considered a biface-thinning flake but where flake scars are oriented along multiple axes
Flake (retouched)	Any complete flake with edge damage associated with retouch or utilization, no constraints on the presence of cortical material or dorsal flake scars; may share features with any other flake category
Blade	Any complete flake with parallel sides and a 2:1 length-width ratio; generally geometric in cross-section (primarily triangular, though some trapezoidal); flake terminations vary widely by material type and blade size

These types capture broad classes of flakes and debitage, though some terms (e.g., “core rejuvenation” and “biface-thinning”) imply functional characteristics and are used here for historical reasons rather than a presumption of those specific activities. I define these classes explicitly to avoid ambiguity that plagues many lithics studies (Andrefsky 2005; see Sullivan and Rozen 1985 for critiques of specific technological terms). To avoid some of the problems introduced by mixing error (see Andrefsky 2005), I evaluated the assemblage based on the types defined above, conducting a total-assemblage analysis, including some components while excluding others (see below). This analysis does not directly identify the production of specific tool types (e.g., bifaces or microblades), which are more appropriately addressed via tool analysis in the other sections of this chapter. The goal is rather to identify differences in material types to understand differences in the ways chert and igneous materials were reduced generally. I compare drainage-wide patterns of production in both chert and igneous materials on this basis.

First, I address the in-situ reduction at SCRI-845. The debitage pattern drawn from this context corresponds with the assemblage-level artifact identifications and suggests the use of

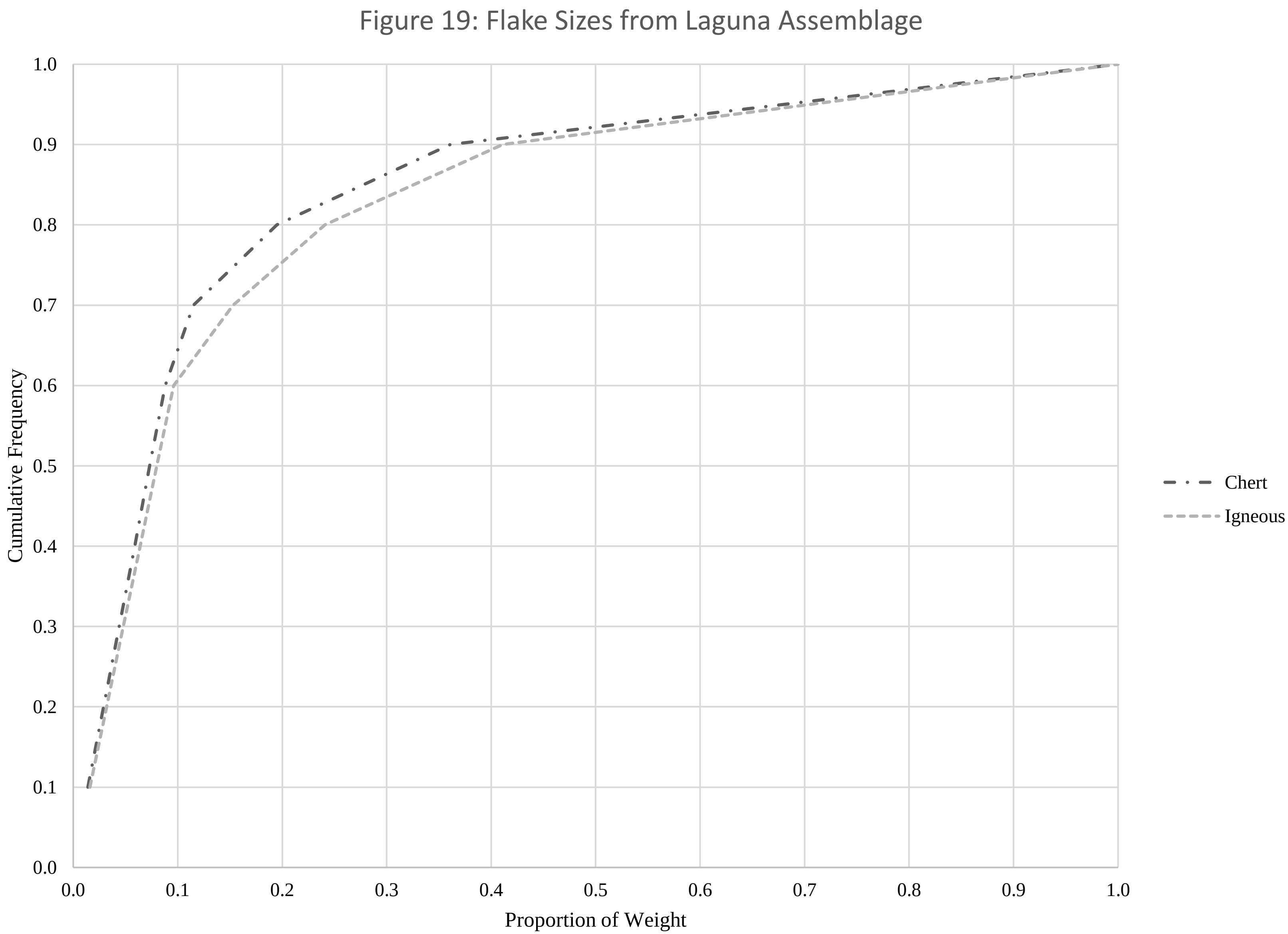
Figure 19: Flake Sizes from Laguna Assemblage
Cumulative Frequency
Proportion of Weight
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Chert
Igneous

chert for biface production, but not local igneous materials. A Mann-Whitney U test identifies a statistically significant difference between the weights of chert and igneous lithics from this context (W = 1779.5, p-value = 2.977e-06), expected based on the greater amounts of small chert flakes/debitage and more chert biface-thinning flakes specifically. These differences are likely tied to the relatively constrained production events represented in this context (idiosyncratic by their very nature) and are difficult to generalize because of the uniqueness of these finds in the Laguna assemblage. Further work on these materials, incorporating more contexts at more sites, is necessary to draw broader conclusions about the use of these materials overall. While this context at SCRI-845 reveals differences in tool production similar to those identified at sites across the region, the debitage throughout the canyon suggests that both materials largely shared a reduction trajectory. Cumulative frequency curves for weights and counts in both materials, which capture differences in debitage from general stages of the reduction sequence, are consistent with patterns evident in late-stage reduction reported for other studies (Andrefsky 2001, 2004; Stahle and Dunn 1982). The data from Laguna support the interpretation that both materials were used similarly at sites in the canyon in this sense (see Figure 19). Other evidence already demonstrates that the materials were used differently in specific contexts (both at SCRI-845 and elsewhere in the region [Pletka 2001a]), but debitage analysis can identify whether the reduction continuum was fundamentally different between the two classes of material or not.

In aggregate, 90% of flakes and debitage (excluding biface-thinning, retouched, blades, and core rejuvenation types), of both materials, fall under 0.4g (see Tables 18 and 19). Some variation does occur, however, between 0.1g and 0.3g, which reflects material differences rather than differences in production process. When considering debitage and flakes, the igneous material is smaller than the chert, a difference partially attributable to the fact that at the lowest

Table 20

Comparison of Middle and Transitional period debitage/flakes

				Chert		Igneous	
Site	Unit	Depth (cm)	Assemblage[a]	Count	Weight (g)	Count	Weight (g)
SCRI-845	15E, 27N	010-020	M	7	2.89	18	77.18
SCRI-845	15E, 27N	030-035	M	30	5.23	42	154.76
SCRI-845	15E, 27N	035-040	M	32	5.25	91	120.58
SCRI-845	15E, 27N	040-045	M	23	14.49	70	44.00
SCRI-845	15E, 27N	045-050	M	31	9.17	82	123.72
SCRI-845	15E, 27N	050-055	M	40	11.61	73	164.89
SCRI-845	15E, 27N	055-060	M	23	10.47	74	277.48
SCRI-845	15E, 27N	060-065	M	16	1.49	38	67.65
SCRI-845	18E, 18N	005-010	M	12	2.20	26	21.46
SCRI-845	18E, 18N	020-025[b]	M	45	66.65	48	102.64
SCRI-845	18E, 18N	025-030	M	68	51.73	75	79.17
SCRI-845	18E, 19N	015-020	M	52	10.56	32	54.89
SCRI-849	13E, 20N	075-080	T/L[c]	4	3.51	2	9.44
SCRI-849	13E, 20N	085-093	T	18	10.66	19	77.27
SCRI-849	13E, 20N	105-110	L-M	7	0.76	47	111.70
SCRI-849	13E, 20N	115-120	L-M	7	1.76	27	64.57

[a] M=Middle, L-M=late Middle, T=Transitional, L=Late
[b] In-situ reduction episode discussed above, all data for individual flakes is displayed in Table 15.
[c] Assemblage from this depth is mixed, but is representative of total debitage/flake counts from post-Transitional contexts

end of the scale (<0.1g) igneous flakes are more prone to breakage than their chert equivalents. Comparing the biface-thinning flake type, a Mann-Whitney U test suggests a statistically significant difference in flake weights, with chert flakes generally larger and heavier than their igneous equivalents (W = 7214.5, p-value = 0.009576; see Tables 18 and 19). This pattern is again likely the result of chert flakes surviving intact while fewer igneous flakes of the same sizes do so, resulting in a reversal of expected weights considering the relative densities of the materials. This supports the null hypothesis that chert is better suited to small tool production.

Despite these differences, the overall patterns convey the same trends in reduction sequence. If igneous tool production focused solely on expedient tools with little refinement the debitage pattern should show a cumulative frequency curve with most of the assemblage at larger sizes. The comparison of these curves supports the argument that, while knappers may have preferred chert for formal tools, the overall use of both materials followed similar patterns. Given this, ad-hoc tool manufacture utilized substantially similar reduction techniques when compared to formal tools during the Middle period despite material differences and the intended final products.

Similarities in reduction sequences, despite higher frequencies of igneous materials overall, disappear by the Transitional period. Production of small igneous tools stops at the end of the Middle period, as those living in Laguna adopt a microlithic assemblage of imported tools. This results in profoundly new patterns of lithic reduction, including the abandonment of local manufacture of igneous microliths. This results in an increase in the size of individual igneous flakes in these contexts, as well as a decrease in the number of chert flakes overall. For a summary of this pattern, see Table 20 (individual flakes measurements are included in tables 22 and 23 in Appendix B). Igneous materials, already more common in all contexts, dominate the flake/debitage assemblage entirely. On this basis I suggest that the production of some tool types in these materials occurred at the same time in the late Middle period (including projectile points and microliths), and that the debitage patterns support the argument that the lack of chert projectile points in the Transitional period deposits does not indicate a lack of projectile point production or use necessarily.

MICROBLADES

The Laguna microblade assemblage conforms to island-wide patterns of the late Middle and Transitional periods, moving from generalized to specialized during that span. Access to SCRI chert in raw form is greater in the late Middle period than the Transitional, a pattern reflected in the appearance of both chert tools and cores (see above). To assess these tools in the context of previous work on SCRI, microliths were assigned into types based on the following features:

TABLE 21

DESCRIPTION OF MICROBLADE/MICRODRILL CATEGORIES IN THIS ANALYSIS

Artifact	Description
Microblade	Any blade (flakes with a 2:1 length:width ratio) characterized by properties associated with detritus from the specialized microdrill industry; divided into undiagnostic, Middle, and Late subtypes (see Arnold 2001a for subtype descriptions)
Microdrill	Any microblade with evidence of retouch (bit creation) or utilization at the distal tip; divided into triangular (undiagnostic), trapezoidal, and triangular with dorsal retouch (TDR) subtypes (see Arnold 2001a for subtype descriptions)

Patterns of microblade production are closely tied to patterns of chert access in Laguna. The expanding specialized island drill industry affected producers in Laguna as it did islanders more broadly, impacting the use and meaning of tools embedded within the larger sociopolitical systems of the late Middle period. Igneous microblades (and microdrills) are present in significant quantities at SCRI-845, in both units (see Table 24). At SCRI-849 these artifacts are common in the lower levels, but over time are abandoned and replaced by nonlocal chert microblades/microdrills. This is particularly true in the upper, disturbed portion of SCRI-849. While it is impossible to assign specific stratigraphic positions to artifacts within that component, there is an absence of local igneous microblades above 85cm depth in 13E, 20N despite their frequency below that level (see Table 24). The introduction of formal microtools may have been connected to the effectiveness of those tools for bead production (see Nigra and Arnold 2013), though the patterns of the Laguna assemblage also support a non-technological motivation. On purely material grounds, the differences between chert and igneous microdrills appears insufficient to explain the total abandonment of the latter type by the Transitional period.

Furthermore, while chert microdrills certainly had advantages over other fine-grained toolstone, the coarse igneous material present in Laguna has important attributes that may have competed with chert. Though somewhat brittle and difficult to work with, producers had easy access to the Laguna igneous materials and could modify them relatively quickly with minimal investment. Producing functional angular shatter and triangular microblades in significant quantities was clearly not a challenge for those living in the canyon during the latter Middle period, based on the debitage assemblage. Artifacts of this type recovered during excavation, however, did not seem to be put to the task of significant amounts of shell drilling. Whatever their specific purpose, however, the production of local microtools greatly diminished by the Transitional period, when they are replaced by nonlocal chert equivalents made outside of Laguna (see Table 24, omitted here due to length but included in the list of tables below).

Nonlocal tools, developing from the intricate web of specialized production and changing connections between and among islanders, were tied to sociopolitical realities beyond their function as tools. As labor relations changed among producers and elites, tools themselves became reified as components of the emerging sociopolitical system. The spread of island chert microliths, and the abandonment of local production of functionally similar tools, is evidence for the value they obtained through time as components of the new sociopolitical order, a development clear in the later components of Laguna Canyon's occupation.

WORKED BONE

Evidence for worked bone in Laguna provides further support for this analysis, suggesting the relative stability of subsistence practices despite profound changes in the total assemblage. Worked bone implements largely support the assignment of the deposits to the late Middle period, dominated by bi-pointed bone barbs/gorges typical for the time (Wake 2001). A list of artifacts is provided in Table 25, and images of selected worked bone reproduced in Figure

TABLE 25

WORKED BONE

Site	Unit	Depth (cm)	Taxon	Item	Count	Weight (g)
SCRI-845	15E, 27N	010-015	Mammal	Gorge/barb	2	0.43
SCRI-845	15E, 27N	025-030	Aves	Whistle	1	1.02
SCRI-845	15E, 27N	025-030	Mammal	Gorge/barb	1	0.98
SCRI-845	15E, 27N	035-040	Mammal	Gorge/barb	3	0.36
SCRI-845	18E, 18N	025-030	Fish	Gorge/barb	8	3.15
SCRI-845	18E, 18N	025-030	Mammal	Gorge/barb	2	2.82
SCRI-845	18E, 18N	030-035	Mammal	Gorge/barb	1	2.42
SCRI-845	18E, 18N	035-040	Mammal	Gorge/barb	1	1.35
SCRI-849	13E, 20N	085-093	Mammal	Gorge/barb	1	0.27
SCRI-849	13E, 20N	115-120	Unident.	Gorge/barb	6	1.62

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17. I also recovered a small number of J-shaped (common at late Middle period sites) and C-shaped (common at Late period sites) shell fishhooks. The latter type come exclusively from the upper components (Transitional and post-Transitional) of the excavation units at SCRI-849. These implements support the interpretation of fishing practices reliant on the same kinds of tackle seen elsewhere on the islands during the same periods. This assemblage from sites in Laguna suggests a subsistence pattern typical for the late Middle period.

SUMMARY

The patterns described above are critical for understanding how individuals living at sites like those of Laguna (i.e. secondary villages, *sensu* Kennett 2005) adapted to changes in island life in the late Middle period (Arnold 2001a; Perry 2004; Perry and Glassow 2015). Future researchers must expand this sample to treat the larger patterns of lithic production in the region holistically, rather than focusing primarily on high-quality chert and relatively refined tool forms. This is especially crucial to understand the changing nature of production through time. Based on this work, these patterns were stable over the span of occupation represented in situ at sites in Laguna Canyon (approx. 600 – 1300 A.D.). The adoption of the Late period systems settlement and production profoundly altered the ways in which local resources were utilized and implies upheaval in both the mode of production and the social relations of production, and it led for the first time in the region to complex sociopolitical structure.

CHAPTER 5 - CONCLUSION

Laguna Canyon provides an opportunity to build on existing work conducted to understand both island interiors and variation in the culturally mediated use of stone tool materials through time (Jew and Erlandson 2013; Perry 2003, 2004; Perry and Delaney-Rivera 2011; Perry and Jazwa 2010; Peterson 1994; Pletka 2001a). Coches Prietos to the east provides the most similar archaeological case (Peterson 1994), and analyses Punta Arena (Glassow et al. 2008) and of sites on the east end (Perry and Jazwa 2010) provide valuable comparisons, but the generalized nature of Middle period sites like those in Laguna continue to present a significant interpretive challenge (Kennett 2005). This project demonstrates the potential for such sites with generally unremarkable diagnostic assemblages to contribute to our understanding of the development of sociopolitical complexity in the region. I addressed this evidence for the renegotiation of the social relations of production that took place during the late Middle and Transitional periods using an evolutionary model that emphasizes the operation of human agency within the developing sociopolitical system. Changes in craft production should be viewed as an effort by those living in Laguna to find a local optimum in both the natural and sociopolitical landscapes of the time. They made choices in response to the same causal impetus that led to the development of specialization at the major quarry sites in the east and the bead production centers in the west, and in the same context of settlement system changes that reoriented life toward the coast (Perry and Glassow 2015). The outcome here was very different, due to both the local environments and to Laguna's sociopolitical position relative to nearby major villages of the Late and Historic periods.

Physically, three important local factors influenced occupation in Laguna: the availability of some freshwater implied by the continued occupation of the canyon during times of interior abandonment elsewhere (Kennett 2005; Perry and Delaney-Rivera 2011; Perry and Glassow 2015); the poor landing at the beach; and the available local resources (abundant vegetation and low-quality toolstone). The Chumash certainly recognized the dangers inherent in the steep beach, unpredictable current, and strong riptide. Rather than risking their lives to land here, an easy stop at Malva Real less than 1km to the west and a short walk over the ridge would have been significantly more practical and much safer and may have conditioned changing chert access during this interval. It is also possible that Punta Arena served as at landing point (Glassow et al. 2008). Despite that obstacle, especially given the increasing reliance of islanders on maritime travel through time, people continued to live in the canyon. They also continued to utilize local resources through the late Middle period, even as the social relations of production on the island changed around them. Their decisions about life in Laguna are therefore illuminating in the context of change happening across the island (Arnold 2001; Kennett 2005; Perry and Glassow 2015).

The density of deposits in Laguna is high in the Middle period. This is especially true at noteworthy at sites like SCRI-843, located 3km inland, compared to areas of similar size and occupational history in Coches Prietos. This period saw numerous sites of this nature, characterized by dense midden deposits composed primarily of *Mytilus* shell and igneous debitage. This pattern shifted in the Transitional period and beyond to occupation at a single site. As discussed above, while other nearby canyons were abandoned, Laguna's occupants remained and continued pursuing locally-oriented production even as the bead industry developed. The contraction of settlement at the onset of the Transitional period represents a context in which maritime resource intensification combined with the expansion of labor control incorporated increasingly large groups into new sociopolitical systems and led to craft specialization and sociopolitical complexity for the first time in the region. Others have suggested that this abandonment of much of the landscape followed broader sociopolitical networks on the island (likely into the best-watered drainages at the time [Kennett 2005]). Individuals of varying degrees of relatedness moved into a smaller number of large sites, a pattern characteristic of the Late period occupation in places like Cañada Christy and Coches Prietos, as well as the other northern Channel Islands (Jazwa et al. 2017; Kennett 2005). In Laguna, this resulted in occupation centered at a single site that more closely connected, ultimately, to Liyam and/or Shawa.

This is equally evident in the lithic assemblage, which in Laguna moves from one dominated by relatively uniform (and ad-hoc) local production in the Middle period to one characterized by the adoption of the typical island Late period toolkit. In the latter part of the Middle period chert was utilized for a relatively small range of tools, while much of the assemblage (including microliths and bifaces as well) was composed of igneous materials. Despite this, evidence for the use of igneous material to manufacture formal tools suggests a single approach to tool manufacture during the late Middle period, and some replacement of chert with local materials as the quality of available chert declined. This pattern may have had its ultimate origins in the deep past because of the culturally embedded value of chert compared to local toolstone. The occupants of Laguna were clearly capable of producing fine work with relatively poor non-chert materials. The significant effort of those in Laguna to use every cubic millimeter of every chert core (via extensive heat treatment of even low-quality material) demonstrates the importance of access to the material for its culturally constructed value. SCRI chert cores present in Laguna are in some cases of lower quality than the igneous cores, yet islanders worked the former until the very end while often discarding the latter with little reduction. A primarily functional explanation is insufficient to explain this pattern. If the goal was tool production, then chert would not have been specifically necessary in Laguna at all in the late Middle period due to the ubiquity and expedience of using local substitutes. The importance of bifaces and non-local raw materials to connections among individuals and communities throughout the region go beyond SCRI alone and extend beyond the bounds of the Chumash world to Baja California and certainly beyond (Arnold 2001a; Des Lauriers 2010; Pletka 2001a; Perry and Jazwa 2010). Microdrills on SCRI carried the same kinds of meaning during the Transitional and Late periods (Arnold 2001a; Dietler 2003; Preziosi 2001). At the same time, the declining quality of chert through time suggests that changing quarry use on the east end strongly impacted the availability of chert cores further to the west on SCRI (Arnold 1987; Perry and Jazwa 2010). Whether this use was characterized by developing resource ownership in the region or by the reorientation of intra-island connections tied to the development of the Late period settlement system is unresolved (Arnold 2001a; Perry and Glassow 2015). The adoption of formal microtools in Laguna, however, demonstrates the increased importance of intra-island connections and identity by the Transitional period (Arnold 2001a; Perry and Delaney-Rivera 2011).

The decisions to move to SCRI-849 and to adopt microblades and microdrills made of chert instead of local equivalents in the Transitional period speaks to the importance of symbolic ties among groups of islanders and the embedded material culture expressions that reified those relationships, rather than strictly to features of the technology itself or the pursuit of bead production as a specialization. On the east end, where similar trends are seen, the interaction among settlement patterns, resource use, and intra-island networks of communication and connection led to increasing specialization of microdrill production (Perry 2004; Perry and Jazwa 2010). These patterns, and the parallels to patterns of long-term corporate kin-group ownership at Keatley Creek investigated by Hayden, provide clues to the possibility of sociopolitical dynamics of the late Middle period prior on which the bead industry would later build (Arnold 1987, 2001; Hayden et al. 1996). Researchers must continue to address this fundamental question to understand how individuals navigated the complex landscape of upheaval characterizing the late Middle period, and how archaeological data can address the factors underlying these changes in the material record (e.g., Gamble 2017; Kennett et al. 2013).

Both the natural and cultural environments of the islands provided a context within which islanders made decisions about how to invest their labor. Despite the broader regional changes of the late Middle and Transitional periods, those living in Laguna chose to stay in the canyon rather than abandoning it. As islander toolkits transitioned alongside settlement systems in the Transitional period, they chose to attempt to adapt local resources to participate in this change in their own ways. This is parallel to patterns seen in contemporary east end quarry use (Perry and Jazwa 2010). The record of Laguna provides another example to demonstrate the variability of strategies that the Chumash pursued in this context. It also further illuminates one possible path not taken, in which participation in emerging island-wide systems of production could have been predicated on local resources into the Late period rather than on the chain of specialist products that ultimately developed. Laguna (and the record of lithic production on SCRI generally [e.g. Perry 2004]) demonstrates that cultural evolution is not teleological. The bead industry did not develop along a predetermined path out of Middle period lifeways, though rooted in the ways in which islanders lived during that period. I emphasize the value of studying Middle period sites in this context because the record of Laguna complicates our picture of the past but also serves to confirm the fact that the roots of specialization and sociopolitical complexity were deeply seated in the lives of the Chumash before the Transitional period (Perry and Glassow 2015). Those patterns had simply not yet developed into complexity. This argument can be tested by future excavations focused on the Middle period, on both islands and mainland. Currently, the archaeological record is simply more complete from large coastal sites, both before and after the Middle period. The abundance of sites through the Middle and (the beginning of) the Late Holocene is followed by an abandonment of island interiors (Perry and Glassow 2015). This likely reflects real stresses that occurred at the time, with parallels on other islands (Yatsko 2000). Though SCRI was never abandoned entirely like SCI, further study in areas like Laguna will provide insight into the dynamics of this period.

Laguna Canyon is one drainage on the south side of SCRI, in which a small number of small sites are located. On its own it cannot, and does not, provide data on the scale necessary to evaluate the scope of settlement dynamics and sociopolitical changes on the island during either the tumultuous late Middle period or the brief but critical Transitional period. In combination with meticulously documented evidence from a broad range of sites on SCRI (Arnold 2001a; Perry and Jazwa 2010; Perry and Glassow 2015), this assemblage contributes data that illuminates larger changes on the island and the first steps into sociopolitical complexity. Substantial descriptive and interpretive work can still be done to expand the record of this occupational history, considering both these researchers' observations and the Laguna assemblage.

The focus of my analysis on SCRI should not be taken to mean that I hold the position that that island was necessarily the center of this transition. The role of islanders in these changes may have been central or it may not have been. The Middle period on the other northern islands, as well as on the mainland, is a perfect period to study for researchers hoping to understand the nature of sociopolitical change through time in the region. SCRI has been blessed with excellent preservation of sites and thorough documentation of its archaeological record over the past half-century of research. Ultimately, scholars must cast a wide net beyond chert and beads to truly understand how life changed in the broader region during the first millennium AD. Researchers must emphasize a holistic approach to change through time that works to establish the ways in which this time and this place set the stage for the renegotiation of sociopolitical dynamics on an evolutionary scale, with implications for the development of complexity everywhere.

Appendix A - Methods

Survey Methods

I followed standard survey and excavation methods common to archaeological practice in the region. Shell midden sites characteristic of SCRI rarely possess obvious features beyond house depressions, and the lack of prominent features to constrain excavation units has led to the adoption of specific sampling strategies. I employed survey methods adapted to the variable constraints imposed by different local vegetation, topography, and ground visibility during the initial work, followed by augering and excavation sensitive to the conditions of each site under investigation.

I conducted the initial canyon survey by employing three distinct sets of methods for different local environments. First, I identified sites by walking transects with a crew of three volunteers in all available open space in the canyon not totally obscured by mule-fat scrub, coastal marsh and estuary, and herbaceous riparian vegetation. Second, I visited every visible rock shelter or overhang present in the canyon, recording any observed cultural material at such sites and while in transit to or from them. Third, despite the dense mule-fat scrub in many parts of the center of the drainage, I attempted to sample limited areas of the canyon bottom itself by systematically clearing small sections of brush to improve visibility.

Transect survey is common to archaeological work the world over, including in many parts of SCRI (and the other Channel Islands) where random sampling of a generally flat landscape is possible. In Laguna Canyon, unfortunately, areas suitable for this type of survey were limited compared to the size of the canyon as a whole. In spite of this, the survey work covered essentially all open areas in the canyon with slopes of less than ~15% that could be walked in transects. These areas were not present in the canyon bottom necessarily, as some flat expanses of coastal-sage scrub are present at elevations as high as 200m in select areas of the canyon. Due to thick grass and shrub groundcover, visibility in these sections of the canyon is very poor, so during these transects each member of the survey team exposed soil every 5m to identify possible sites. In order to test whether this was sufficient to identify site deposits in the canyon bottom, where successive flood events have deposited huge amounts of material scoured from the higher reaches of the drainage and may have buried site deposits, I excavated 11 auger units in two transects in the center of Laguna (see Figure 20). These auger unit transects were situated in the center of the largest open area of the canyon, one running 47m at 22˚ and the other 50m at 268˚. Coordinates for the center point where these transects crossed are noted in the map (see Figure 20). These augers yielded no cultural material despite penetrating to a depth of 2m before being stopped by rock. Based on the cut bank closest to the auger transects, it was a layer of large conglomerate cobbles at 2m depth prevented further augering. None of these augers produced any cultural material, suggesting that whatever sites may have been present at some point in the past have long since been destroyed by the degradation of the canyon. The current course of the channel (and the road) in Laguna is poorly constrained, cutting through unconsolidated Quaternary alluvium characterized by large flood events visible in the stream banks. The road changed course in minor ways at least twice during my fieldwork in the canyon because of this.

Friable light-colored brecciated tuff of the middle and upper members of the Sierra Blanca formation composes the western side of the lower reaches of Laguna Canyon, while slightly more stable tan- or buff-colored conglomerate bedrock of the upper member of the Blanca formation composes the majority of the eastern side of the canyon (Dibblee and Minch

2001a, 2001b; Weaver 1969). Both components produce rock overhangs undercut by erosion, resulting in a large number of rock shelters throughout the canyon, from coast to the interior. Islanders commonly occupied shelters such as these in the Middle period, and during the survey design I considered them likely to have sites associated with them (see Peterson 1994). I surveyed more than 200 rock overhangs, shelters, and caves during the project, only a small handful of which were associated with any midden. Unlike Coches Prietos, Laguna was disappointingly bare. Most sterile rock shelters possessed sloped floors and would not have been suitable for occupation even had they been present in prehistory, but the remaining sterile shelters may lack midden in the present as a result of a combination of factors. First, many of the suitable caves and shelters had clearly been occupied at some point by ranch stock. I frequently identified *Ovis aries* horns and *Sus scrofa* elements in these locations, left over from the eradications at the turn of the century. Use of the caves by animals likely disturbed any midden present, illustrated by surviving deposits at SCRI-852 (discussed below). Second, erosional processes generated the thick deposits of alluvium in the canyon bottom by scouring the canyon walls of soil and by breaking down the bedrock, exacerbated by the lack of ground cover during the latter half of the 20th century (if not earlier; see Perroy et al. 2010 for more discussion of gullying and erosional dynamics on the southwestern side of SCRI). Though there is no way to definitely know the history of the canyon or the taphonomy of any sites that may have existed in the early 19th century, I suspect that the eighteen intervening years between Peterson's 1994 survey and my work in 2012, which includes the 1997/1998 El Niño event and the final removal of the ranch stock, may have been a critical period when sites were lost. The period from the late 19th century to the 1930s, however, seems to have been the most destructive in terms of potential damage to sites (Perroy 2009; Perroy et al. 2010).

With the final, and most limited, form of survey I hoped to evaluate the areas of the canyon choked by mule-fat scrub in locations suitable for occupation. Some limited brush clearance was possible, generally aimed at creating stable paths to access sites along the canyon edges, and during the first phase of survey in the canyon these paths were check for site deposits. The thickness of the brush, the limited clearance and visibility, and the low available manpower, however, quickly ended any attempt to address the canyon systematically in this fashion. Those areas that were cleared resulted in the identification of no site deposits, most importantly in the areas adjacent to the coastal marsh near the mouth of the canyon (see Figure 21).

Subsurface Testing Methods

I utilized augers throughout the canyon during site recording to evaluate the subsurface deposits present in the canyon and to assess the distribution and nature of its occupation. Researchers in the region have demonstrated that augers capture significant data concerning site contents without requiring excavation, and accurately characterize occupational histories except in rare circumstances (Arnold 1987, 2001b). After mapping the sites themselves with compass and tape as well as GPS, auger units were located in crossed transects. I oriented each set of transects so that one would align with the long axis of the site itself and that the other, perpendicular to the first, would capture its maximum width. I used hand augers with a diameter of 5cm and a 10cm-deep bucket. Augering progressed until 20cm of sterile soil, the unit reached bedrock, or until the soil was too loose or too rocky to continue effectively. At sites with deposits too shallow, too rocky, or too disturbed for augering to be of use, I collected material in trowel test units measuring 5cm by 5cm. These units never progressed beyond 10cm depth at any site in this study. Flotation samples were collected for each auger unit, processed at the UC field station on SCRI. After washing, I sorted the material collected via augers in the lab, primarily during 2012 and 2013.

I employed excavation methods at two sites where auger units identified likely in situ material and where stable deposits had potential to significantly contribute to the understanding of the canyon. Excavation units were 1m x 1m square, dug in arbitrary 5cm levels from the surface until 20cm of sterile soil, or bedrock, was reached. In all cases, the units in Laguna reached bedrock. Each level was sifted through both 1/8” and 1/16” mesh in the field, which has been shown to be necessary in order to capture beads and debitage in California shell midden (Arnold 2001a). I bagged all material from the sift, from both sets of screens, for lab analysis at UCLA. I also collected a total soil, 20cm x 20cm column sample at SCRI-849 in 2cm levels to preserve soil contents and potential microbotanical remains for future analysis. This column sample has not yet been analyzed.

LITHIC ANALYSIS METHODS

Archaeologists have focused intensely on stone tools because of both the reductive nature of lithic technology and the ubiquity of its products globally. Debitage, detritus, flakes and tools of all kinds provide physical evidence of individual acts of tool production in the past, though their nature, duration, and intensity are often ambiguous. Though the repeated and varied use of both individual sites and individual artifacts makes analysis challenging, stone tool production is a critical avenue by which archaeologists can evaluate labor investment in past societies.

Reduction sequences have been used to track technological changes through time in specific techniques or cultural groups, tracing specific patterns of manufacture through time (e.g., early Holocene Paleoindian lithic traditions in North America broadly). This approach originates in the work of W.H. Holmes in the late 19th century but is still in heavy use today (Andrefsky 2005; Holmes 1894, 1919; Odell 2003). Other approaches (e.g., *chaîne opératoire*) developed more recently build on this concept, but largely exist in parallel to it (Sellet 1993). The analytical value in reduction sequence analysis lies in the promise of identifying specific techniques or stages of manufacture, allowing the archaeologist to create a typology of cultural patterns of production on multiple axes. Unfortunately, reduction sequences in themselves are difficult to reconstruct outside of favorable circumstances, often requiring replicative experiments to provide baseline data. Confusion within mixed assemblages also arises from multiple causes: taphonomy, production history, site use, and existing patterns of material procurement and consumption. The Frison effect, recognized since the 19th century but first formally named in the 20th, can also significantly impact the morphology of tools through their use-lives, with the result that tracking the history of individual artifacts or establishing typologies is further complicated (Frison 1968). The idiosyncrasy of individual choices and the morphological continuum on which tools exist significantly complicate these problems, although replication of tool technologies has filled some of the gap.

As replicative experiments have multiplied in the wake of Crabtree's work from the 1960s onward, greater attention has been paid to the properties of different types of stone, to technique, to core and edge preparation, and to the manner in which choices by individual knappers guide the development of technology (Crabtree 1968, 1972, 1975). Raw material properties are intricately tied to these individual patterns and techniques, forming the foundation on which the social relations of production are constructed through time. Choices on the part of knappers, for example between formal and informal tool types, is linked to these variables as well, with a trend from less formal to more formal as materials progress from lower to higher quality and more formal production as lithic resources become more constrained (Andrefsky 1994a). Two axes of material property are commonly used in lithic analysis to understand these constraints: high-quality/low-quality and abundant/rare (Andrefsky 1994a). The link between high-quality material and formal tools is not always direct, however. Examples of formal tool production utilizing quartzites and other low-quality materials, as well as selectivity among "low-quality" stone and the frequent use of informal tools in place of formal ones, are abundant in some regions where chert or obsidian are relatively rare or constrained (Andrefsky 1994a, 1994b; Brantingham et al. 2000; Holmes 1890; Flenniken and White 1985; Stout et al. 2005).

One means by which lithic producers addressed a lack of regular access to high-quality toolstone was by conserving such materials. By volume, microblades and microdrills are an efficient means of producing the greatest amount of useable tool edge with the least waste and smallest amount of material possible (Andrefsky 2005; Bamforth 1986). The invention and use of microlithic tools long predates human occupation of the New World, dating to at least 70kya (Ambrose 2002), though small tool traditions were well developed in the Americas, as Alaska, the Mississippian southeast, and elsewhere attest (Ackerman 1992; Holmes 1919; Jayez 2015; Mason and Perino 1961; Soriano et al. 2007; Yerkes 1983; Wenzel and Shelley 2001). In the Santa Barbara Channel region, this is seen both in the development of the standardized microdrill industry in the Late period, and also in the use of chert for formal tools beginning in the Early Holocene (Arnold 2001; Jew et al. 2013b). While these patterns are relatively clear for chert, no similar analysis exist for the low-quality materials, including the Laguna lithics. Assemblages composed primarily of production detritus with few finished tools, like the Laguna assemblage, make the identification of such processes impossible. Laguna possesses little evidence of curation or reuse over the lifetime of individual tools, due to the informal nature of work there and local raw material abundance.

Aggregate analysis of debitage and flakes has the potential to address this problem for the Laguna igneous material, identifying patterns of production and permitting comparison to regional chert use. Work in debitage analysis over the past two decades has significantly advanced our ability to distinguish types of reduction from one another (Bradbury and Carr 1999; Carr and Bradbury 2001; Shott and Habtzghi 2016). Aggregate analyses focused on size- or weight-classes can be enhanced when assemblages are viewed as continua (rather than discrete reduction steps), combined with information recorded for individual flakes composing the assemblage (Bradbury and Carr 1999; Carr and Bradbury 2001, 2004; Steffen et al. 1998).

I treat debitage analysis as representative of a continuum of activities from initial raw material to finished tool and associated debitage (Bradbury and Carr 1999; Shott 1996). In evaluating the Laguna material, I combine individual flake features with aggregate analysis. This approach has the advantage of distinguishing core reduction from tool production, as well as providing context for subjective flake assessments (Andrefsky 2005; Bradbury and Carr 1999). I analyze multiple subsets of the Laguna assemblage individually to assess the types of production in the assemblage as a whole as well as production with specific material types. I evaluate complete flakes (flake typology discussed above in the assemblage analysis section) for production patterns. For this analysis I recorded the bulb thickness, weight, and overall maximum flake length, width, and thickness of each artifact. Flakes and debitage were graded by weight, in 0.1g increments.

I primarily use two statistical methods in this analysis: the Mann-Whiteny U test to compare populations of different material types to one another and cumulative frequency curves to assess evidence for reduction sequences in the debitage assemblage. The former test is non-parametric and does not assume that the underlying population is normally distributed. This is advantageous in this case because lithic reduction sequences lead to highly right-skewed distributions, dominated by small low-weight artifacts as finished tools and large, useable flakes are removed from the sample. The Mann-Whitney U test does not require samples of equal size to determine whether they were drawn from the same population, and the sample size requirements for statistical validity are smaller than with Student's T-test or Chi-squared tests. The second set of tests I used were cumulative frequency curves. These simple assessments of the population of debitage can identify large-scale patterns in reduction sequences when comparing material types (Andrefsky 2005). Different activities (core reduction, biface manufacture, uniface manufacture, etc.) yield different frequency curves, making them a means of comparing sub-assemblages to one another broadly when issues like assemblage mixing and material variation are otherwise challenges to analysis.

One critical future avenue for research on the Channel Islands will be to evaluate assemblages composed of multiple local materials of varying quality. Importantly, this requires significant replicative work aimed at identifying core reduction, biface manufacture, and unifacial retouch more precisely than existing artifact typologies permit. For the igneous assemblage one critical question is the role that manufacturers played in choosing among cobbles with varying porphyritic and aphanitic textures, in terms of the functionality of finished tools, differences in reduction sequences (see also Stout et al. 2005), and the relationships between local and nonlocal materials based on differences in material types (a productive comparison for which is provided in Andrefsky 1995).

APPENDIX B – SITE DESCRIPTIONS

One of the initial goals of the survey was to confirm the location of some sites recorded by Olson during coastal survey of the island in the early 20th century. In pursuing this objective, I recorded a very different pattern of occupation than suggested by that initial work. I reconfirmed five of the sites recorded near the mouth of the canyon: B116 as SCRI-846; B114 as SCRI-849; B115 as SCRI-847; B118 (listed as B113 due to a copying error on the original survey form) as SCRI-846; and B113 as SCRI-845. Three sites could not be relocated: B112, B117, and B119 (B119 may have been subsequently identified in 2016, however [Kristina Gill, personal communication]). SCRI-387 was also reconfirmed, situated in a stable position north of SCRI-848. SCRI-115, SCRI-116, and SCRI-117 (confusingly, the SCRI trinomial sites, recorded much later, happen to use the same three-digit numbers as the earlier Berkeley site trinomials; all of these later sites are perched on the western ridge separating Laguna from Malva Real) could not be located. It is likely that these sites have eroded into the drainage, as that ridgetop has been heavily damaged and is still nearly devoid of significant ground cover. As described in the literature, similar ridgetop sites (e.g., in Coches Prietos [Peterson 1994]) were mainly exposed lithic scatters and, as a result, susceptible to erosion. In Laguna, I added five new sites in the canyon to this total, two of which had already been recognized in 2011 but not formally recorded (Kristina Gill, personal communication).

The occupational history of Laguna has strong parallels in both other drainages on the south side of SCRI and in regional settlement dynamics of the first millennium more broadly (Perry and Jazwa 2010; Peterson 1994). Though the changes of the late Middle and Transitional periods appear to have impacted individual drainages differently (e.g., Coches Prietos vs Posa

Creek vs Laguna), a consolidation of sites from a broad distribution on the landscape to a relatively smaller number, generally nearer the coast, is the typical trend. Laguna saw a decline in overall site density during the late Middle period, and substantial occupation seemingly only at a single site during the Transitional and Late periods. Below, I address each site recorded in this study individually, with respect to site location, local environment, and contents.

SCRI-843

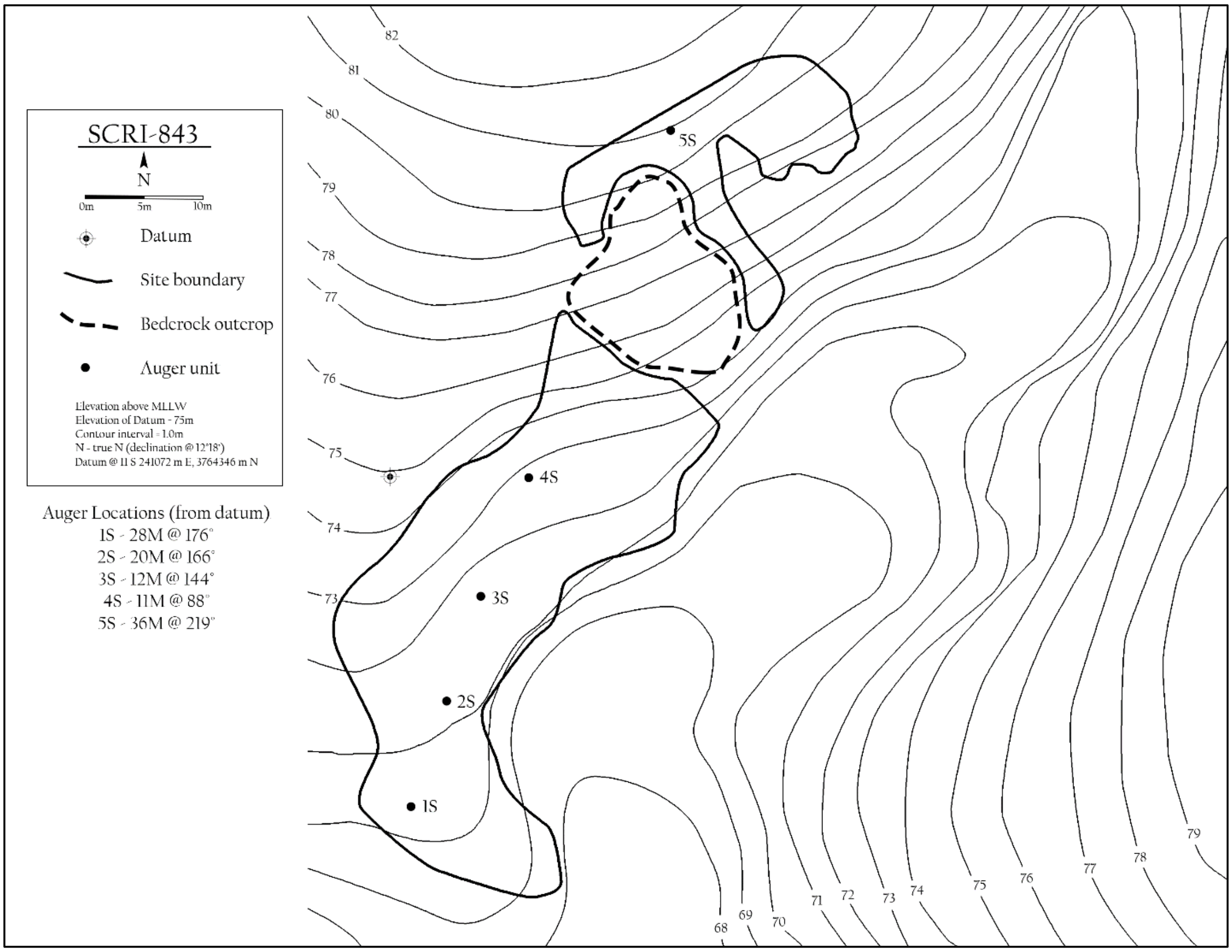

FIGURE 1: MAP OF SCRI-843

SCRI-843 is the most frustrating site in Laguna. The density and depth of deposits here exceed that of many other sites in the canyon, save for the largest intact deposits at SCRI-845 and SCRI-849. Unfortunately, the entirety of the dense site deposit is eroded. As a result, none of the midden has secure context, and stratigraphic profiles from the cut bank located on the southwest edge of the site indicate size-sorting of the midden consistent with large-scale water transportation of the material. The main extant site deposit has slumped into the creek bed, where subsequent erosion has cut it and exposed a profile more than 80cm deep (see Figure 4). The long axis of the main deposit of the site is oriented at 26˚ and measures 45m. Augers were oriented along this axis to capture much of the deposit. A smaller, thinner deposit located precariously upslope on exposed bedrock is oriented in the same direction and measures 13m. The greater angle of the slope in this portion of the site is the probable cause of its small size. Auger unit locations relative to the site datum are recorded in Figure 3, and a profile of the eroded deposit evident in the cut bank is shown in Figure 4.

Two different topographies characterize the immediate environment of the site. Upslope from the site deposit itself is largely exposed bedrock covered by sparse coastal-bluff scrub, with scattered *Eriogonum arborescens* growing on the slope. Groundcover on the site itself is coastal sage scrub, dominated by bunchgrasses and *B. pilularis*. The nearby canyon bottom contains intergraded mule-fat scrub and minor riparian herbaceous vegetation communities, hosting a diverse array of anthropologically relevant plant species. The exploitation of these resources is one compelling potential explanation for the occupation at SCRI-843, and terrestrial drought may have impacted the distribution and availability of those resources in the Middle period enough to lead to abandonment of the site before the Transitional period.

Based on the size-sorting seen in the cut bank exposure and the lack of clear in situ deposits, SCRI-843 appears wholly eroded. Microblades recovered from the site are few, falling largely into the triangular undiagnostic category (*n*=5). One trapezoidal microblade and one trapezoidal microdrill were also recovered. No callus beads were recovered from augers at the site, with a small amount of Olivella detritus (*n*=7, *w*=1.0g) and a single wall bead (E1a1). Midden weight is relatively high in the upper levels of auger 2S (see Table 26), dropping from

701.50g in the 20-30cm depth to 223.70g in the 40-50cm depth. This is comparable to augers at SCRI-845 (e.g., above 60cm in auger unit 4S, with average midden weights of 701g/level; though below that depth weight increases above 1500g/level). Other auger units at SCRI-843 are both shallower and less dense (see Table 26). Site deposits comprise a diverse range of shellfish, though between 95% and 99% of the assemblage by weight is *Mytilus californianus,* across all five auger units. Acorn barnacles (*Balanus sp.*) are most common after mussel. Small quantities of other species are also present: *Strongylocentrotus spp., T. funebralis,* various limpets (e.g., *Acmaea scutum* [as well as other *Acmaea* limpet species], *Fissurella volcano, Megathura crenulata, Lottia spp.*), *H. cracherodii, P. polymerus,* chitons, and two pieces of *T. stultorum*.

No Transitional material was recovered from the site and the lack of temporally diagnostic patterns in shell distribution support an occupational history at least during the late Middle period that ended after the introduction of Trapezoidal microdrills, before 1150 A.D. Further testing, including radiocarbon dating, would clarify the history of the site. Unfortunately, the disturbed nature of the deposits limits the potential value of such testing without larger excavation to understand the stratigraphic relationships of the deposits.

SCRI-844

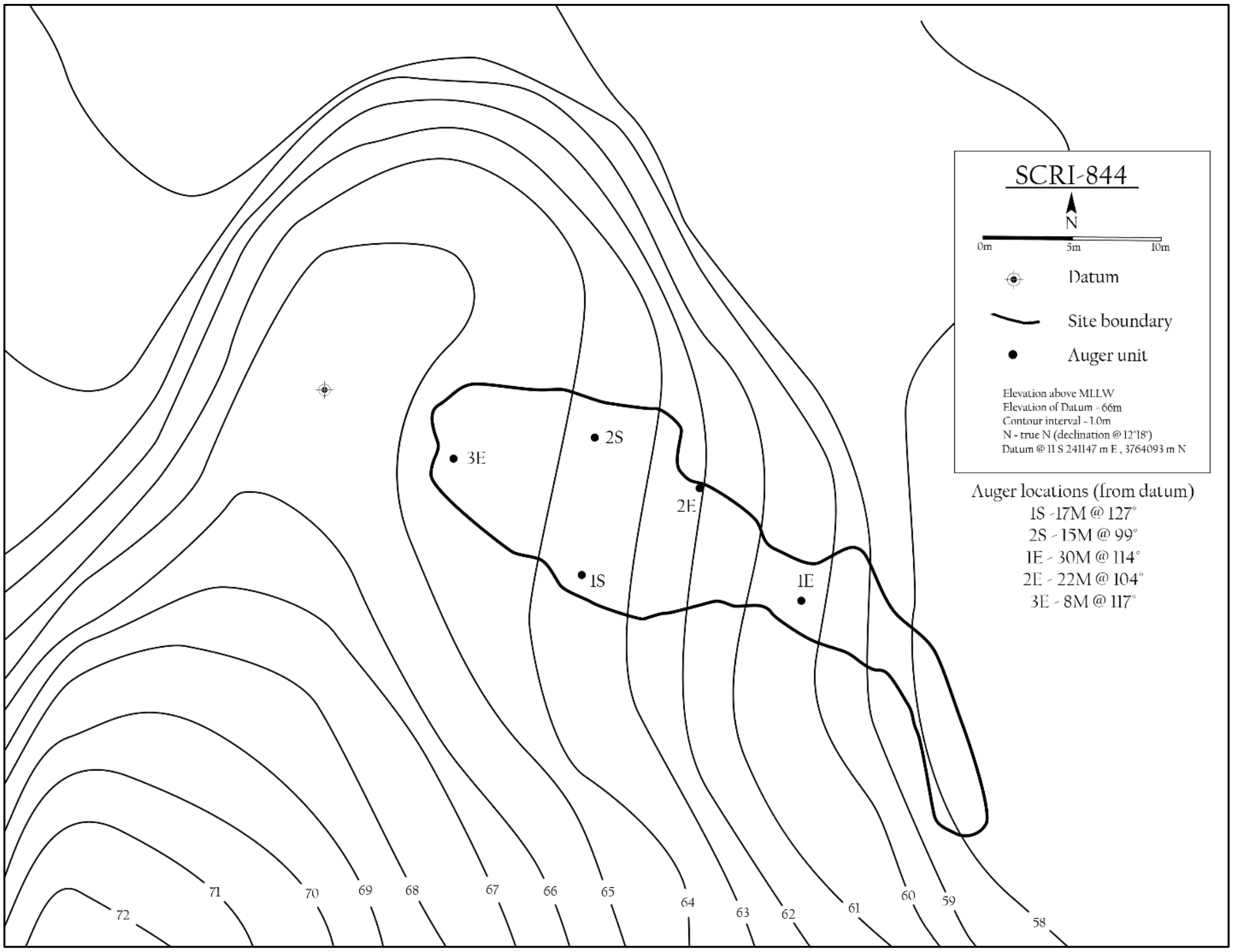

FIGURE 5: MAP OF SCRI-844

Significantly smaller than SCRI-843, SCRI-844 nonetheless yielded surprisingly large concentrations of midden in its limited extent. Mule-fat scrub is common here, both on the site itself and in the adjacent drainage channel. SCRI-844 is situated to the west and approximately 5m above that channel on the end of a rocky ridgeline. At its greatest extent, from the western edge of the upper portion of the site to the eastern end of the eroding material in the channel, the site measures 41m and is oriented at 307˚. The western edge of the site is generally more intact and possesses deposits slightly greater than 90cm in depth, while the eastern side clings to the slope and terminates before 30cm.

The eastern portion of the site is heavily eroded, with a long tail of midden extending into the channel. This tail is being undercut from the site itself, which is located somewhat precariously on the upper slope of the ridge (see Figure 5). Like many similar small sites, *M. californianus*, composes the bulk of the assemblage, suggesting a Middle period occupation. Like SCRI-843, erosion has heavily damaged the site and it possesses no evidence for a Transitional or Late period occupation (though radiocarbon dating would provide data concerning the span of its occupational history). Unlike SCRI-843, however, no diagnostic artifacts were recovered during survey, making the assignment of SCRI-844 a question of general patterns in midden composition rather than one of definitive determination. Future radiocarbon dating would clarify this problem.

SCRI-845

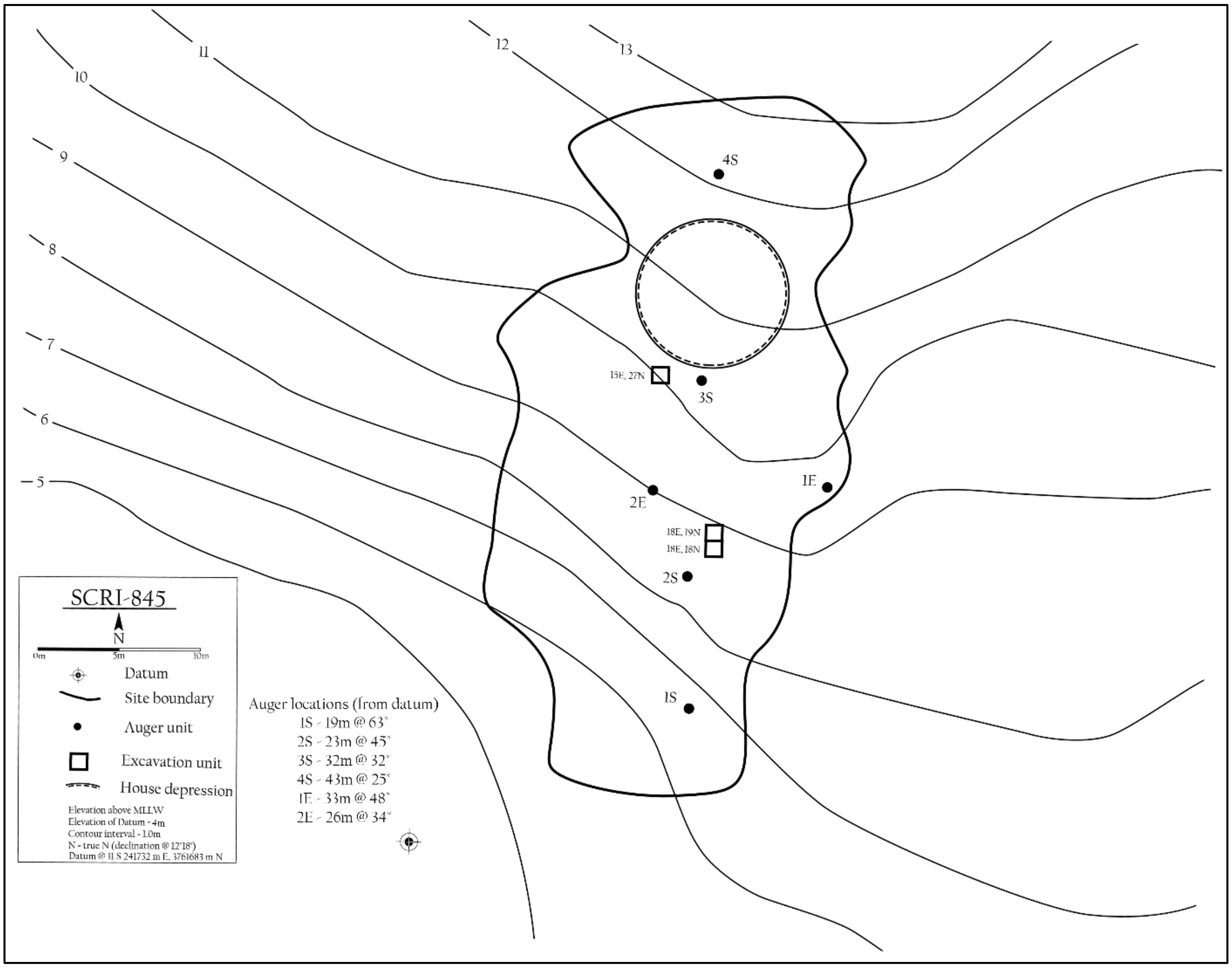

FIGURE 6: MAP OF SCRI-845

One of two sites excavated beyond augering during this project, SCRI-845 is the only site in the canyon with significant undisturbed components. Originally recorded by Olson as B-113, the surface of the site is relatively stable, with one shallow house depression evident (Olson 1929). The long axis of the site is oriented at 10.70˚, measuring 37m in length and 19m in width (see Figure 6). The site overall is gently sloped, and the vegetation is characteristic of coastal sage scrub communities, with *D. wrightii* present as well. The site immediately overlooks the beach, with a view of Gull Island south of Punta Arena (the smell of which often drifts over the site, carried by the onshore breeze in the late afternoons). The location is somewhat exposed, and sudden shifts in the weather often make SCRI-845 cold and windy on summer afternoons. Fall is more temperate, though still subject to rapid turns in weather, signs of which are often concealed by the high ridges both west and east of the site.

During the canyon survey, I placed six auger units at the site. In subsequent work, 2013-2015, this total was supplemented with two excavation units (one 1m x 1m, one stepped 2m x 1m). Auger unit locations relative to the site datum are recorded in Figure 6. The auger units capture the broad composition of the site: high density shell and bone near the observed house depression; proportionally more lithic materials to the southwest on the extended midden-covered slope. Two excavation units, one located on the outside edge of the house depression and the other on the slope, further clarify the spatial organization within the site as a whole.

Auger units 1E, 2E, 1S, and 2S contain less midden per level but more flake stone artifacts, whereas the converse is true in auger units 3S and 4S (near the house depression itself). Auger units 3S and 4S produced unusually large numbers of tarring and cooking pebbles compared to other augers throughout the canyon, supporting the interpretation of the observed house depression as a feature rather than the result of taphonomy (e.g., a cattle wallow, resulting from the historic castration corral). Conversely, a discrete lithic production event recorded in situ from excavation unit 18E, 18N (near auger unit 2S) suggests that this portion of the site represented an activity area in front of the house itself. I address these two areas of the site individually below.

Auger and excavation units near the house depression yielded a rich assemblage only rivaled by the densest levels at SCRI-849. Midden weights in the upper levels of auger units 3S and 4S were relatively low, between 200g and 400g, but increased to 1787g at 70-80cm in unit

4S, the densest midden concentration from a single depth in any auger unit in Laguna (see Table 26). The excavation of unit 15E, 27N likewise resulted in the highest weights per unit of any in the canyon, with seven of the ten densest levels from any Laguna context. The 35-40cm, 45-50cm, and 55-60cm depths each produced more than 20kg of midden, with the 50-55cm level producing a further 16kg (see Table 27). Profile drawings for 15E, 27N (see Figure 7) illustrate the high density of the deposit. One component of this unit is a pit feature lined with whole *H. cracherodii* and containing a large asphaltum cake, located between 25cm and 35cm in unit 15E, 27N. The preservation of these deposits is attributable to the high density of the toss zone adjacent to the house depression, where all three of these units were located. As with sites discussed above, however, most of the material represented is *M. californianus*, composing between 95% and 99% of the shell content of the midden by weight. Acorn barnacles again were second in frequency, with other species appearing in small amounts. The 30-35cm depth yielded large amounts of *H. cracherodii*, associated with the pit feature, while *Strongylocentrotus spp.*, various limpets, chitons, *T. funebralis*, and *O. biplicata* were present throughout these units (see Tables 5, 6, and 27).

The faunal remains present in these units are largely composed of osteichthyes, primarily *Sebastes*, *Perciformes*, and *Semicossyphus pulcher* (I have not identified the majority of the faunal material to genus/species level, but individual elements indicate the presence of these species, if not their frequency in the deposits). Bird and mammal are rare, though some juvenile *Otariidae* elements are also present (e.g., a scapula with unfused epiphysis in the 75-80cm level of unit 15E, 27N). Nearby sea mammal haul-outs, still in heavy use today, were likely an additional draw in the spring and summer months when young animals would have provided relatively easy targets.

A different pattern altogether emerges when considering the units located away from the house depression. The relatively low density and poor consolidation of this portion of the site impact this distribution, with the use-history of the site reflected in deposition and preservation. The remaining auger units and excavation units 18E, 18N and 18E, 19N, possess lower density midden overall when compared to those associated with the house depression (see Figure 8). Apart from an in situ lithic scatter at 23.5cmbd in 18E, 19N, no major in situ features were observed in the profiles of the excavated units. These units did, however, contain higher levels of flaked stone artifacts than the units near the house depression, with the largest number of island chert cores recovered in the 18E, 18N and 18E, 19N units. The largest individual flakes and cores of island chert come from this component of SCRI-845, indicating its unique position among sites in Laguna. While it may not have been the only such locus of production in prehistory, its preservation makes its assemblage unique in the canyon today.

SCRI-845 is most interesting in terms of the span of its occupation in the context of this lithic production in the canyon. Radiocarbon dates from 15E, 27N place activity at the site between ~600 A.D. and ~900 A.D. (see Table 1). Artifacts confirm this, with microliths and beads both falling in established Middle period types (Arnold 2001; King 1990). The site's relatively abundant chert cores and large chert flakes are also characteristic of the later Middle period, before access to raw chert in the form of cores was restricted to those living near the quarries on the eastern side of the island (Arnold 1987). When taken together with SCRI-849 (discussed below), the assemblage at this site supports the interpretation that Laguna's occupants eventually lost access to chert in sufficient quantities to produce tools from that material locally, but that SCRI-845 was largely abandoned prior to that development. This abandonment, and subsequent relocation to SCRI-849, is seen in other areas on SCRI during this period (notably between SCRI-474 and SCRI-475 in nearby Posa Creek). A desire to move slightly further inland to be protected or hidden from view of the sea or an emphasis on resources located slightly further inland may have contributed to the abandonment of SCRI-845. Ease of access to Malva Real and/or Punta Arena, with better landings for watercraft than Laguna itself, may have been significant as well. The small size of SCRI-845 compared to many other coastal middens, and its abandonment during this period (in contrast to Posa Creek, for example, where settlement simply shifted from one side of the creek to the other during this period [Arnold 2001]), are likely responses to the need to travel into and out of Laguna overland. This is especially important in light of the location of SCRI-849 at the foot of the easiest path, close to the beach, leading over the western ridge to Malva Real. Another potential advantage of the less-coastal location of SCRI-849 is its protection from the shore, yet relative proximity to the beach and the largest source of freshwater evident in the modern canyon, making it a prime location to inhabit if shifting weather patterns, terrestrial access, and the potential for interpersonal conflict made the latter site less desirable.

SCRI-846

This site is a small lithic scatter composed of two island chert flakes, located in an area where Olson reported a site (B116). The entire locality is exclusively exposed bedrock, with no vegetation cover. The nearest vegetation is a mixed coastal marsh and herbaceous riparian community immediately below the exposed bedrock. Upslope, the typical coastal-bluff scrub dominates. Any significant midden or shell component to the site that may have been present in the late 1920s has been swept away since the original survey work, likely into the marsh itself, but the recovery of flakes at this locale demonstrates the susceptibility of sites to near-complete destruction in the southern portion of the canyon. The damage caused by ranching and climate change on the island has been reviewed extensively elsewhere (Rick et al. 2006), and Laguna serves as a stark reminder that inland sites are as susceptible to destruction as those on the coast, albeit from a somewhat different balance of processes.

SCRI-847

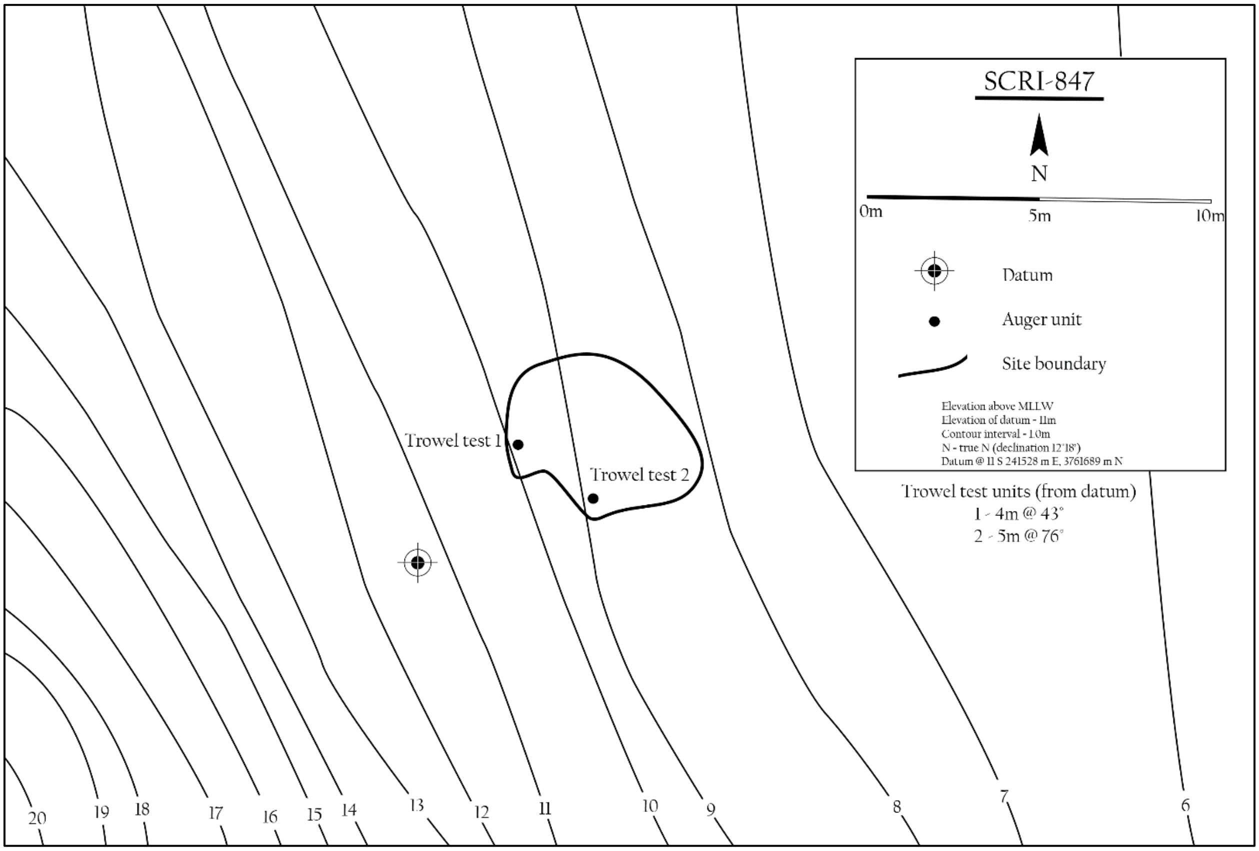

FIGURE 9: MAP OF SCRI-847

SCRI-847 is a midden-covered slope on the western side of the mouth of the canyon. Located across the drainage from SCRI-845, the site is associated with the talus slope of a small and heavily-eroded rock shelter (see Figure 9). The rock shelter adjacent to the extant cultural material was probably the focus of the occupation, though the collapse of the overhang and erosion from the hill above have obliterated any trace of use in the rock shelter itself. The immediate environment of SCRI-847 is dominated by the coastal-bluff scrub (on the slopes above the rock shelter) and coastal marsh/estuary (in the flats below the site) plant communities respectively. Less than 25m to the south and east lies the bulk of the Laguna marsh, rebounding today after the eradication of introduced ranch stock. Transient use of this site may have been associated with the marsh zone immediately below the remains of the rock shelter, in processing reeds or plant material, or it may have been associated with field processing shellfish from the rocky beach located ~120m away on foot. That section of the beach is currently the best location for both fishing and shellfish collecting in Laguna itself and the only place with access to rocky intertidal habitat for harvesting *Mytilus californianus* and similar species. On a more concrete level, assessing the use of this site as a component of the broader settlement pattern only a Middle period occupation is possible because of similarity between deposits of that age here and elsewhere in Laguna.

I sited no auger units in this deposit due to low midden density and depth. Instead, two 5cm x 5cm trowel tests were collected in order to characterize the site deposit. Both test units went sterile before 10cm depth. Where bedrock did not immediately underlie the deposit, tests in sterile soil yielded no buried cultural material to a depth of 40cm. The small extent of the site and the shallow deposits of low-density cultural material suggest that the site has either been heavily damaged since its recording by Olson or that it was relatively lightly used during its occupation. Despite its sparseness, the material that was collected matches that of other sites in Laguna in terms of composition: overwhelmingly *M. californianus* with low concentrations of other shell, of bone, and of flaked stone. No diagnostic artifacts were recovered at SCRI-847, making definitive determination of age impossible without radiocarbon dating. Despite its proximity to the marsh, the site yielded no evidence of any tools adapted to plant processing.

SCRI-848

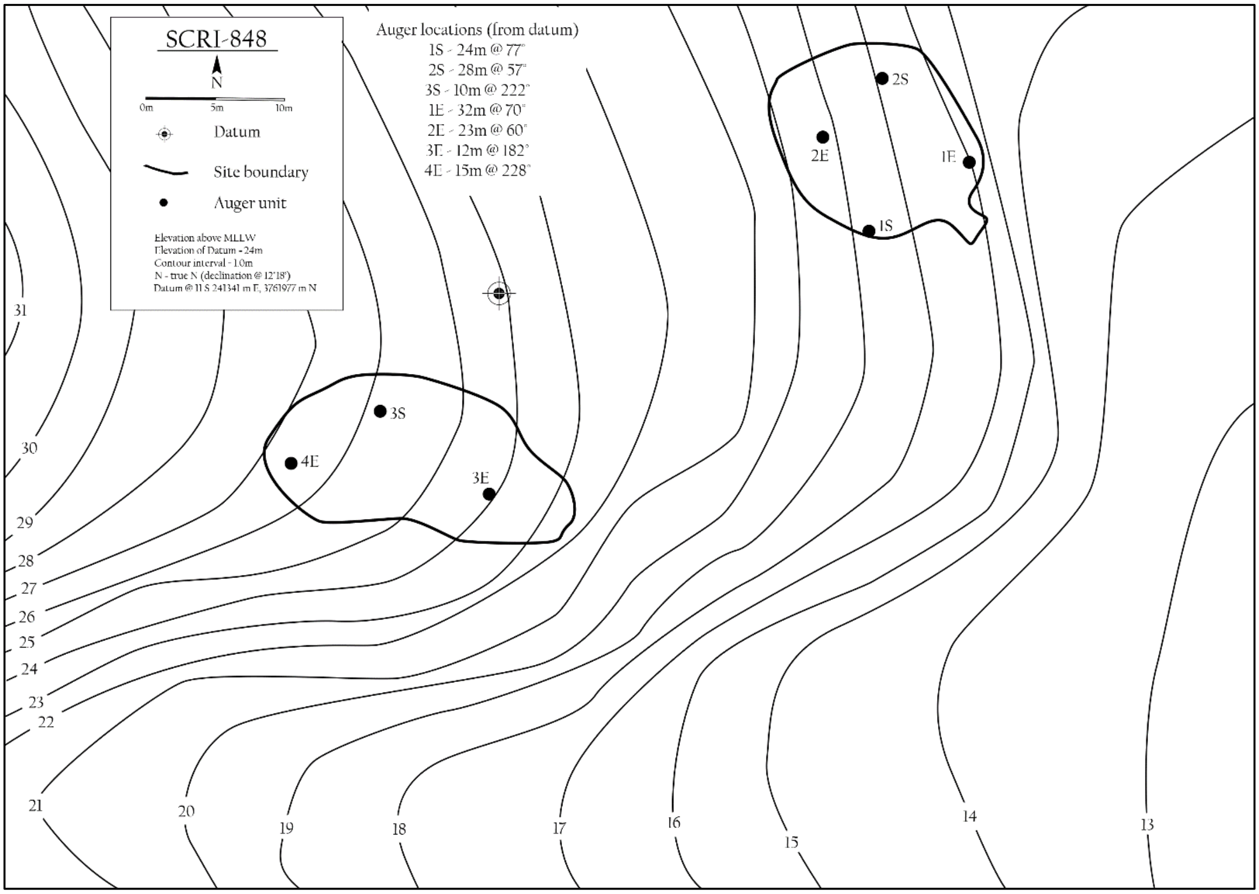

FIGURE 10: MAP OF SCRI-848

This site comprises two shallow loci located on the end of a relatively stable, flat ridge between SCRI-849 and SCRI-387. This site is similar to many reported in Coches Prietos by Peterson (1994) and may represent an accumulation of anthropogenic material on the path connecting the two larger sites to the north and south (see the discussion of such sites in Kennett 2005:169). While the topography is suitable for site preservation, the lack of ground cover has contributed to the destruction of SCRI-848. Locus 1 (noted as L-1 on the site map [see Figure 10]) is perched directly above exposed bedrock, with a significant portion of the locus cut by growing erosion channels. Very sparse coastal-sage scrub, overlooking intermixed coastal-sage scrub and mule-fat scrub in the drainage bottom adjacent, composes the majority of the nearby vegetation. Several *Quercus spp.* are present in this locality (including one near Locus 2 [L-2 in Figure 10]).

Shell content at SCRI-848 is consistent with other low-density sites in Laguna. *Mytilus californianus* composes >95% of the assemblage by weight, the remainder of the shell dominated by *Balanus* with trace amounts of *P. polymerus*, *S. bifurcatus*, *H. cracherodii*, *Strongylocentrotus spp.*, crab, limpets, and chitons. Lithics were consistent with SCRI-849 (see below): a single igneous undiagnostic microblade; two fused shale biface thinning flakes; and the rest igneous debitage and flakes. Faunal material is sparse at the site, limited to bony fish. The two loci at SCRI-848 are thin, relatively sparse, and located precariously atop exposed bedrock. Artifactual material suggests that the occupation dates to the Middle period, with no diagnostic artifacts dating to the Transition or later. This is in sharp contrast with SCRI-849, located only a few hundred meters south over the next ridge, where clear post-Middle period material appears.

SCRI-387

This site, recorded by Timbrook in 1980, was recognized as the result of an accidental discovery. The hunt club operation that was active in the mid-1970s on the island drew hunters, one of whom recovered a wooden artifact (called a paddle) from the cave associated with the midden slope (Timbrook 1980). She did not conduct excavation at the site due to the disconnect between the artifact itself and the associated midden. Timbrook reports feral sheep bones atop the midden, none of which were observed during the 2012 survey. Timbrook drew a connection between this artifact and the availability of *P. ilicifolia* in Laguna, suggesting that it was used to process *islay* (Timbrook 1980). *P. ilicifolia* is present in the modern canyon, though its antiquity in the drainage is not known (no clear macrobotanical remains of this species were recovered, though further analysis would be necessary to determine that definitively). SCRI-387 possesses a large midden apron associated with the talus slope of a cave (also described by Timbrook). Surface survey of the site suggests a midden composition similar to the rest of Laguna, Middle period in age and dominated by *Mytilus*.

SCRI-849

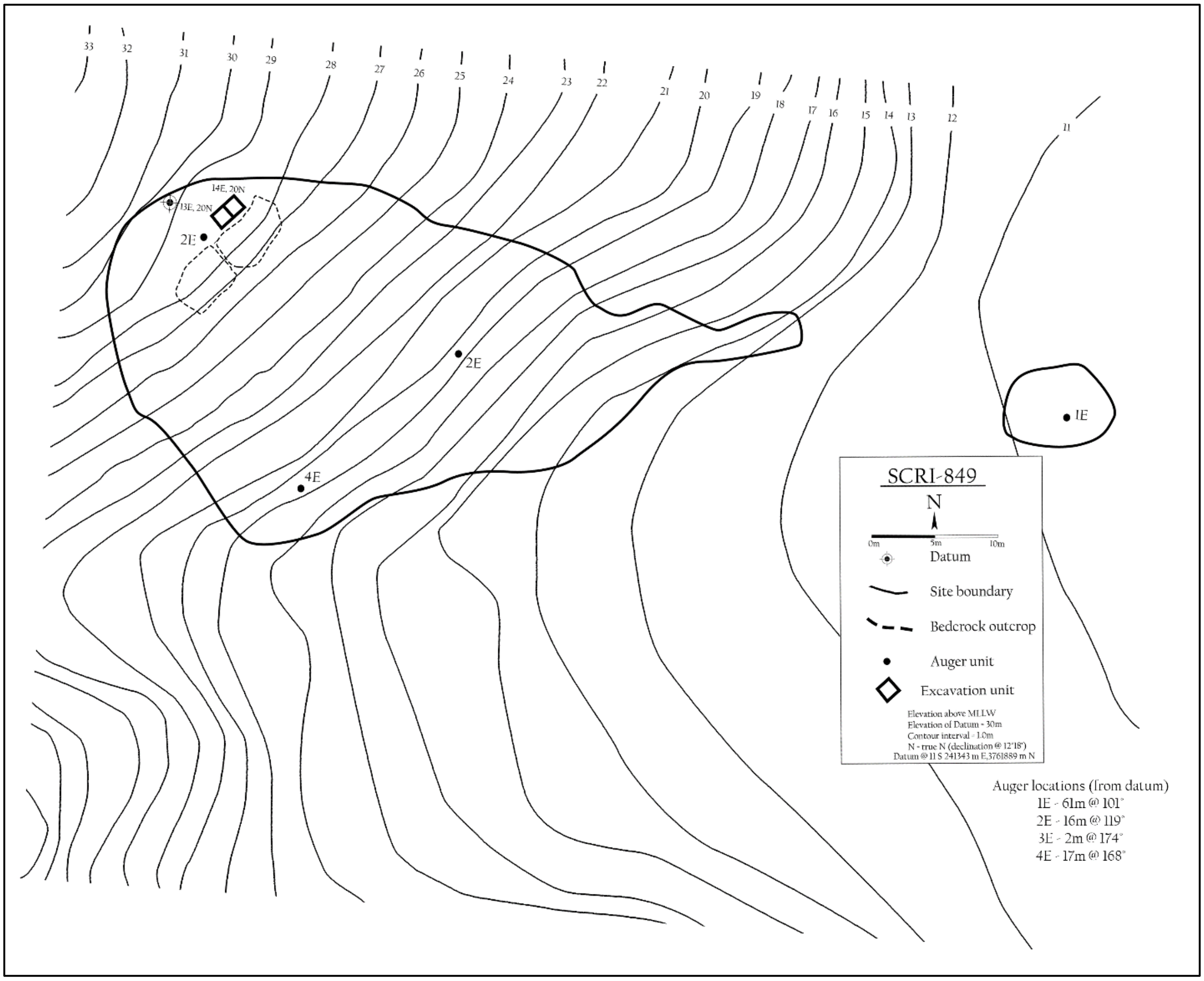

FIGURE 11: MAP OF SCRI-849

Along with SCRI-843, SCRI-849 is both a fascinating and challenging site. Unlike SCRI-843, however, intact deposits at SCRI-849 made excavation worthwhile in addition to the initial four auger units from 2012. This site has a complex history and stratigraphy, and it occupies a unique place in the understanding of Laguna Canyon, the south side of SCRI, and the emergence of craft specialization on the islands. SCRI-849 is the only site in the canyon to possess definitive post-Middle period deposits (Transitional, Late, and Historic). Radiocarbon dating places the upper portion of the intact material at ~1272 A.D. (see Table 1). The site was initially skipped during survey (hence being numbered after SCRI-848, which is located on the next ridge to the north) because of its very atypical features. That mistake was remedied, however, by a second sweep, during which one of the crew sat on a large slope, presumed to be natural, that was in fact covered in midden. The site itself is nearly entirely an eroding, midden-covered slope of surprising depth (maximum of 83cm), extremely poorly consolidated. Local vegetation is typical for this section of the canyon: sparse coastal-sage scrub covers the site itself; widely distributed coastal-bluff scrub community dominates the slope above the site (covering the entirety of the ridge up to the crest separating Malva Real and Laguna); riparian herbaceous vegetation and mule-fat scrub intergrade in the stream channel below the site, thickly blocking access to SCRI-849 itself from the center of Laguna (i.e. from the road).

The topography of the area surrounding SCRI-849 is an important factor in the distribution of these vegetation communities, but beyond conditioning the distribution of flora in the present it also has had a dramatic impact on the taphonomy of the site, for better and for worse. The site map illustrates the steepness of the slope and the precarious position the majority of the midden occupies (see Figure 11). Overgrazing, and the resultant exposure of bedrock directly upslope from SCRI-849, has likely contributed significantly to the erosion at the site by changing the pattern and intensity of runoff. This is demonstrated at the very least by both the size-sorted “tail” of midden carried downslope by flowing water and the sterile layers of soil that cap the stable component of the site. When flowing, the stream undercuts the base of the midden slope, and over time it will destroy the surface component of the site altogether. If this process had been more rapid, or if taphonomy had eliminated midden in situ, or if the slope itself been the extent of SCRI-849, the site would have been interesting but limited in its potential to contribute to an analysis of the canyon's occupation due to the heavy disturbance and lack of identifiable stratigraphy by which to control the excavation and analysis. Fortunately, however, that was not the case.

The dominant feature of SCRI-849, and the one that preserved the site for study, is a large bedrock slab perched atop the midden slope. That slab, measuring 10m in length and 3m in height, was connected to the hill above the site, forming a large rock shelter. When it was occupied, SCRI-849 comprised two site loci: a rock shelter occupation below the shelf, and a second occupation sitting atop the slab. When that slab collapsed, the upper site was dumped into the stream channel below, forming the midden-covered slope present today (see Figure 12). This event simultaneously capped and sealed the rock shelter deposit. Auger unit 3E, located on the flat area above the bedrock slab, went to 160cm depth and could not continue due to snaking and the looseness of the midden rather than encountering bedrock or sterile soil. Excavation unit 13E, 20N ultimately reached 190cm of cultural material near that auger. The profile for that unit supports the history of the site: a collapse level associated with the fall of the bedrock slab, with heavily disturbed material above and in situ deposits below (see Figures 12 and 13). A small amount of midden still preserved on the slope above the site datum further confirms its original structure (see Figure 11). Much of the latter material was not exposed during excavation in unit 14E, 20N, which stopped at 100cm depth, but 13E, 20N produced a large quantity of midden in situ below that level. The upper component (here defined as the material above ~85cm in both units, with "lower component" referring to Middle and Transitional period midden in situ below 90cm; see Figures 12 and 13) contains primarily post-Middle period material, significantly out of context. The timing of the collapse is somewhat difficult to ascertain, however.

The upper component of the site includes Late and Historic material, suggesting that the occupation of the canyon ended before the shelf fell. The only clear in situ deposits above the rock layer are the top two levels, which are dominantly sterile except for a single *H. cracherodii* feature that also included ovicaprid elements. By the time of the 19th or early 20th century ranch operations, then, the site had collapsed and a vaquero had lunch atop the present site surface. The sea breeze atop the site occasionally brings cool air to SCRI-849, which can otherwise be sweltering, and it affords an excellent view of the castration corral across the canyon. Whatever its post-collapse life may have been, the fall of the rock slab itself occurred during or after the Transitional period, and was likely much later in the Historic period, preserving all Middle, and significant Transitional, components of the midden in situ.

As a result of the complicated taphonomy, the contents of the site deposits are themselves complex. Levels above 85cm in both excavation units (14E, 20N and 13E, 20N) contain few local igneous flaked stone artifacts relative to lower component. The upper component of both units is characterized by finished tools associated with the formal microdrill industry, but very little Olivella debitage and few BIPs suggesting actual bead-making occurred at the site for any sustained period in any significant quantity (see Tables 3, 4, 7). For sorted levels, Olivella detritus quantities and weights are consistent throughout the occupation at SCRI-849, before, during, and after the Transitional period (see Tables 4 & 5). Whatever transformations occurred elsewhere on SCRI, the rise of bead-making did not change the intensity of that activity in Laguna. Despite the small quantities, the presence of some detritus does suggest low-level Olivella bead drilling throughout the occupation at SCRI-849, including the drilling of callus beads (see Table 6). Olivella beads were not the only product made in small quantities in this manner at SCRI-849, however; *Haliotis* ornaments (n=1) and ornaments-in-production (n=2) were recovered from the Middle period site component. Along with these hints of shellworking at the site, the lower component of 13E, 20N contains a sizeable number of microlithic tools produced from local Laguna igneous not present above the collapse level. Microdrills situated immediately below the collapse level correspond with the radiocarbon results to support a later Transitional period occupation in this phase of the site. Below that depth, the majority of the local igneous microdrills fall into the triangular undiagnostic category common to the wider Middle period microlithic industry on the island (see discussion of microdrills below). Unlike SCRI-845, I recovered very little chert from this site. Only chert microblade cores are present at SCRI-849 (see discussion of microblade cores below for distinctions between microblade and non-microblade cores). The use of shell and stone attested at SCRI-849 falls comfortably within the broader pattern of non-specialized craft production characteristic of the Middle period and imply non-intensive manufacture of beads and ornaments primarily for personal or local use.

Subsistence patterns at SCRI-849 were typical for Laguna. Trends in both shellfish and faunal remains are similar to those discussed above for SCRI-843 and SCRI-845. Between 95% and 99% of the shell is *M. californianus*, with the same range of species reported elsewhere in Laguna composing the remaining 1%-5%. *Balanus spp.* are again the second most common taxon by weight. For example, at 115-120cm depth in unit 13E, 20N *Balanus* alone rises to 867.45g (see Table 29). Whole *H. cracherodii* is present primarily above the collapse in small quantities, though individual shells are large in size in some cases (see Table 29). As with SCRI-845, the most common faunal remains are teleost, though the there is a relatively greater abundance of juvenile *Otariidae* at SCRI-849 than SCRI-845. Shoulder and neck elements (including scapulae, proximal humeri, cranial plates, and cervical vertebrae) with unfused epiphyses dominate this assemblage, with no identified elements from other portions of the body present at SCRI-849.

The pattern of late Middle period settlement seen in Coches Prietos (relatively small interior sites associated with rock shelters with small [but nonzero] amounts of bead detritus) holds true for SCRI-849 in Laguna (Peterson 1994). The important difference, however, is the clear continuity of occupation supported by the radiocarbon dates and the microdrill assemblage at SCRI-849 not seen in the Coches sites. That fact that SCRI-849 includes the Transitional period, bridging the gap between the non-specialized late Middle period economy and the fully developed Late period bead industry, provides a critical data point to begin understanding the broader settlement pattern of the south side of SCRI during this period, outside of major coastal villages. This site suggests that the pattern of contraction seen in Laguna was not an abandonment of the canyon in its entirety during the Transitional period, and that drainages without large coastal villages like Coches Prietos were still occupied to some degree despite large-scale contraction of the settlement pattern on the island.

SCRI-850

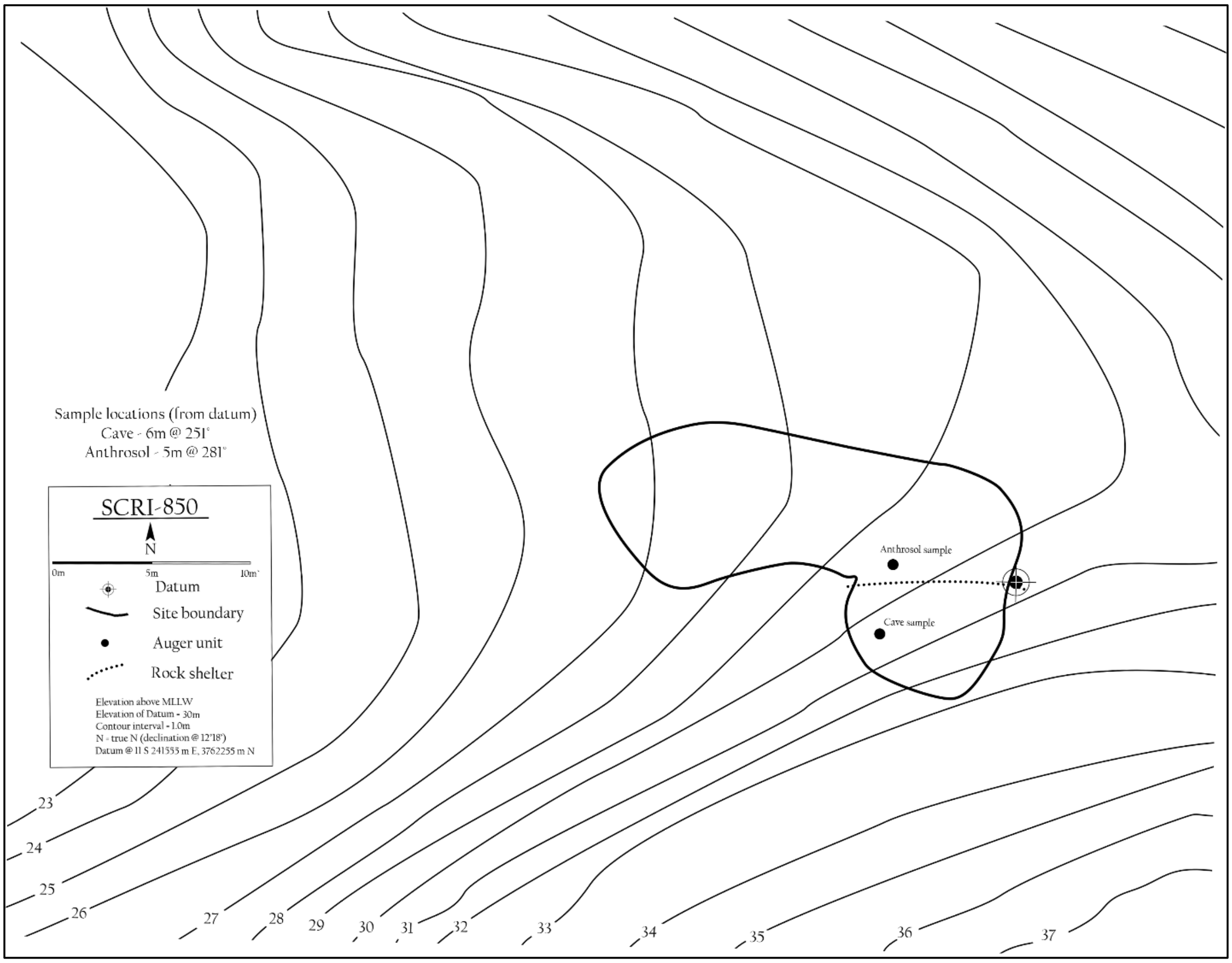

FIGURE 14: MAP OF SCRI-850

SCRI-850 is clearly a deposit out of place. Very little midden soil is directly associated with the site, the majority of which is composed of nearly whole *H. cracherodii* and well-preserved *M. californianu*s. A number of large fire-affected rocks are also present at SCRI-850. Two trowel test samples from the site characterize the extant material and assess the very thin possible anthrosol (see Figure 14). Due to its current location in a cave along a scoured creek bed, SCRI-850 was likely originally positioned at a higher elevation in its original context. No candidate rock shelters are present in the immediate environment, however, aside from the one in which the current deposit is located. The excellent preservation of shell in both samples is striking, considering the likelihood that they were washed into their current position during flooding, and suggests size sorting of the material as it was pushed further into the center of Laguna and subsequently buried by alluvium. Assessing the position of SCRI-850 in the larger settlement pattern is not possible beyond this level of speculation, though like SCRI-846 (and many Laguna sites) it highlights the ongoing destruction of cultural deposits in the canyon. Thick mule-fat scrub chokes the flat channel in which the site lies, and above the rock shelter the slopes are characteristically coastal-bluff scrub with very little groundcover. Another strong storm may likely destroy this site, as it is in essence a scatter of shell and lithics with no meaningful consolidation or support. It is possible that in the intervening five years since my survey that erosion has already done so.

SCRI-851

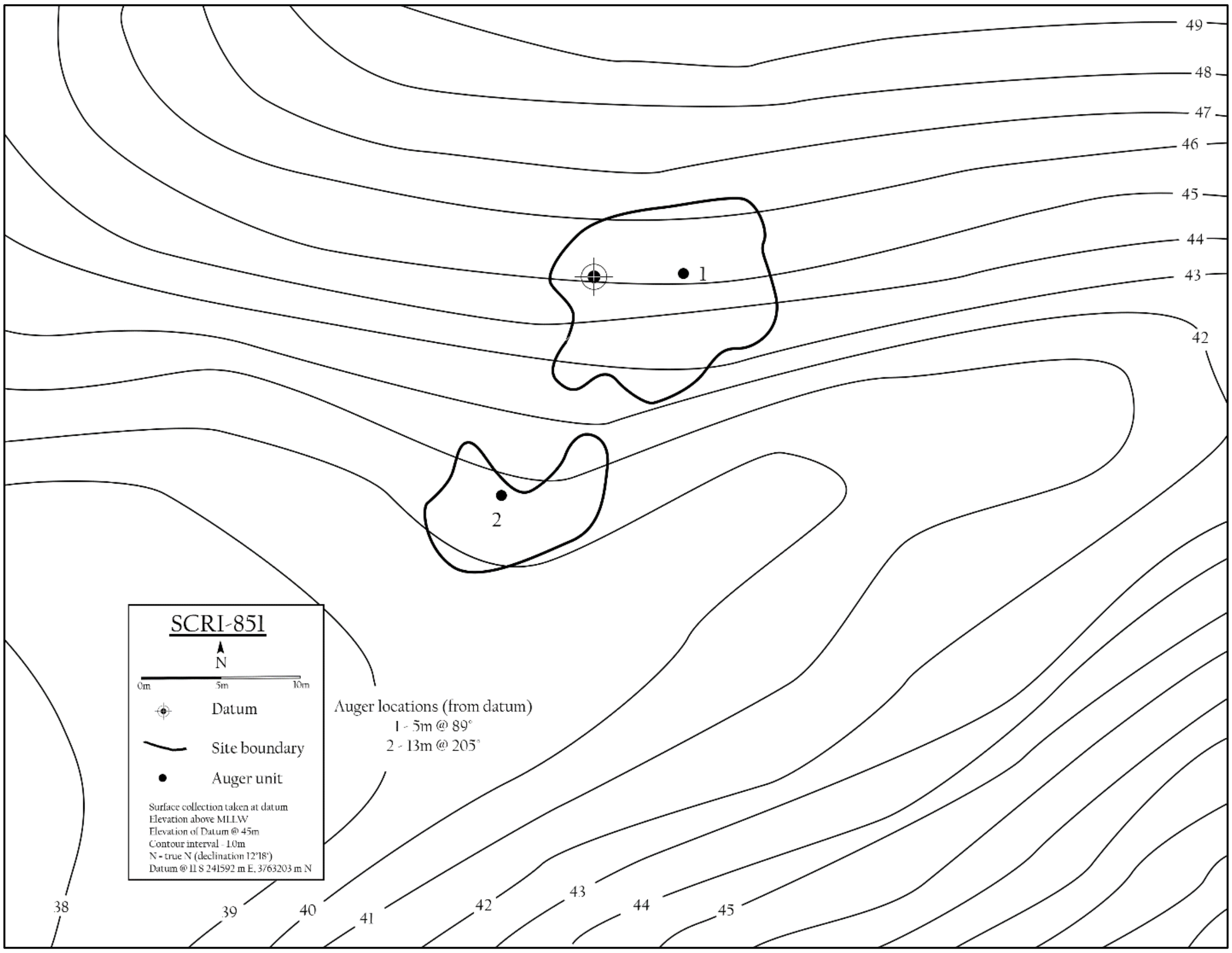

FIGURE 15: MAP OF SCRI-851

SCRI-851 is a heavily eroded site, up-drainage ~1.5km from the coast. The site is primarily situated in the bottom of a broad stream bed, and the gap between the northern and southern site components is exposed bedrock (see Figure 15). The southern component is large, deep, and relatively stable compared to the northern one, but is the product of taphonomy rather than human activity. The original location of the entire site was the flat and open space above and around the northern site component, though that location is now sterile. The midden itself is nondescript: overwhelmingly *Mytilus* (98-99% in all levels, see Table 26) tempered only by trace amounts of *Strongylocentrotus spp.* and a single limpet (see Table 35). Olivella detritus, and 12.27g of flaked stone debitage were the primary artifacts at the site. The only other artifacts present at SCRI-851 were an SCRI chert projectile point (see Table 16) and an undiagnostic SCRI chert microblade. As with SCRI-850, no current rock shelter was associated with the site. The southern component of the site is held in place by coastal-sage scrub and mule-fat scrub, and the northern component by coastal-bluff scrub.

SCRI-852

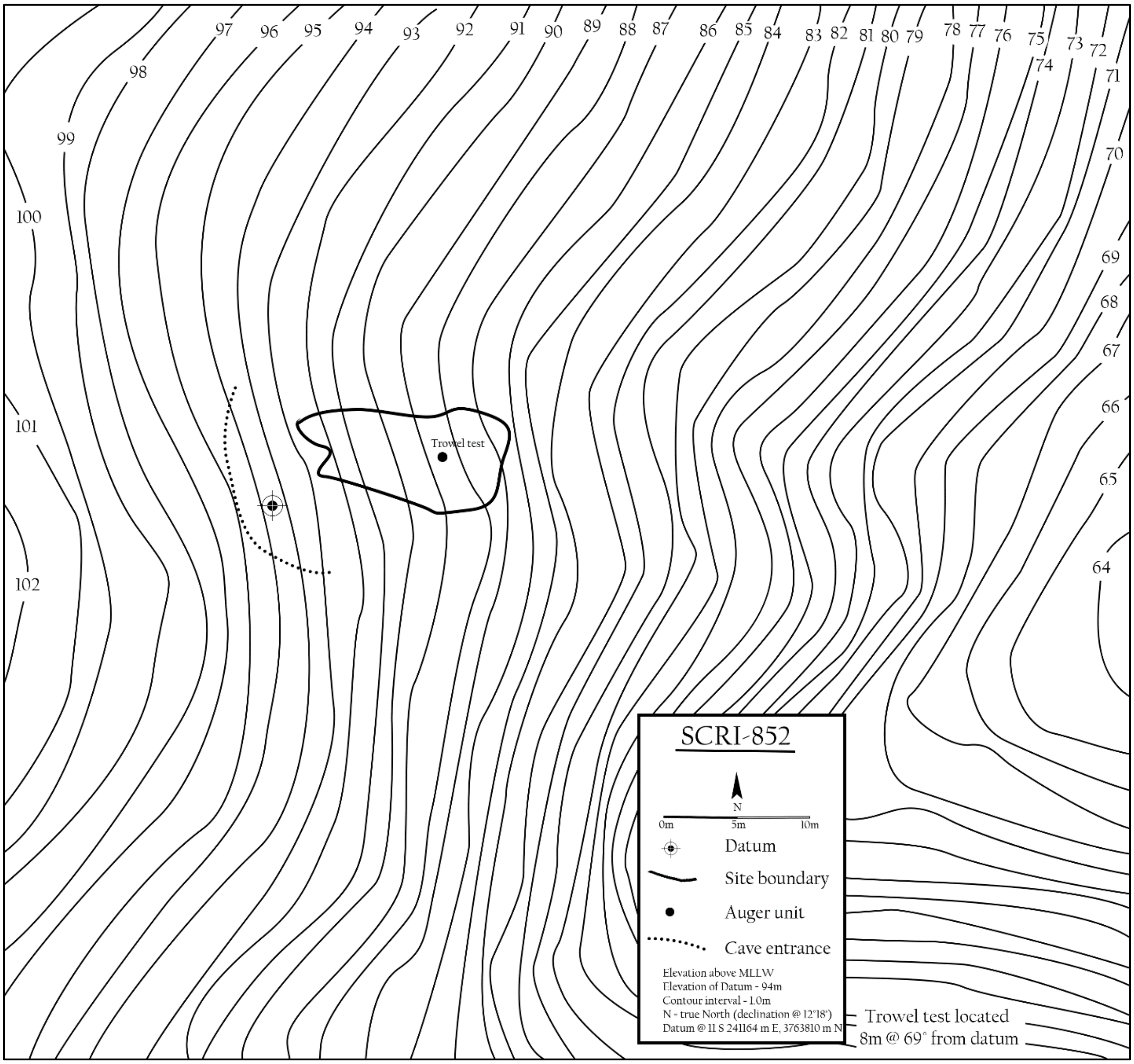

FIGURE 2

SCRI-852 is the last site I recorded during the 2012 survey despite its proximity to SCRI-843 and SCRI-844. All three sites are the furthest inland in Laguna, and the clustering of the three suggests links between their use and occupation, though no direct evidence connects them beyond their location and the general patterns of their contents. SCRI-852 is primarily a midden-covered slope, as SCRI-844, SCRI-847, SCRI-850 were, though in this case the slope is eroding from the mouth of a small cave (see Figure 16). Unlike many of the heavily damaged rock shelters in the canyon, the cave at SCRI-852 is well formed, with two chambers separated by a low space that one must crawl through to access the back chamber. Smoke marks cover much of the ceiling, though of unknown age. Unfortunately, the cave itself is entirely sterile, with a rocky floor and no evidence of midden. The slope below the cave entrance is not the location of a large quantity of midden that may once have been contained in the cave. Like many of the other rock shelters throughout Laguna, ranch stock likely disturbed this site. Their use of the cave for shelter displaced the midden onto the slope below, where it has subsequently begun to erode into the canyon bottom. A shallow, 5cm x 5cm trowel test was collected at this site, yielding an assemblage with no artifacts beyond the midden itself. The midden collected in this sample was very similar in composition to the Laguna assemblage broadly (and to SCRI-851 especially, with essentially no non-*Mytilus* shell). The steep slope at SCRI-852 (23° at the site itself) is an additional complicating factor, and it is likely that little of the site has survived due to the instability of its location on the hillside.

APPENDIX C - FIGURES

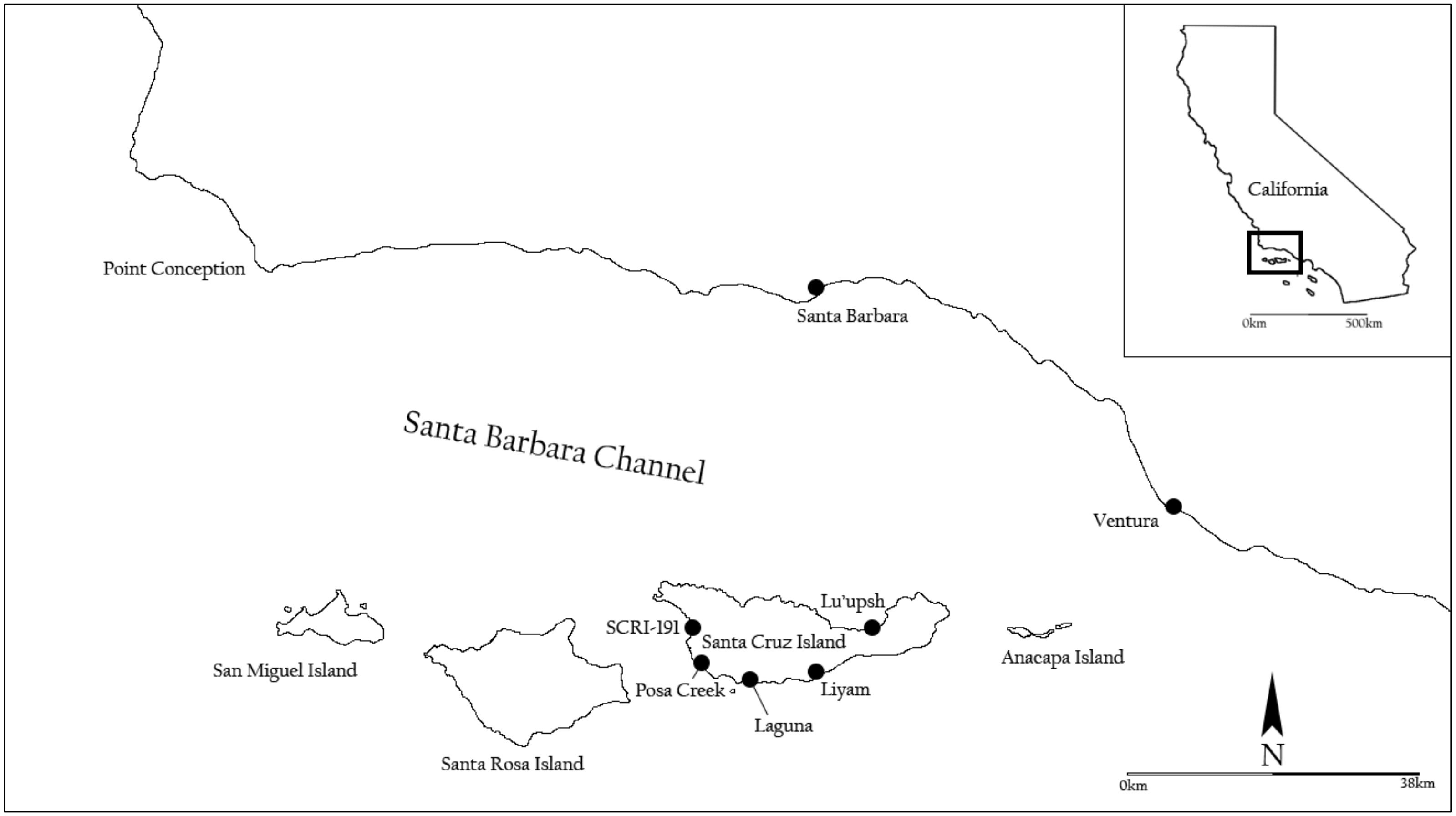

FIGURE 1A: MAP OF THE NORTHERN CHANNEL ISLANDS AND THE SANTA BARBARA MAINLAND (MAJOR SITES MENTIONED IN THE TEXT LABELED; IMAGE CREATED BY S. D. SUNELL, BASE LAYER FROM GOOGLE EARTH)

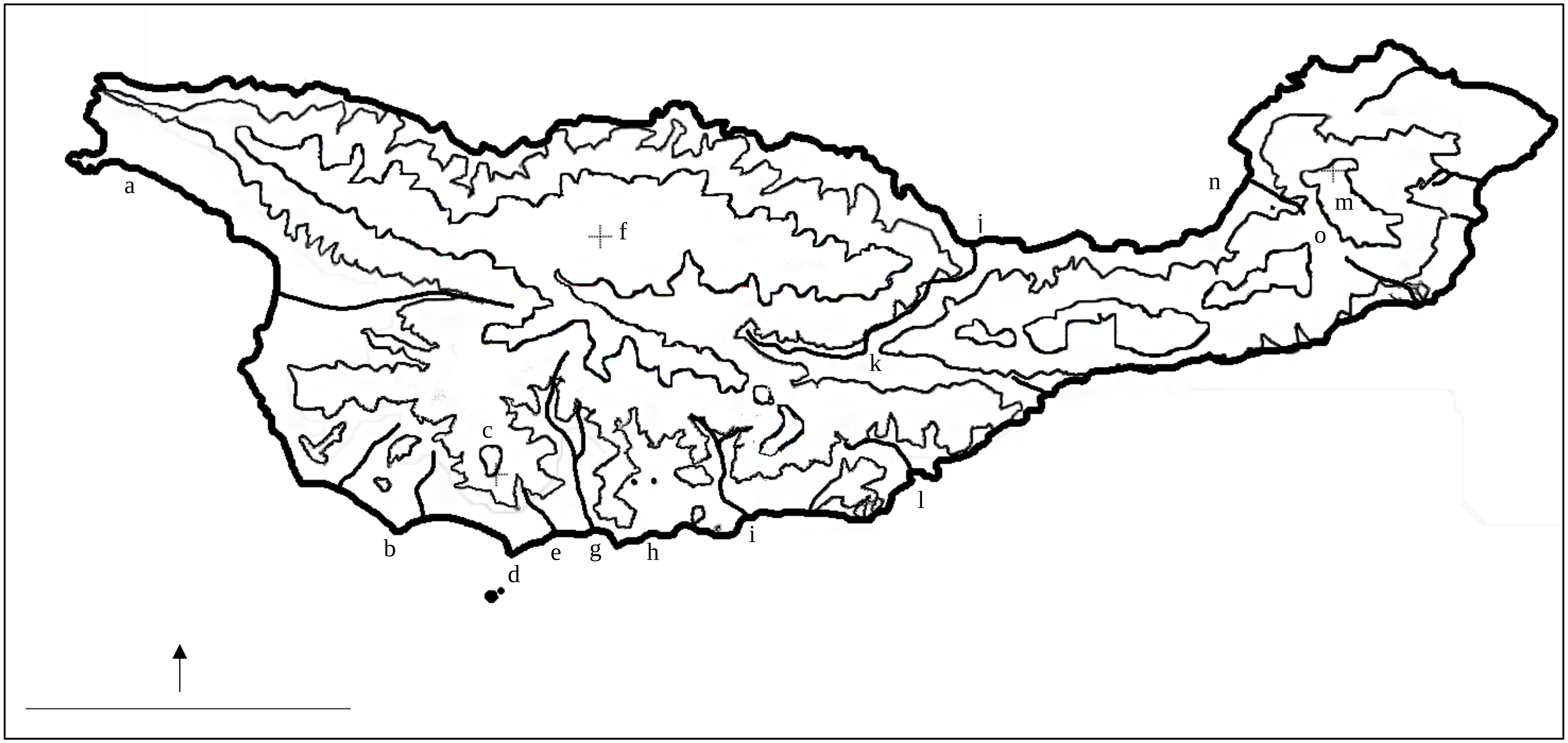

FIGURE 1B: MAP OF SANTA CRUZ ISLAND WITH MAJOR SITES DISCUSSED IN THE TEXT LABELED (CONTOUR LINES @ 200M; SCALE = 8.25KM)

(b) L'akayamu (SCRI-330); (b) Shawa (SCRI-192); (c) Sierra Blanca; (d) Punta Arena; (e) Malva Real; (f) Diablo Peak; (g) Laguna canyon; (h) Alamos Anchorage; (i) Willows; (j) Xaxas (SCRI-240); (k) Cañada del Puerto; (l) Liyam (SCRI-1); (m) El Montañon; (n) Lu'upsh (SCRI-306); (o) Contact zone quarry sites (e.g. SCRI-93)

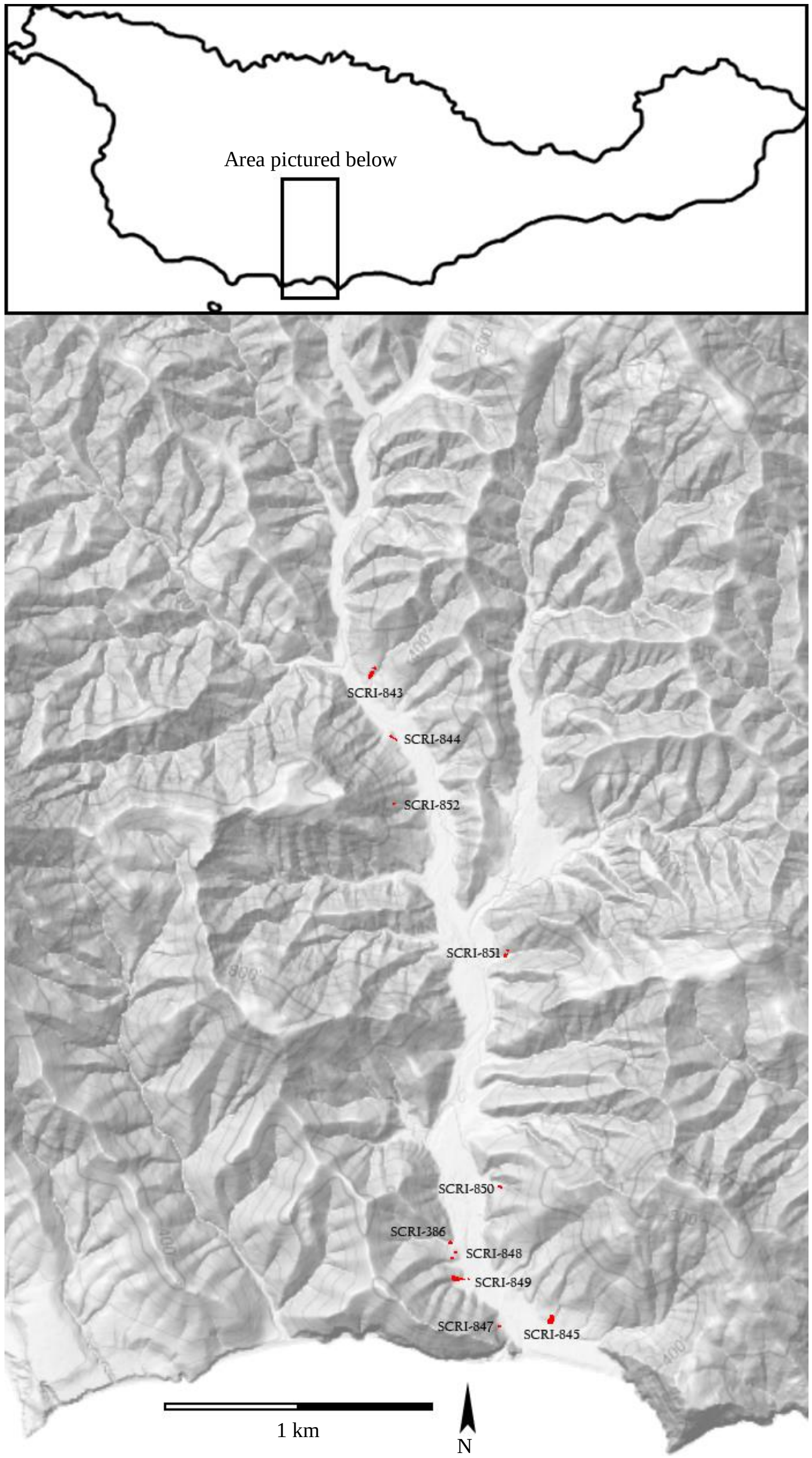

FIGURE 2A: MAP OF SITES IN LAGUNA CANYON (MIDDLE PERIOD)
(IMAGE CREATED BY S. D. SUNELL, BASE LAYER FROM GOOGLE EARTH)

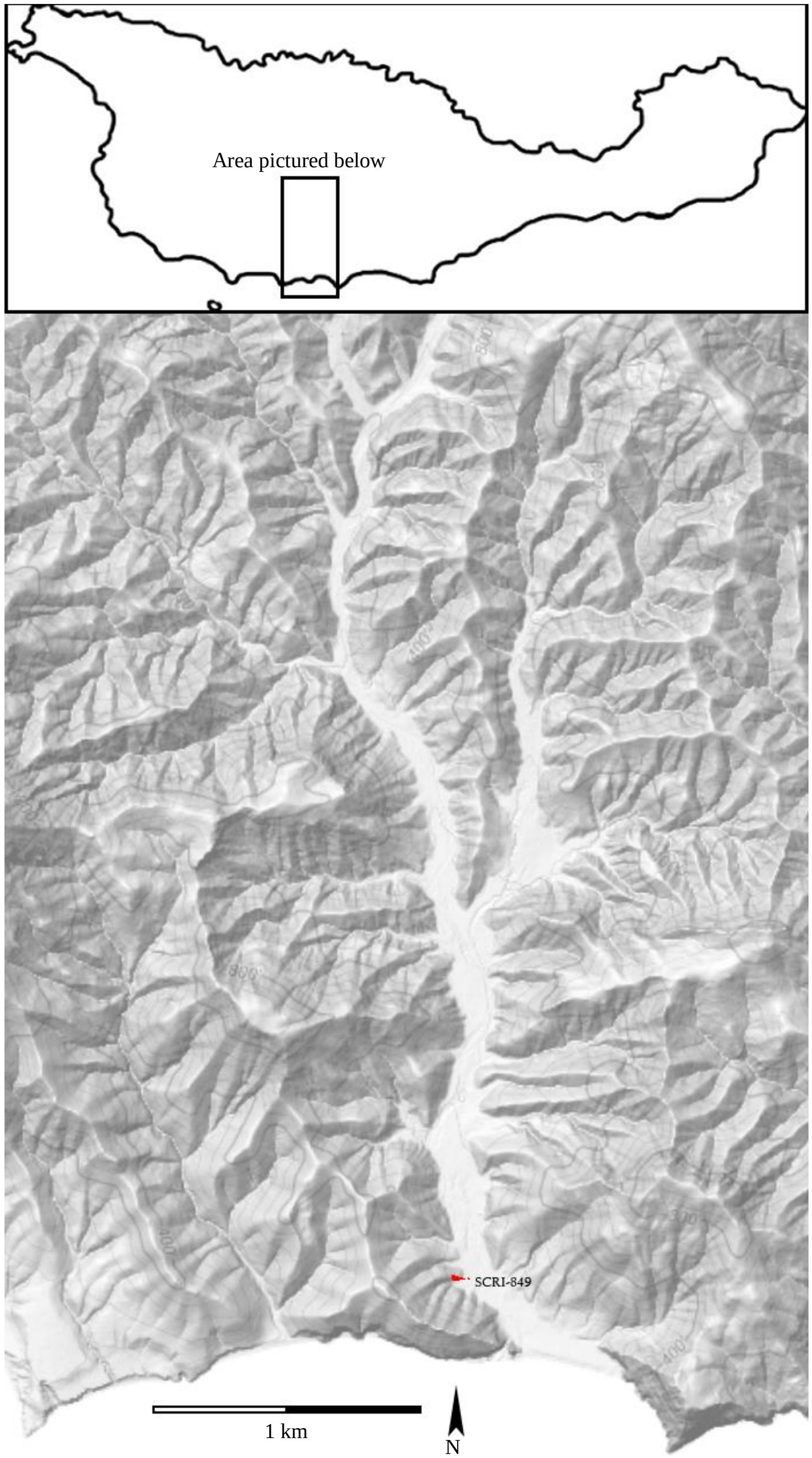

FIGURE 2B: MAP OF SITES IN LAGUNA CANYON (TRANSITIONAL PERIOD)
(IMAGE CREATED BY S. D. SUNELL, BASE LAYER FROM GOOGLE EARTH)

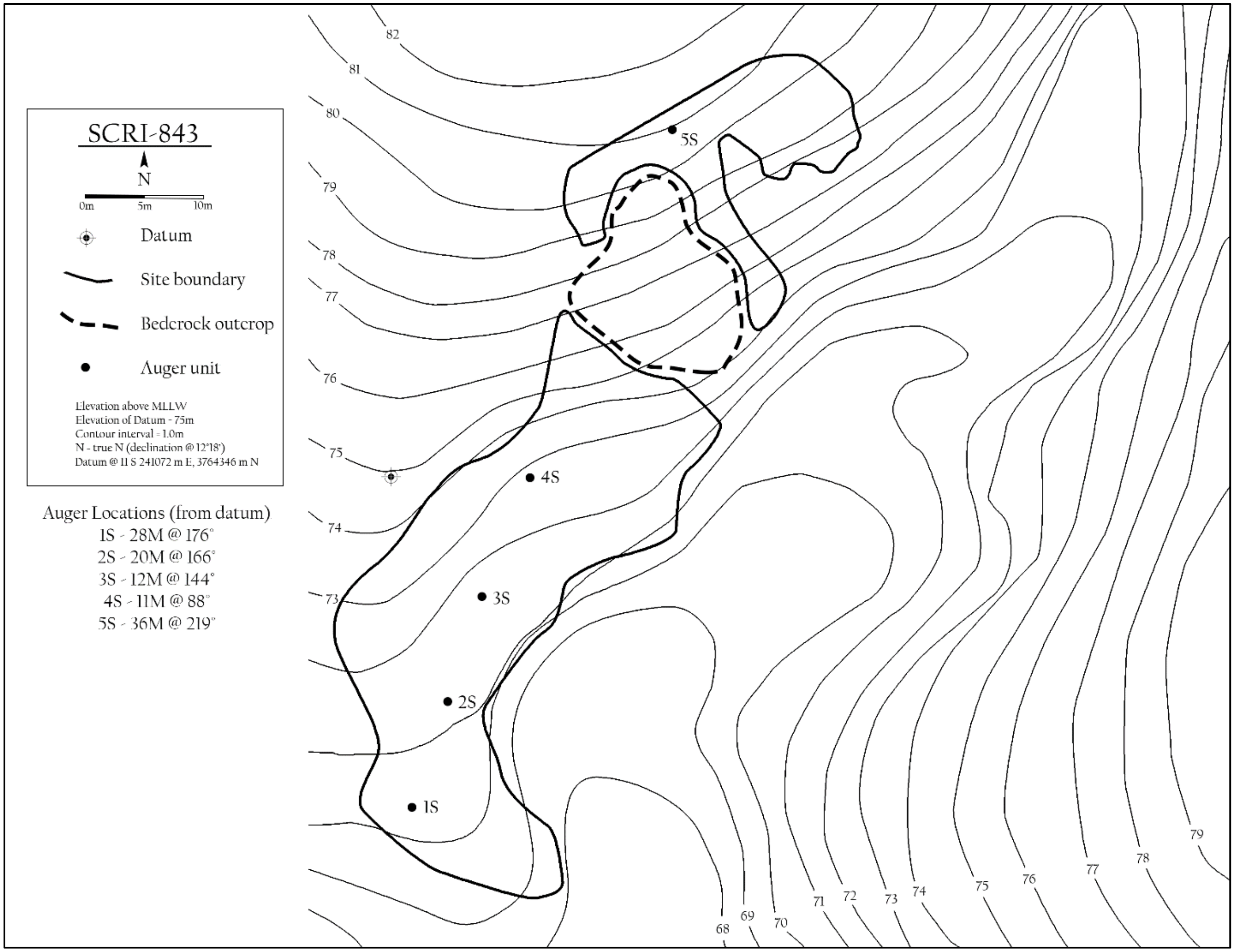

FIGURE 3: MAP OF SCRI-843

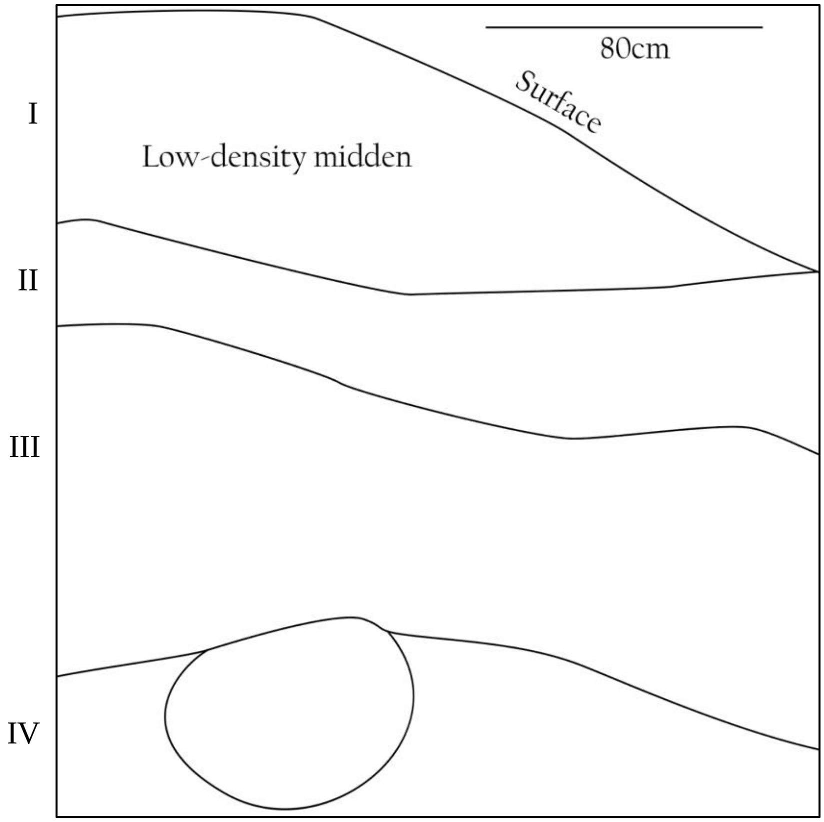

FIGURE 4: PROFILE OF CUT BANK EXPOSURE AT SCRI-843

I – Loosely consolidated, moderate density size-sorted shell, 25% shell, 50% non-cultural rounded to angular pebbles/cobbles, gray-brown silty sand
II – Moderately consolidated, very low density shell, 1% shell 75% non-cultural rounded to sub-angular pebbles, brown silty sand
III – Compact, natural deposit, 30% non-cultural rounded pebbles/cobbles/boulders, brown silty sand
IV – Compact, natural deposit, 30% non-cultural rounded pebbles/cobbles/boulders, light brown silty sand

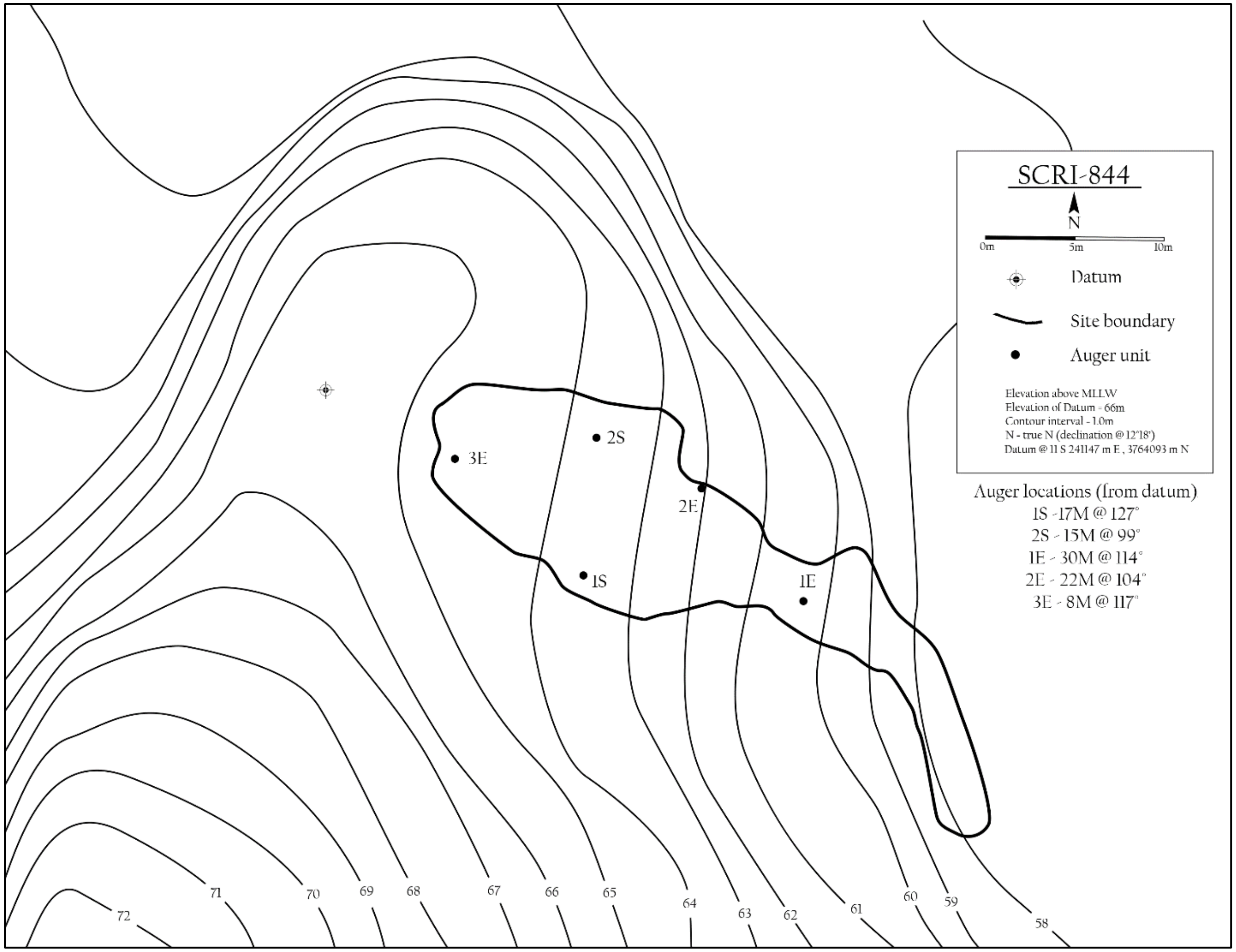

FIGURE 5: MAP OF SCRI-844

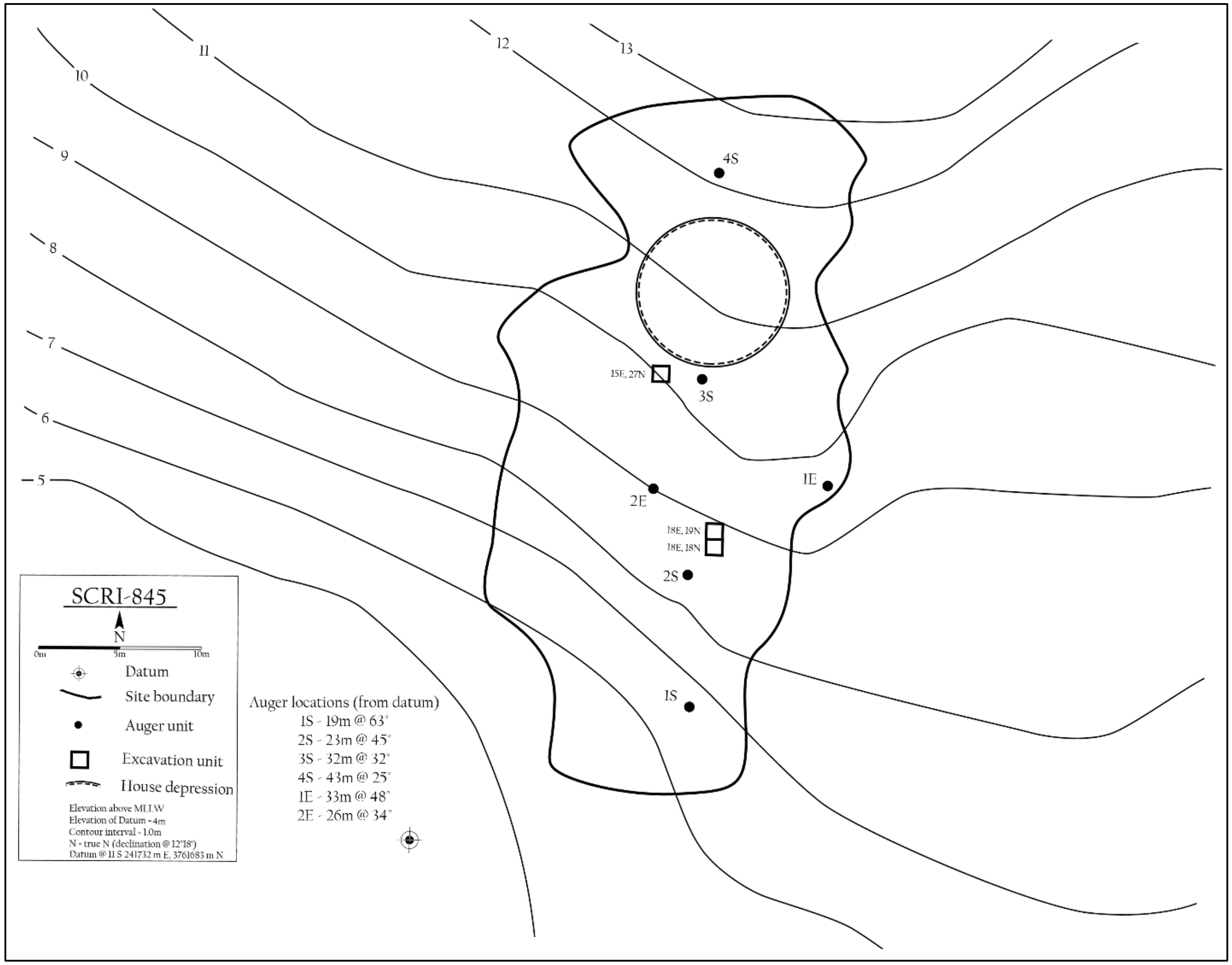

FIGURE 6: MAP OF SCRI-845

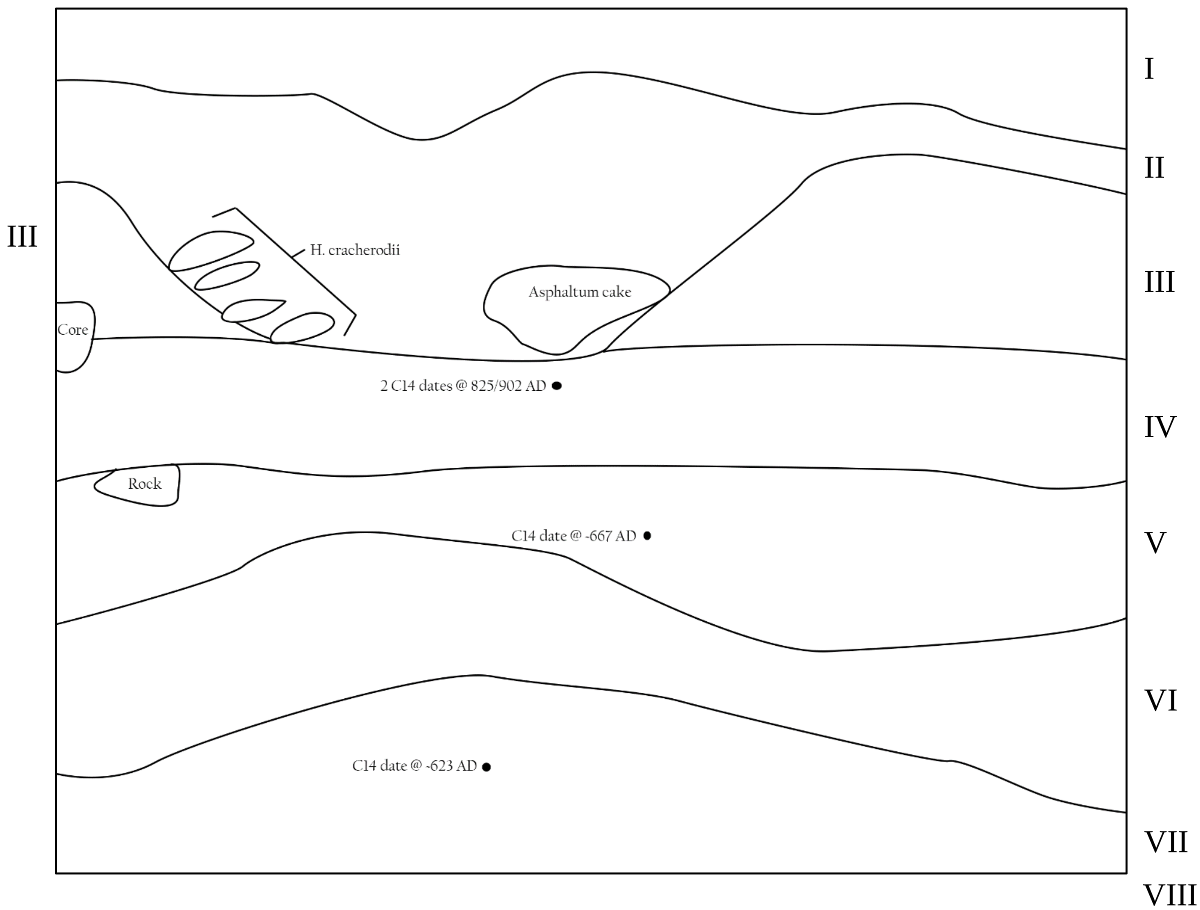

FIGURE 7: PROFILE OF NORTH WALL OF UNIT 15E, 27N AT SCRI-845

I – Loosely consolidated, low density midden, 10% shell, brown silt, topsoil with roots
II – Moderately consolidated, low density midden, 10% shell, gray-brown silt, pit with whole *H. cracherodii* and asphaltum cake
III – Moderately consolidated, moderate density midden, 50% shell, dark gray silt, cut by stratum II
IV – Moderately consolidated, dense midden, 75% shell, dark gray silt
V – Moderately consolidated, very dense midden, 90% shell, dark gray silt
VI – Moderately consolidated, dense midden, 75% shell, dark gray silt
VII – Moderately consolidated, moderate density midden, 50% shell, gray-brown silt
VIII – Compact, sterile natural soil layer, 30% sub-angular to angular non-cultural rock, yellow silty clay

*Starts at bottom edge of Figure 7

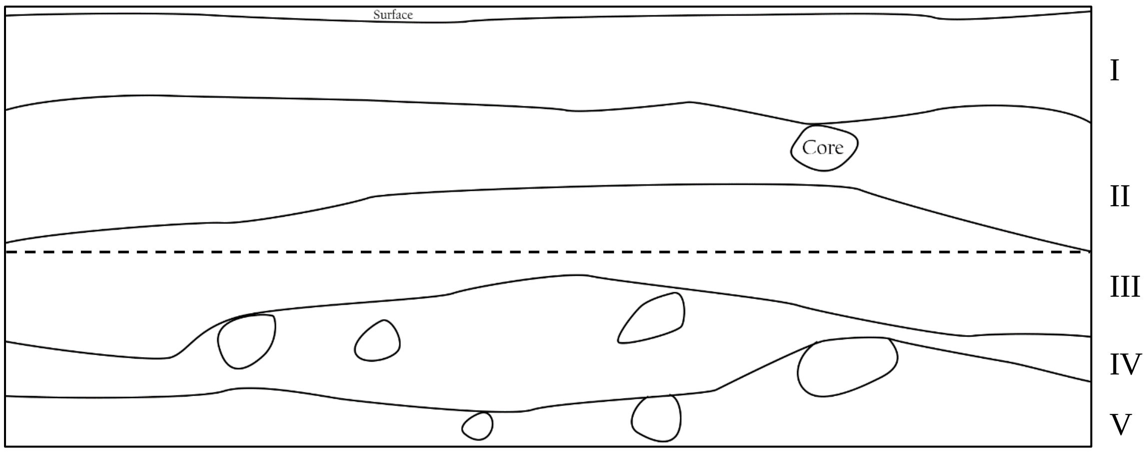

FIGURE 8: PROFILE OF NORTH WALL OF UNITS 18E, 18/19N AT SCRI-845

I – Loosely consolidated, moderate density midden, 50% shell, brown silt, topsoil with roots
II – Moderately consolidated, moderate density midden, 50% shell, gray-brown silt, cultural stone
III – Moderately consolidated, dense midden, 75% shell, dark gray silt
IV – Moderately consolidated, moderate density midden, 50% shell, 20% non-cultural rock, sub-angular to rounded cobbles/boulders, gray-brown silty loam
V – Compact, primarily sterile, 1% shell, 50% non-cultural rock, sub-angular to rounded cobbles/boulders, yellow clayey silt

The dotted line on the profile above represents the maximum depth of the northern half of the stepped unit (18E, 19N)

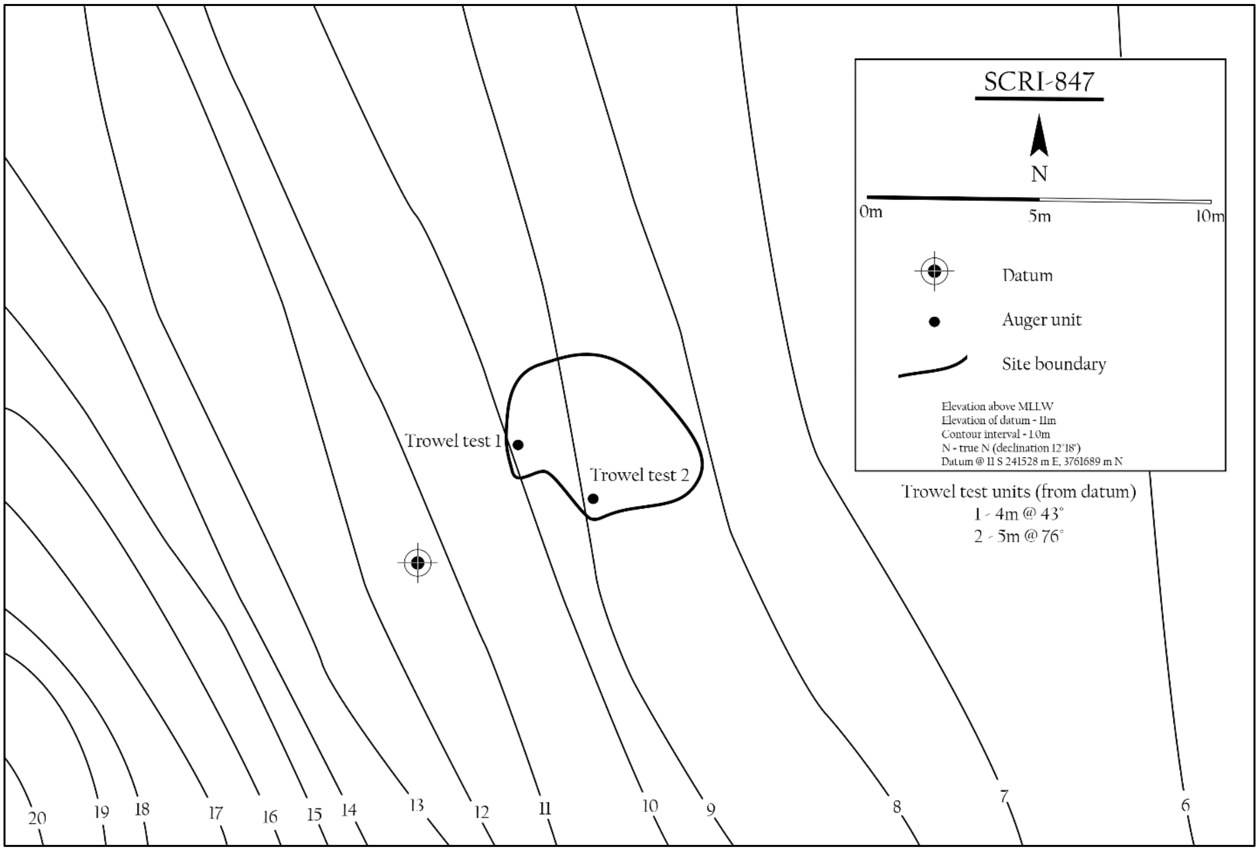

FIGURE 9: MAP OF SCRI-847

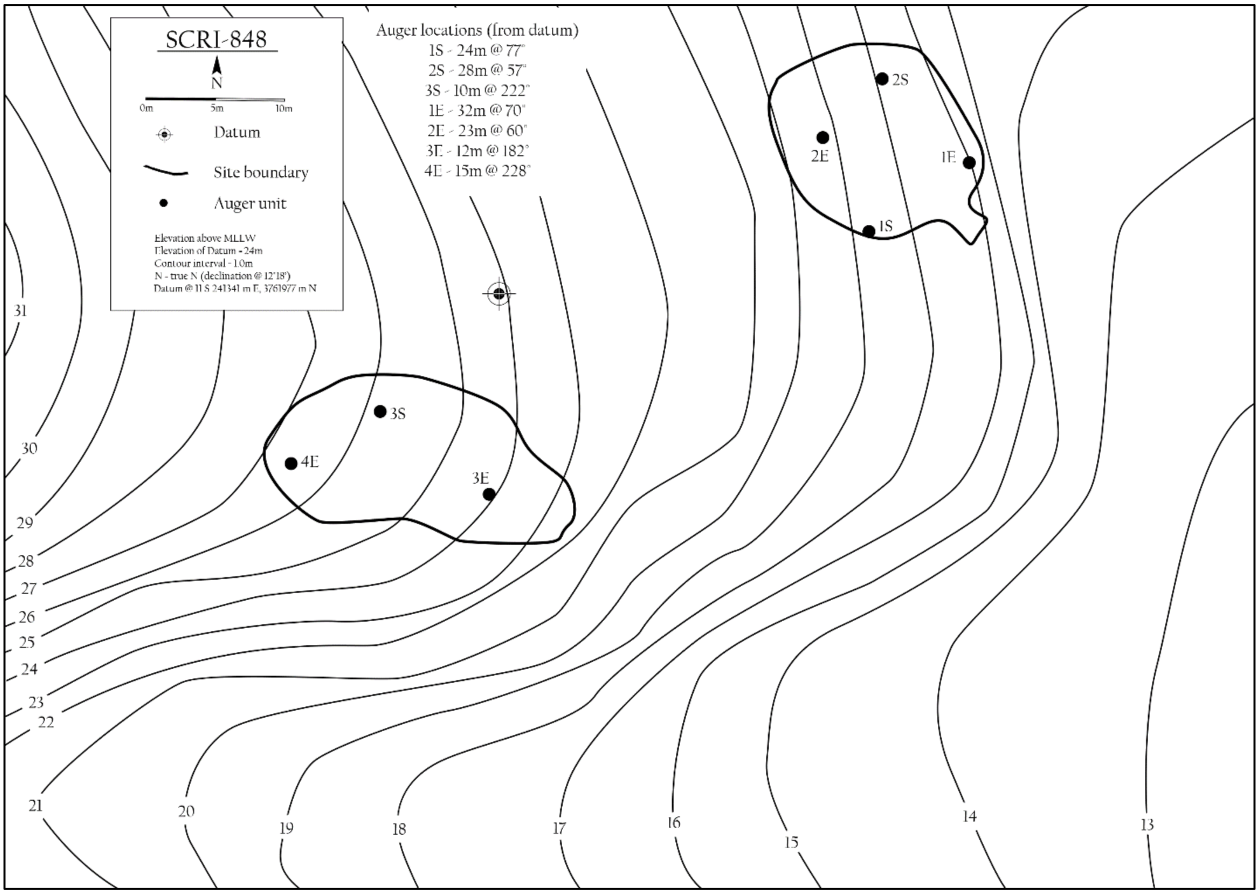

FIGURE 10: MAP OF SCRI-848

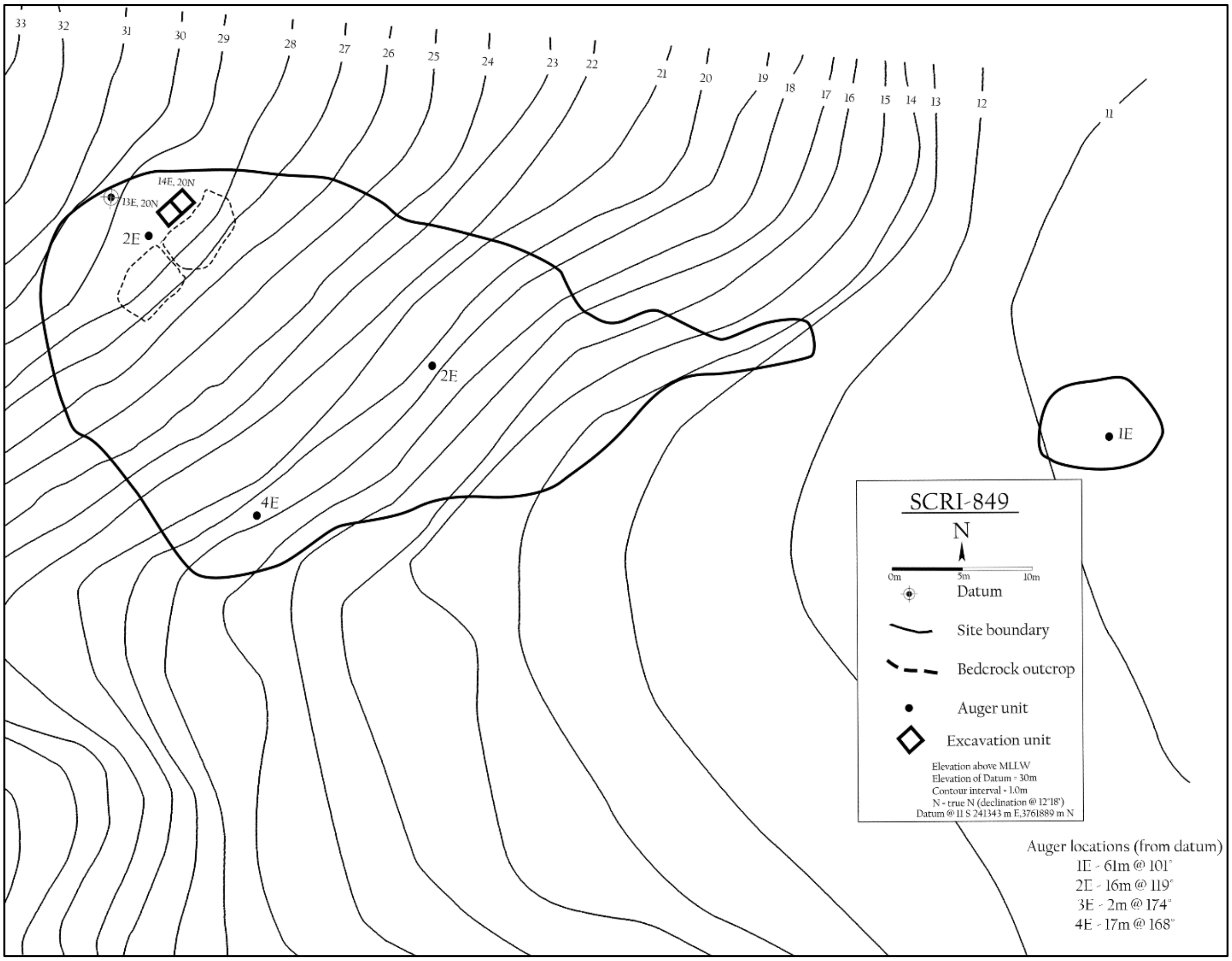

FIGURE 11: MAP OF SCRI-849

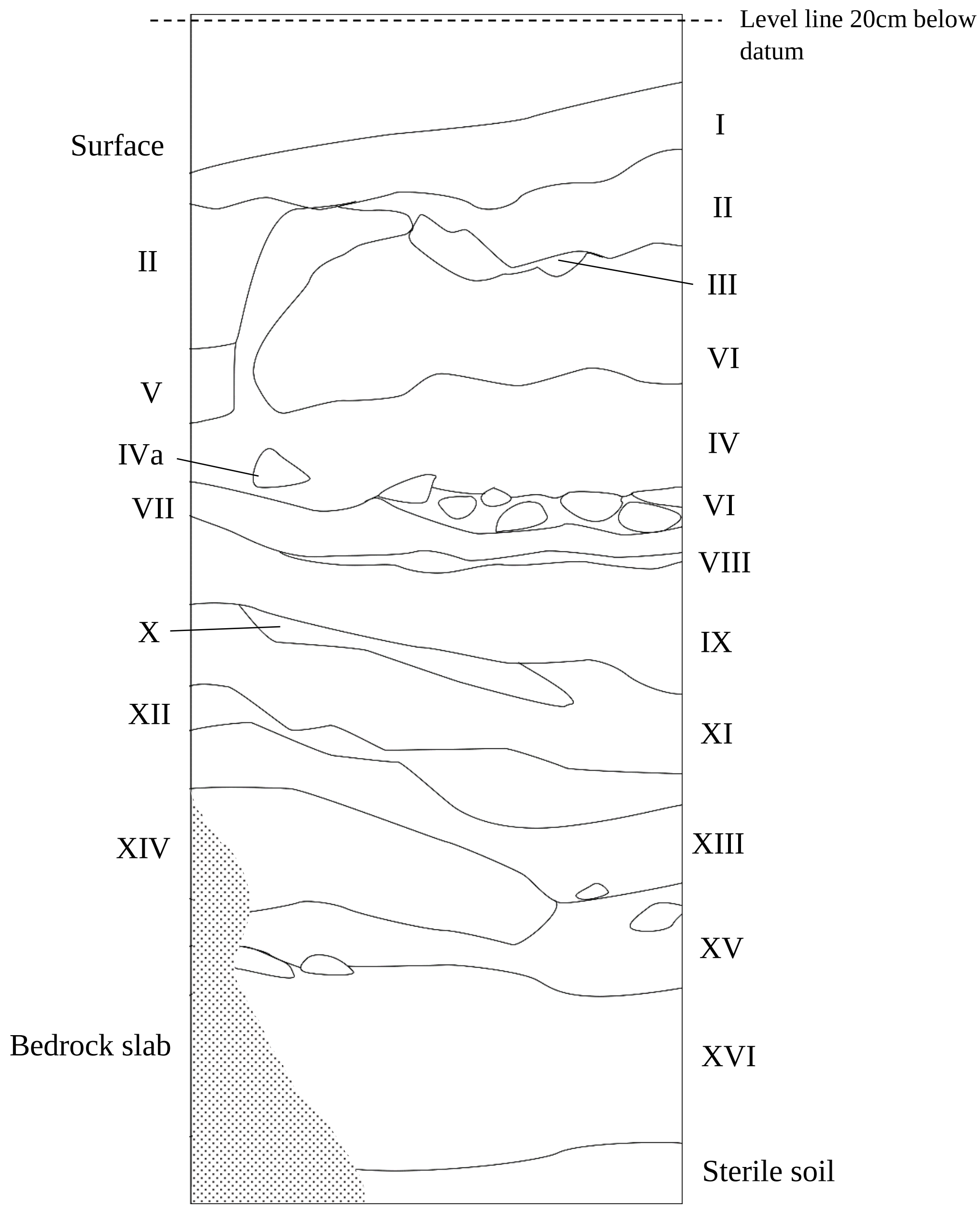

FIGURE 12: PROFILE OF WEST WALL OF UNIT 13E, 20N AT SCRI-849

I – Moderately compact topsoil, 1% shell, red-brown silty loam, 5% charcoal
II – Highly compact, heavily bioturbated (modern plants) red-brown silty loam, 1% shell
III – Loosely consolidated, poorly-sorted (waterlain lens), 15% rounded to sub-angular non-cultural rock, 20% shell, gray-brown silty loam
IV – Loosely consolidated, dense midden, 90% shell, gray ashy loam
IVa – Dense *Mytilus californianus* feature within the same matrix as stratum IV
V – Loosely consolidated, sparse midden, 30% shell, red-brown silt
VI – Highly compact, primarily angular to sub-angular boulders >10cm dia., very dark ashy silt, significant charcoal
VII – Loosely consolidated, dense midden, 75% shell, gray-brown ashy silty loam
VIII – Loosely consolidated, dense midden, 75% shell, brown silty loam
IX – Moderately loose, dense midden, 75% shell, 5% angular to sub-angular cobbles, red-brown silty loam
X – Moderately compact, very dense midden lens, 90% shell, gray ashy silt
XI – Moderately compact, dense midden, 80% shell (~10% whole shell), gray-brown silt
XII – Moderately loose, dense midden, 80% shell, 10% rounded to sub-angular pebbles, brown silty loam
XIII – Moderately loose, moderately dense midden, 50% shell, 10% rounded to sub-angular pebbles, red-brown silty loam
XIV – Loosely consolidated, moderately dense midden, 50% shell, gray-brown silty loam
XV – Loosely consolidated, low-density midden, 25% shell, yellow-brown silty loam
XVI – Moderately loose, moderately dense midden, 50% shell, 40% sub-angular to angular pebbles and cobbles, yellow-brown silty loam

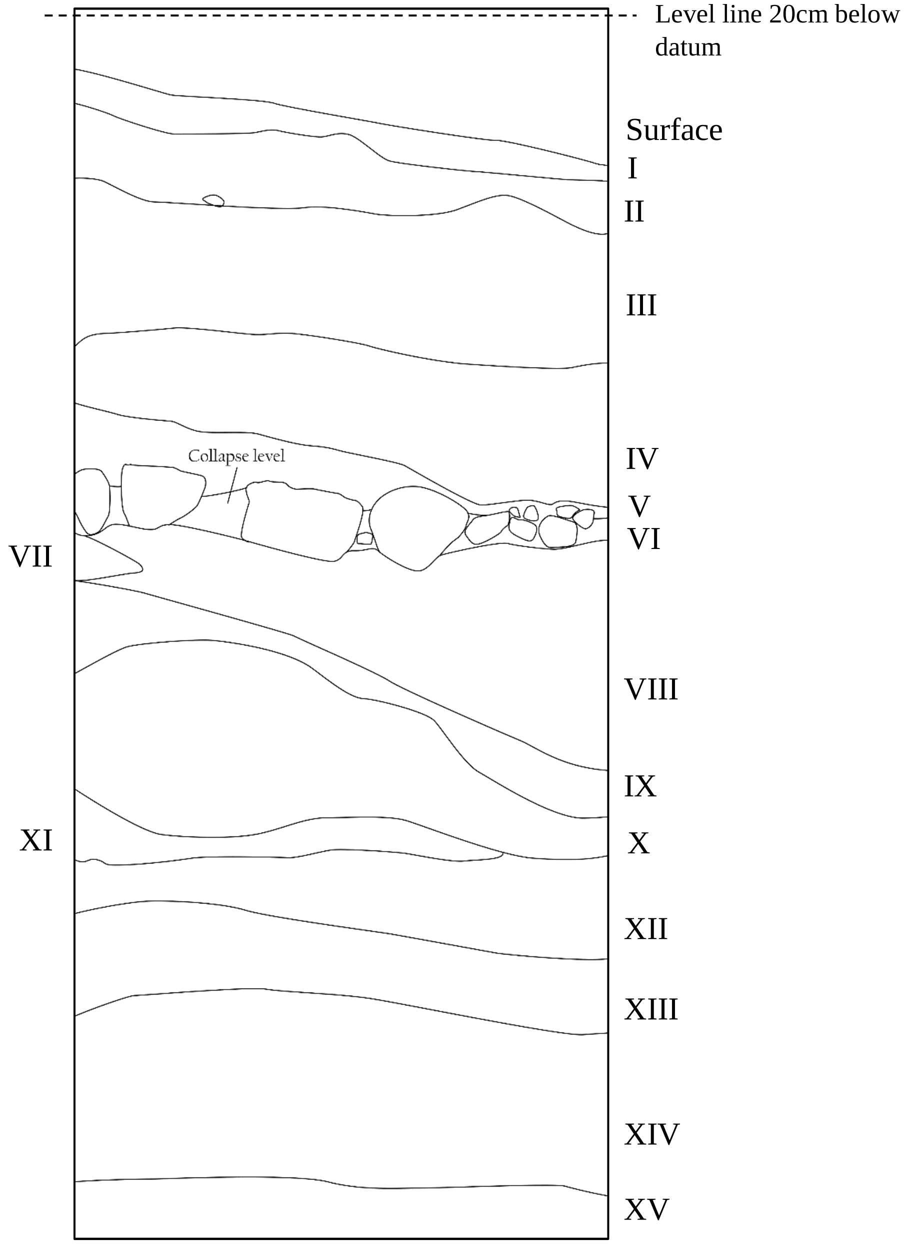

FIGURE 13: PROFILE OF NORTH WALL OF UNIT 13E, 20N AT SCRI-849

I – Moderately compact topsoil, 1% shell, red-brown silty loam, 5% charcoal
II – Highly compact, heavily bioturbated (modern plants) red-brown silty loam, 1% shell
III – Loosely consolidated, poorly-sorted, 15% angular to sub-angular non-cultural rock, 20% shell, brown silty loam
IV – Loosely consolidated, dense midden, 90% shell, gray ashy loam
V – Loosely consolidated, dense midden, 90% shell, very dark ashy silt, significant charcoal
VI – Highly compact, primarily angular boulders >10cm dia., very dark ashy silt, significant charcoal
VII – Loosely consolidated, moderately dense midden, 60% shell, gray-brown ashy silt
VIII – Loosely consolidated, dense midden, 75% shell, gray-brown ashy silt
IX – Moderately loose, dense midden, 75% shell, 5% angular to sub-angular cobbles, red-brown silty loam
X – Moderately compact, very dense midden, 90% shell, gray ashy silt
XI – Moderately compact, dense midden, 80% shell (~10% whole shell), gray-brown silt
XII – Moderately loose, dense midden, 80% shell, 10% rounded to sub-angular pebbles, brown silty loam
XIII – Moderately loose, moderately dense midden, 60% shell, 10% rounded to sub-angular pebbles, red-brown silty loam
XIV – Loosely consolidated, low-density midden, 35% shell, yellow-brown silty loam
XV – Compact, sterile soil, 5% shell (from upper levels), 5% boulders <10cm dia., yellow clayey silt

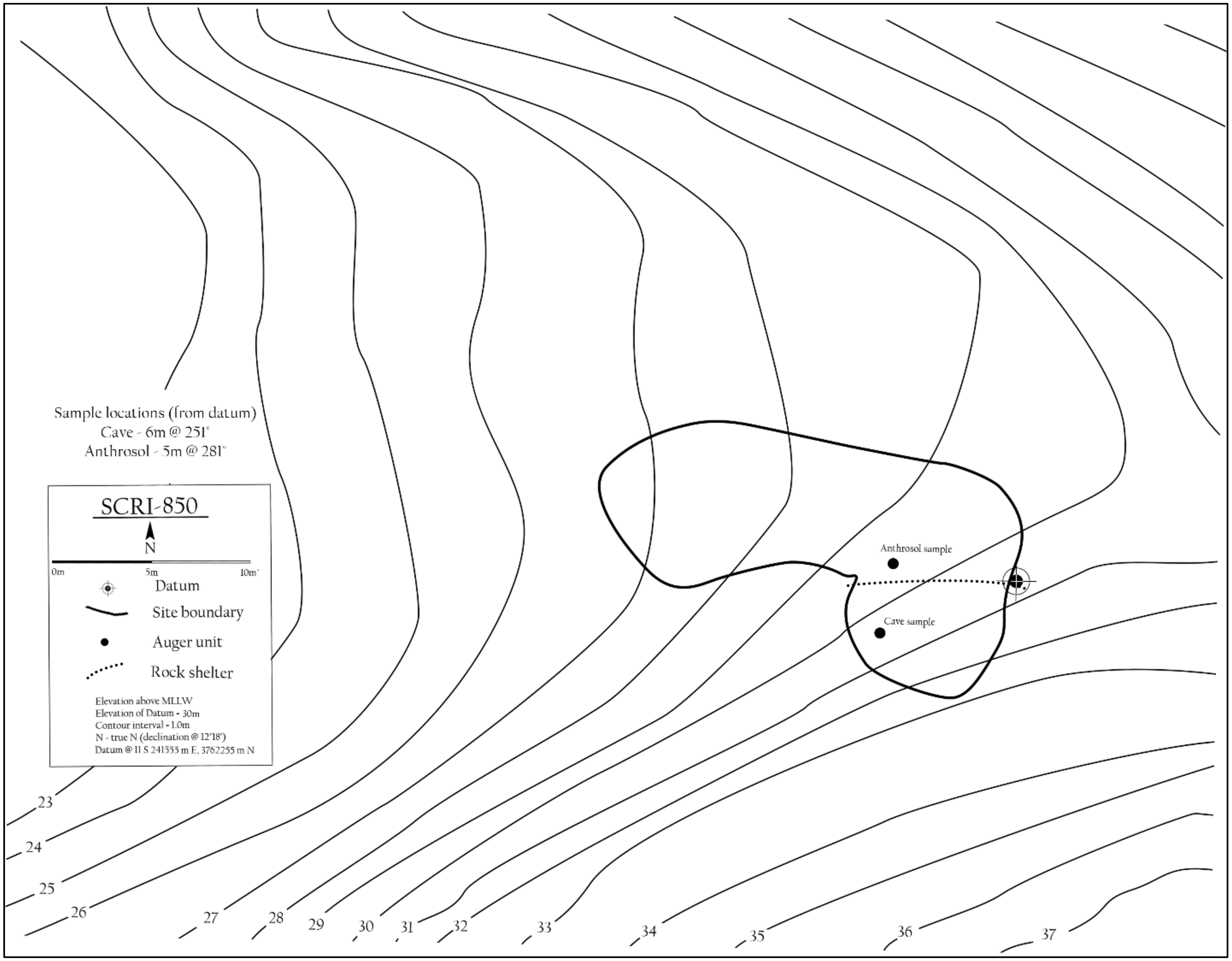

FIGURE 14: MAP OF SCRI-850

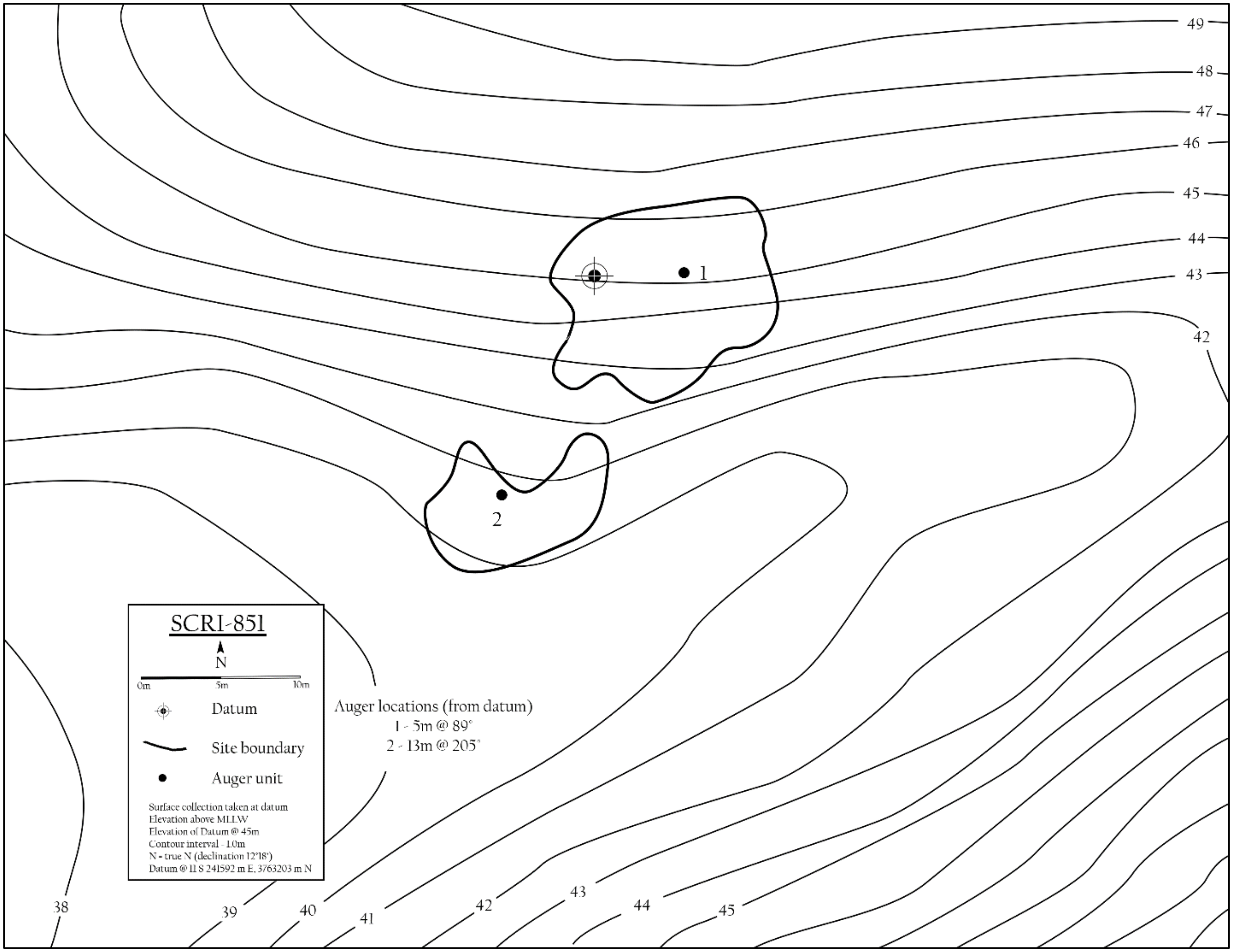

FIGURE 15: MAP OF SCRI-851

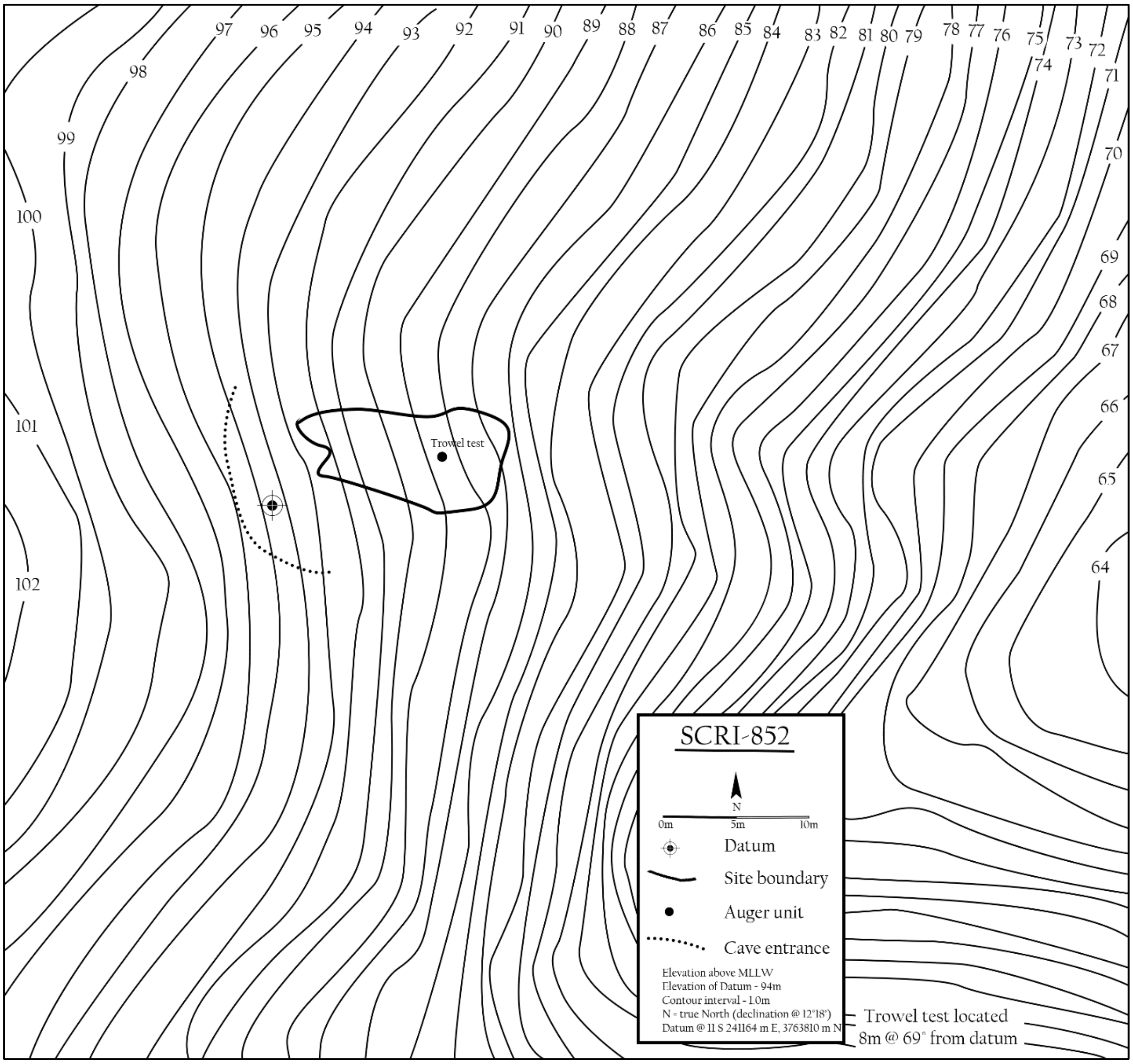

FIGURE 16: MAP OF SCRI-852

FIGURE 17: PHOTOGRAPHS OF SHELL AND WORKED BONE ARTIFACTS (SCALE = 5CM)
(a) *H. rufescens* fishhook blank; (b) J-shaped fishhook-in-production; (d,e) *O. biplicata* wall beads; (f) *O. biplicata* lipped callus bead; (g) *O. biplicata* needle-drilled bead; (h) *Trivia sp.* punched bead; (i) bird-bone whistle; (j) modified whole *H. cracherodii*

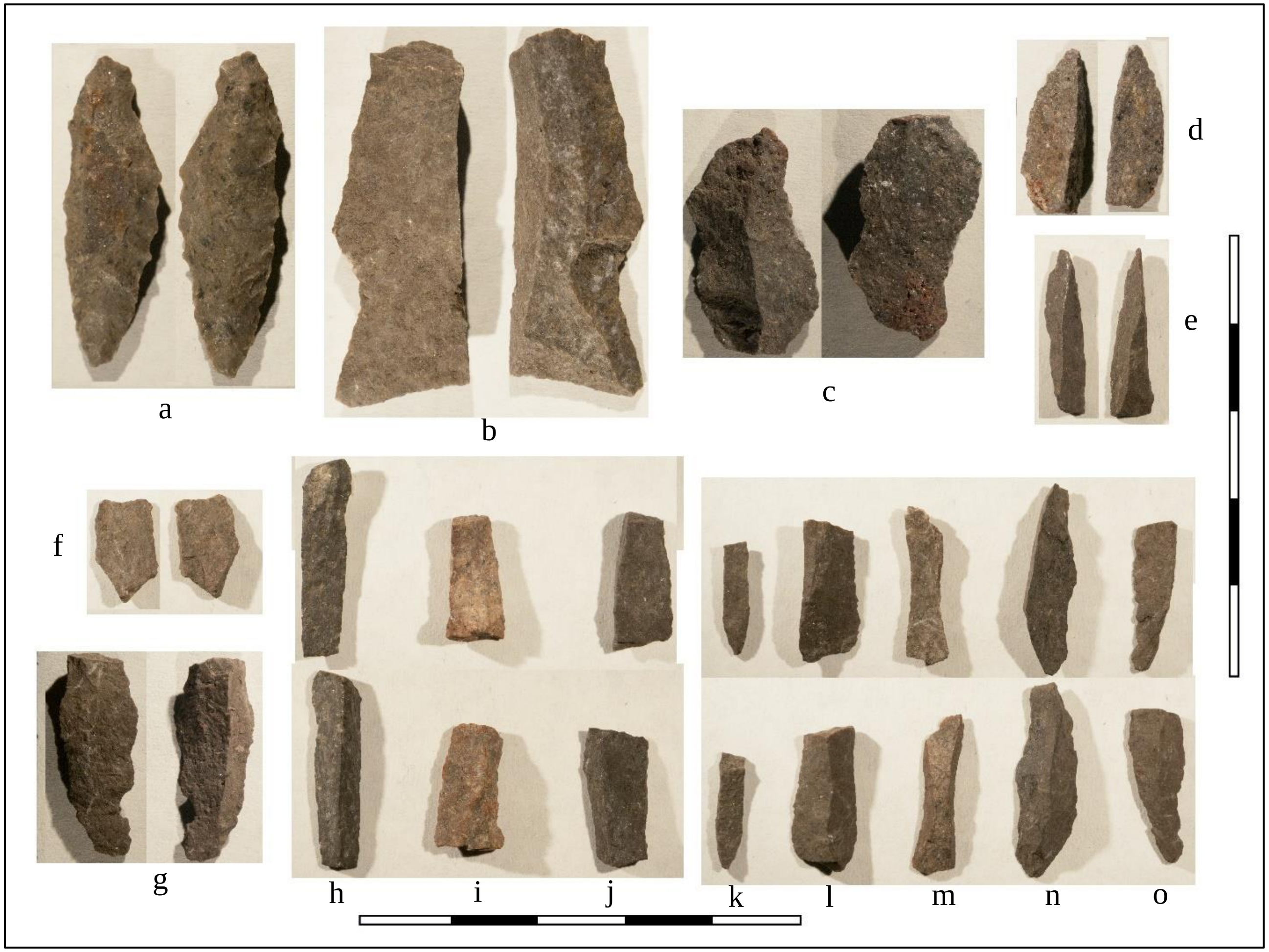

FIGURE 18A: PHOTOGRAPHS OF IGNEOUS BIFACES, BLADES, MICROBLADES, AND MICRODRILLS (SCALE = 5CM)
(a) Leaf-shaped point; (b,c,g) Unretouched blades; (d, e) Triangular (undiagnostic) microdrills; (f) Flake-drill (type A); (h-o) Triangular (undiagnostic) microblades

FIGURE18B: PHOTOGRAPHS OF IGNEOUS CORES AND RETOUCHED FLAKES (SCALE = 5CM)
(a) Split core with multiple flake scars (three views); (b,d) Retouched flakes; (c,e) Microblade cores (microblade scars visible on left side of both images)

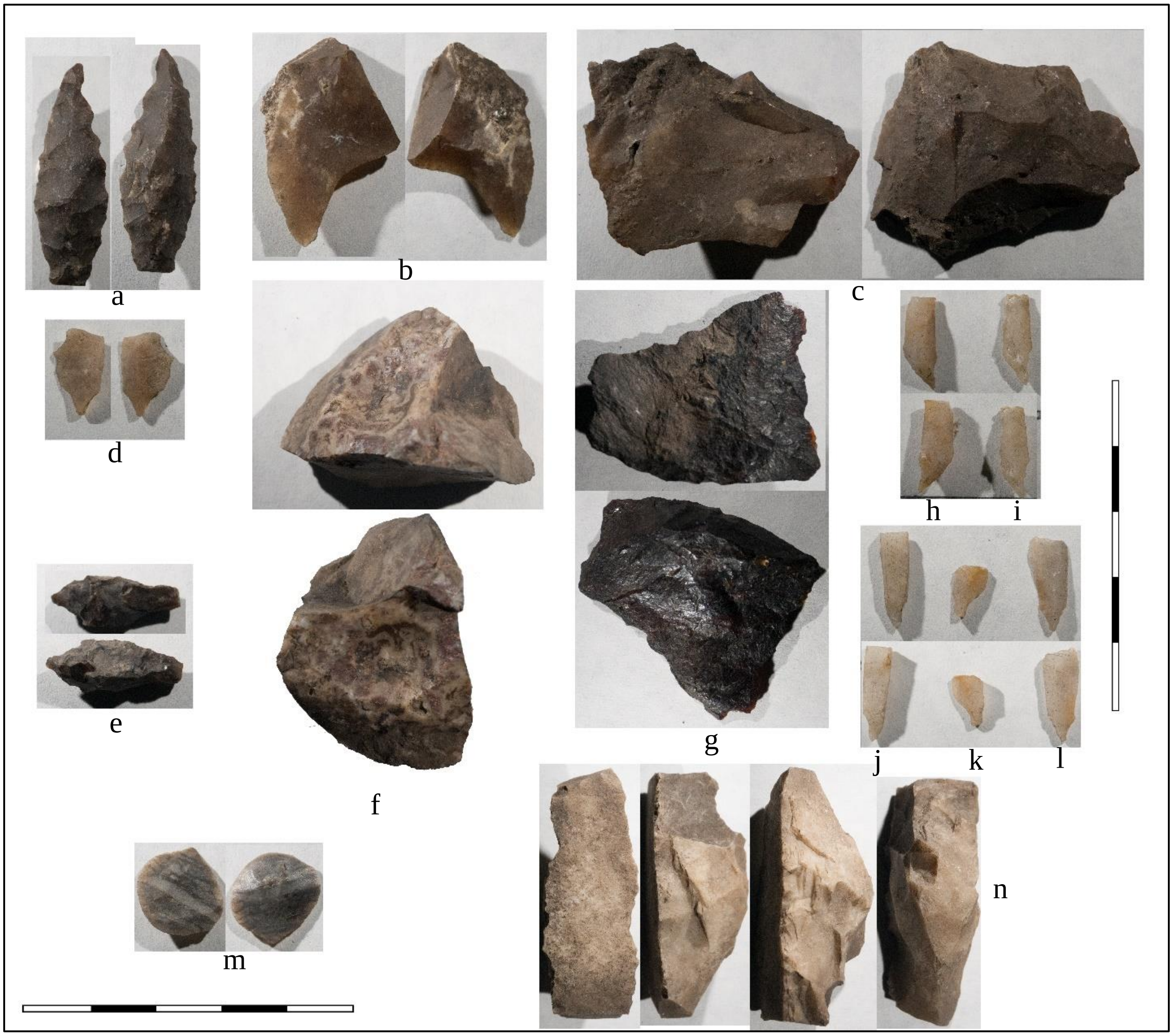

FIGURE18C: PHOTOGRAPHS OF CHERT CORES, BIFACES, MACRODRILLS, AND MICRODRILLS (SCALE = 5CM)

(a) Leaf-shaped point; (b) Flake (no retouch or heat treatment); (c) Microblade core; (d) Flake-drill (type B); (e,n) Macrodrills (undiagnostic); (f) Heat-treated chert core (potlidding/crazing evident on pictured surface); (g) Heat-treated flake (possible microblade core); (h,i) Microdrills (TDR); (j,k,l) Microdrills (Trapezoidal); (m) Chert potlid

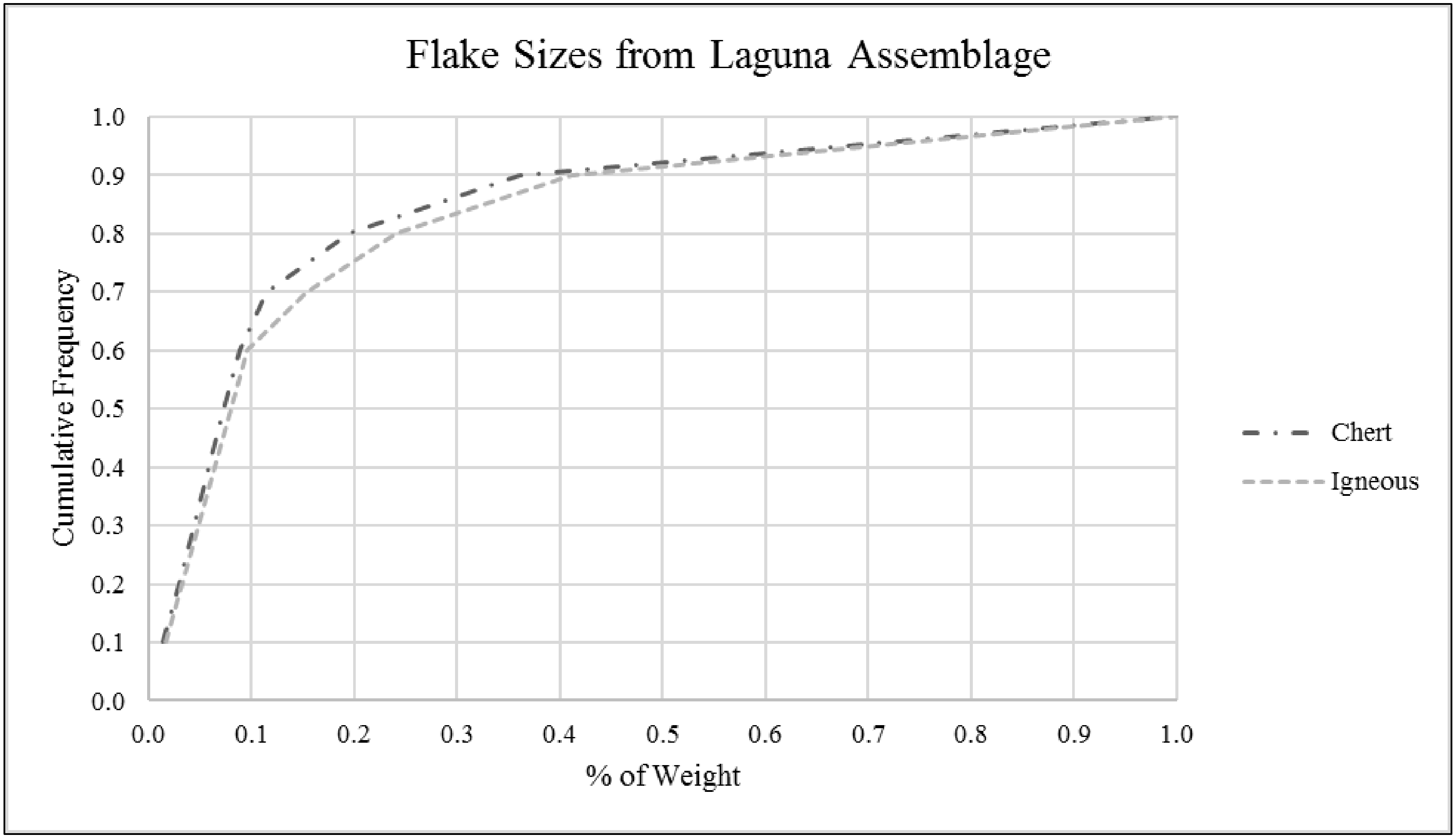

FIGURE 19: FLAKE SIZES FROM LAGUNA ASSEMBLAGE

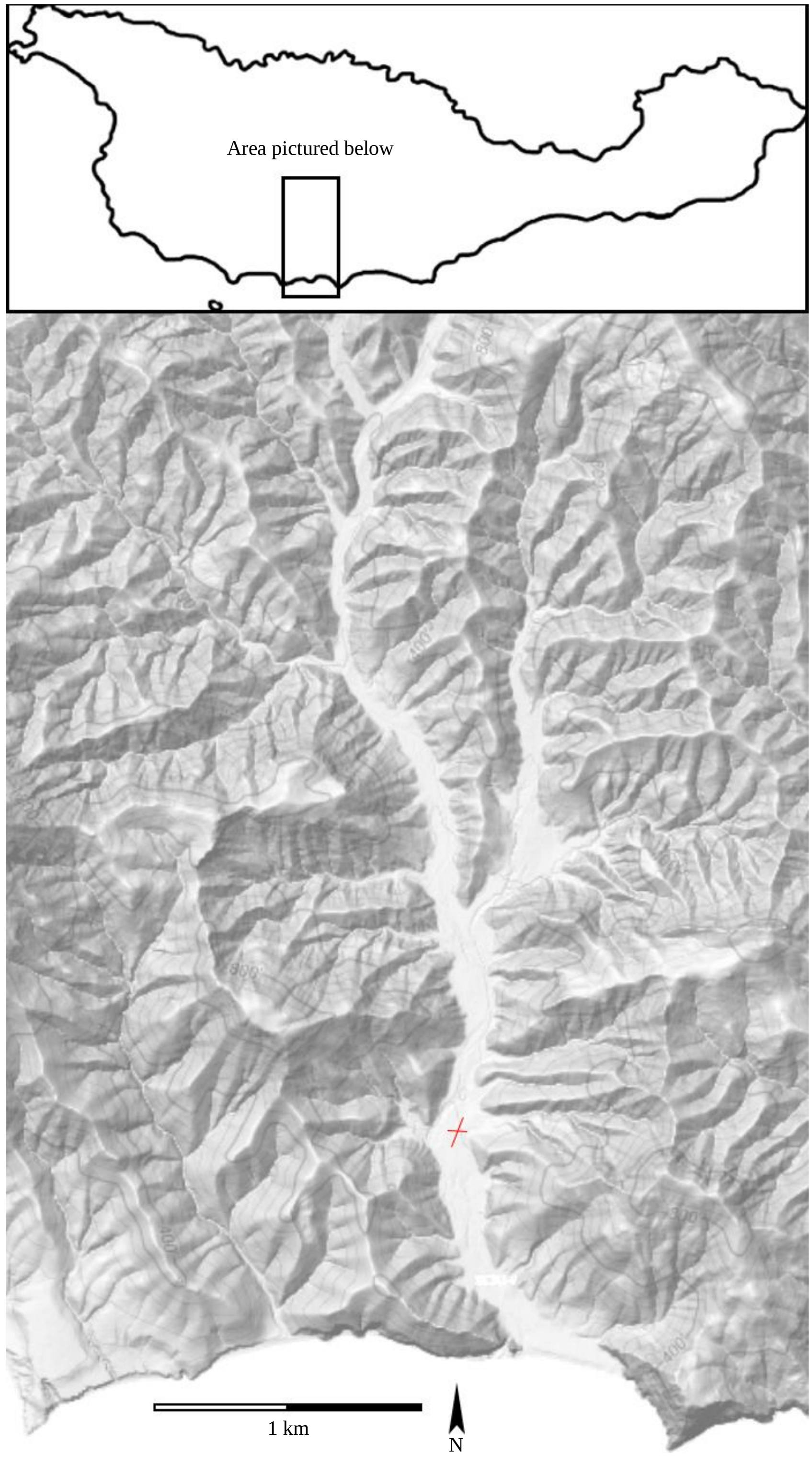

FIGURE 20: MAP OF AUGER TRANSECTS IN CENTER OF LAGUNA CANYON
(COORDINATES OF CENTER: 11S 241375 M E 3762466 M N; IMAGE CREATED BY S. D. SUNELL, BASE LAYER FROM GOOGLE EARTH)

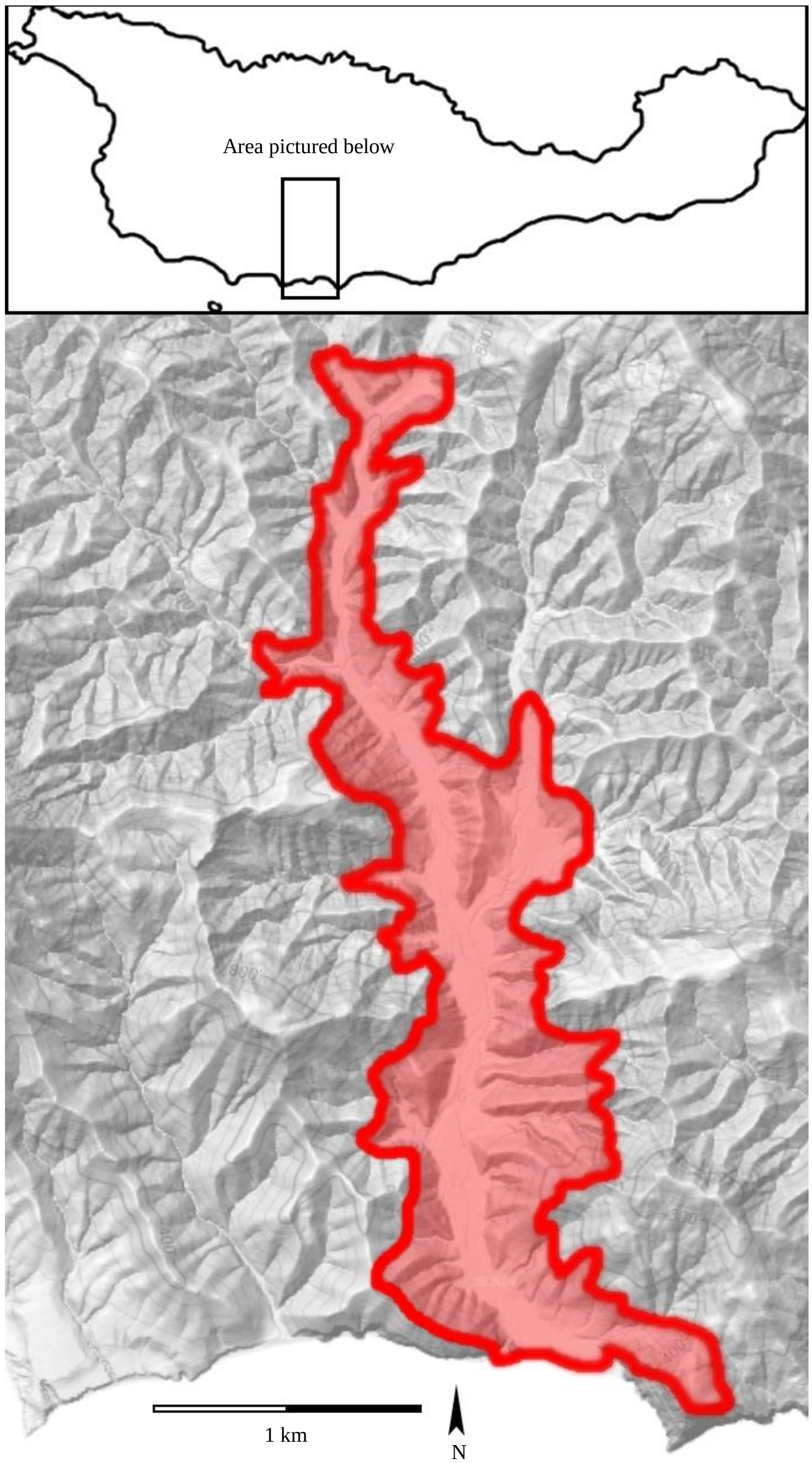

FIGURE 21: AREAS SURVEYED IN LAGUNA CANYON
(IMAGE CREATED BY S. D. SUNELL, BASE LAYER FROM GOOGLE EARTH)

APPENDIX D - TABLES

TABLE 1

ARCHAEOLOGICAL PERIODS ON SCRI[1]

Period	Age (BC/AD)	Age (BP)
Early	2500 – 600 B.C.	4450 – 2550 BP
early Middle	600 B.C. – 600 A.D.	2550 – 1350 BP
late Middle	600 – 1150 A.D.	1350 – 800 BP
Transitional	1150 – 1300 A. D.	800 – 650 BP
Late	1300 – 1782 A.D.	650 – 168 BP
Historic	1782 A.D. – Present	168 BP – Present
Middle Holocene	4500 – 1500 B.C.	6450 – 3450 BP
Late Holocene	1500 B.C. – Present	3450 BP – Present

[1]Adapted from: Arnold 2001a and Kennett 2005

TABLE 2

RADIOCARBON DATA FOR SITES IN THIS STUDY

Lab No. [a]	Site	Unit	Depth (cm)	Material	Uncalibrated Age (1σ) [b]	Calibrated Age (1σ)[c]
D-AMS 007536	SCRI-845	15E, 27N	030-035	Wood charcoal	1222±22	764 - 884 A.D.
D-AMS 007537	SCRI-845	15E, 27N	030-035	M. californianus	1735±25	829 - 1020 A.D.
D-AMS 003502	SCRI-845	15E, 27N	045-050	Wood charcoal	1356±27	631 - 695 A.D.
D-AMS 003503	SCRI-845	15E, 27N	065-070	M. californianus	2038±22	561 - 689 A.D.
D-AMS 016503	SCRI-849	13E, 20N	045-050	Wood charcoal	90±19	Modern[d]
D-AMS 016502	SCRI-849	13E, 20N	080-085	Wood charcoal	804±26	1187 - 1272 A.D.

[a] All samples submitted to DirectAMS in Bothell, WA
[b] Uncorrected "radiocarbon date" in years BP
[c] Conversions based on OxCal v4.3.2 (Bronk Ramsey 2017); IntCal13/Marine13 (Reimer et al. 2013); Delta-R from Jazwa et al. (2013)
[d] Date taken from disturbed site component (see Figure 12), with 26.2% probability of the true age falling between 1693-1728 AD and a 73.8% of the age falling between 1812-1919 AD.

Two radiocarbon samples are unreported in the above table: D-AMS 016504 and D-AMS 016505. Due to measurement incompatibilities at the lab during processing, fractionation values could not be obtained and were set to -25‰. Calibration results in dates significantly younger than all other lines of evidence (other 14C dates, deposits, stratigraphy, and artifactual contents) would suggest. Lab-reported uncalibrated ages were 1220±19 for sample D-AMS 016504 and 1301±18 for sample D-AMS 016505. Calibrated ages resulting from these values were 1330-1447 AD and 1289-1404 AD, respectively. D-AMS 016504 came from SCRI-849, 13E, 20N at 115-120cm. D-AMS 016505 came from SCRI-849, 13E, 20N at 155-160cm.

TABLE 3

TYPICAL PATTERNS OF DIAGNOSTIC MIDDLE AND LATE PERIOD ARTIFACTS AT ISLAND SITES

Period	Age	Description
late Middle	1300-650BP	Leaf-shaped points, Olivella wall and barrel beads, J-shaped fishhooks, trapezoidal microblades/microdrills
Late	650-200BP	Leaf-shaped and concave-base points, triangular (dorsal retouch) drills, C-shaped fishhooks, Olivella callus beads

TABLE 4

OLIVELLA DETRITUS FROM AUGERS

Site	Unit	Depth (cm)	Assemblage[a]	Count	Weight (g)
SCRI-843	2S	020-050	M	6	0.85
SCRI-843	3S	020-030	M	1	0.15
SCRI-845	1S	000-020	M	3	0.44
SCRI-845	2S	000-020	M	28	3.89
SCRI-845	3S	000-050	M	20	4.28
SCRI-845	4S	000-100	M	9	0.87
SCRI-845	1E	000-020	M	6	0.56
SCRI-845	2E	000-040	M	23	2.84
SCRI-848	2E	010-020	M	4	0.33
SCRI-849	1E	000-010	M/T[b]	1	0.21
SCRI-849	2E	000-040	M/T[b]	2	0.44
SCRI-849	3E	000-090	T	14	2.42
SCRI-849	3E	080-090	M	5	1.09
SCRI-851	2	000-020	M	2	0.30

.[a] M = Middle, T = Transitional
b Augers 1E/2E were located in eroded deposits of indeterminate assemblage composition, likely representing much of the occupational span of the site and not any single period (including Late/Historic period materials).

TABLE 5

OLIVELLA WALL[a] BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM AUGERS

Site	Unit	Depth (cm)	Blank	BIP	Bead	Total
SCRI-843	2S	030-040	-	-	1	1
SCRI-845	3S	000-020	4	-	-	4
SCRI-845	4S	050-110	4	2	-	6
SCRI-845	1E	000-010	-	1	-	1
SCRI-849	2E	030-040	-	1	-	1
SCRI-849	3E	080-090	-	1	-	1
SCRI-851	2	030-040	-	-	1	1

[a] No Callus bead production material was recovered during augering

TABLE 6

OLIVELLA DETRITUS FROM EXCAVATIONS[a]

Site	Unit	Depth (cm)	Count	Weight (g)
SCRI-845	15E, 27N	010-015	23	5.61
SCRI-845	15E, 27N	030-035	46	13.30
SCRI-845	15E, 27N	035-040	53	12.11
SCRI-845	15E, 27N	040-045	23	5.49
SCRI-845	15E, 27N	045-050	71	7.19
SCRI-845	15E, 27N	050-055	42	8.26
SCRI-845	15E, 27N	055-060	24	4.75
SCRI-845	15E, 27N	060-065	20	3.32
SCRI-845	18E, 18N	005-010	149	21.34
SCRI-845	18E, 18N	020-025	60	14.85
SCRI-845	18E, 18N	025-030	67	10.92
SCRI-845	18E, 19N	015-020	116	19.17
SCRI-849	13E, 20N	075-080	105	10.65
SCRI-849	13E, 20N	085-093	180	24.19
SCRI-849	13E, 20N	105-110	97	9.52
SCRI-849	13E, 20N	115-120	68	9.88

.[a] Totals in this table are drawn from fully sorted and analyzed levels

TABLE 7

OLIVELLA BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM SCRI-845, 15E, 27N

	WALL				CALLUS			
Depth (cm)	Blank	BIP	Bead	Total	Blank	BIP	Bead	Total
010-015	-	1	-	1	-	-	-	-
030-035	-	1	-	1	-	-	-	-
035-040	-	2	2	4	-	-	-	-
040-045	-	1	2	3	-	-	-	-
045-050	1	1	1	3	-	-	-	-
050-055	-	-	1	1	-	-	-	-
055-060	-	1	-	1	-	-	-	-
060-065	-	1	-	1	-	-	-	-

TABLE 8

OLIVELLA BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM SCRI-845, 18E, 18/19N

	WALL				CALLUS			
Depth (cm)	Blank	BIP	Bead	Total	Blank	BIP	Bead	Total
005-010[a]	-	8	1	9	-	-	-	-
015-020[b]	1	4	1	6	-	-	-	-
020-025[a]	2	-	1	3	-	-	-	-
025-030[a]	-	6	-	6	-	-	-	-

[a] 18E, 18N
[b] 18E, 19N

TABLE 9

OLIVELLA BEAD BLANKS, BEADS-IN-PRODUCTION, AND BEADS FROM SCRI-849, 13E, 20N

	WALL				CALLUS			
Depth (cm)	Blank	BIP	Bead	Total	Blank	BIP	Bead	Total
035-040	-	-	-	-	-	-	1	1
040-045	-	-	-	-	-	-	1	1
050-055	-	-	1	1	-	-	4	4
055-060	-	1	-	1	-	-	-	-
070-075	1	-	-	1	-	1	-	1
075-080	3	4	-	7	-	-	2	2
080-085	-	1	-	1	-	-	-	-
085-093	-	8	2	10	7	-	1	1
093-095	-	-	1	1	-	-	-	-
095-100	-	2	4	6	-	-	-	-
100-105	-	1	-	1	-	-	-	-
105-110	-	6	-	6	-	-	-	-
115-120	5	8	6	19	-	-	-	-
120-125	-	2	2	4	-	-	-	-
155-165	-	-	1	1	-	-	-	-

TABLE 10

OTHER TYPES OF OLIVELLA BEADS

Site	Unit	Depth	Type	Count	Weight
SCRI-845	15E, 27N	040-045	Spire-ground	1	1.51
SCRI-845	15E, 27N	055-060	Barrel	1	0.21
SCRI-845	15E, 27N	055-060	Spire-ground	1	0.18
SCRI-845	18E, 18N	025-030	Spire-ground	1	1.10
SCRI-849	13E, 20N	085-093	Barrel	1	0.24
SCRI-849	13E, 20N	085-093	Mini-barrel	2	0.05

TABLE 11

OTHER WORKED SHELL

Site	Unit	Depth	Material	Type	Count	Weight (g)
SCRI-845	15E, 27N	035-040	*H. rufescens*	Detritus	3	3.00
SCRI-845	15E, 27N	045-050	*Trivia sp.*	Bead	1	0.15
SCRI-845	15E, 27N	045-050	*H. rufescens*	Bead blank	1	0.77
SCRI-845	15E, 27N	055-060	*Trivia sp.*	Bead	1	0.40
SCRI-845	18E, 18N	020-025	*Trivia sp.*	Bead	1	0.18
SCRI-845	18E, 18N	020-025	*H. rufescens*	Detritus	1	0.92
SCRI-845	18E, 18N	025-030	*H. rufescens*	Detritus	1	0.24
SCRI-849	13E, 20N	075-080	*M. californianus*	Bead	1	0.01
SCRI-849	13E, 20N	085-093	*M. californianus*	BIP	1	0.05
SCRI-849	13E, 20N	085-093	*H. cracherodii*	Chipped/Modified	1	4.58
SCRI-849	13E, 20N	085-093	*Ostrea sp.*	Chipped/Modified	1	12.11
SCRI-849	13E, 20N	105-110	*Haliotis sp.*	Ornament-in-production[b]	2	0.49
SCRI-849	13E, 20N	105-110	*H. rufescens*	Chipped/Modified	1	0.69

[a] Rectangular *Haliotis* pendants lacking epidermis, of the types King assigns to periods M5a and M5b, 900-1050 A.D. (King 1990:252)

TABLE 12

CORES FROM EXCAVATIONS AT SCRI-845, UNIT 15E, 27N

Depth	Chert			Igneous		
	Core	Microblade Core	Total	Core	Microblade Core	Total
010-015	1[b]	-	1	1	3	4
015-020	-	-	-	1	1	2
020-025	-	1[a]	1	1	1	2
025-030	3[e] (1[a],2[b])	-	3	1	8	9
030-035	1[b, e]	-	1	1	4	5
035-040	6[a] (3[e])	4 (3[a],1[d])	10	3	8	11
040-045	1[a]	1[a]	2	-	-	-
045-050[f]	1[a]	2[a]	3	1	5	6
050-055	6[a] (5[e])	2[a]	8	-	6	6
055-060[f]	-	5 (1[a], 4[c])	5	-	4	4
060-065	2 (1[a, e], 1[c])	2[a]	4	2	5	7
065-070	1[b]	-	1	1	-	1
070-075	1[b, e]	-	1	1	-	1

[a] SCRI
[b] Monterey
[c] Other (exotic)
[d] Fused shale
[e] Heat treated
[f] Quartzite cores not included in totals, 1 in each level

TABLE 13

CORES FROM EXCAVATIONS AT SCRI-845, UNITS 18E, 18/19N

Unit	Depth	Chert			Igneous		
		Core	Microblade Core	Total	Core	Microblade Core	Total
18E, 18N	000-005	-	-	-	1	-	1
18E, 18N	005-010	1[a]	-	1	1	2	3
18E, 19N	010-015	-	-	-	3	4	7
18E, 19N	015-020	2 (1[a], 1[b])	-	2	1	1	2
18E, 18N	015-020[f]	1[a, e]	-	1	-	2	2
18E, 18N	020-025	5[a] (2[e])	1[a]	6	1	7	8
18E, 18N	025-030[g]	10[a]	-	10	2	-	2
18E, 18N	030-035	2[a, e]	-	2	-	1	1

[a] SCRI
[b] Monterey
[c] Other (exotic)
[d] Fused shale
[e] Heat treated
[f] 1 crystalline core not included in totals
[g] This unit/level dealt with in greater detail in Table 15 (below)

TABLE 14

CORES FROM EXCAVATIONS AT SCRI-849, UNITS 13/14E, 20N

Unit	Depth	Chert			Igneous		
		Core	Microblade Core	Total	Core	Microblade Core	Total
14E, 20N	040-045*	-	1[a]	1	1	-	1
13E, 20N	040-045*	-	-	-	1	-	1
14E, 20N	045-050*	-	-	-	1	1	2
14E, 20N	050-055*	-	-	-	2	-	2
14E, 20N	055-060*	-	-	-	2	-	2
14E, 20N	060-065*	-	-	-	3	-	3
13E, 20N	065-070*	-	-	-	1	-	1
13E, 20N	070-075*	-	-	-	3	-	3
13E, 20N	080-085	-	-	-	1	1	2
13E, 20N	085-093	-	-	-	6	7	13
13E, 20N	093-095	-	-	-	1	-	1
13E, 20N	095-100	-	-	-	2	-	2
13E, 20N	100-105	-	-	-	2	6	8
13E, 20N	105-110	-	-	-	1	6	7
13E, 20N	115-120	-	1[a]	1	-	4	4
13E, 20N	125-130	-	-	-	1	-	1
13E, 20N	150-155	-	-	-	-	2	2

* Above collapse level, out of context (see site description in Appendix B)
[a] SCRI
[b] Monterey
[c] Other (exotic)
[d] Fused shale
[e] Heat treated
[f] 1 crystalline core not included in totals
[g] This unit/level dealt with in greater detail in Table 15 (below)

TABLE 15

ARTIFACTS ASSOCIATED WITH IN-SITU PRODUCTION EPISODE FROM SCRI-845*

Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
Chert (Monterey)	Flake	8.91	13.00	2.39	0.27
Chert (Monterey)	Flake	13.70	4.19	2.00	0.17
Chert (Monterey)	Flake	15.29	16.59	2.61	0.74
Chert (Monterey)	Flake (biface-thinning)	4.26	5.28	0.60	0.04
Chert (Monterey)	Flake (biface-thinning)	9.11	5.30	0.48	0.04
Chert (SCRI)	Core	17.19	9.09	9.42	1.38
Chert (SCRI)	Core	26.50	34.71	1.49	10.46
Chert (SCRI)	Core	27.71	35.31	27.10	18.89
Chert (SCRI)	Core (heat treated)	24.51	17.01	8.74	2.85
Chert (SCRI)	Core (heat treated)	32.39	22.91	11.51	8.05
Chert (SCRI)	Core (microblade)	14.09	23.51	3.59	1.89
Chert (SCRI)	Debitage	4.29	3.51	2.00	0.02
Chert (SCRI)	Debitage	4.39	3.40	1.70	0.02
Chert (SCRI)	Debitage	4.59	4.18	1.50	0.02
Chert (SCRI)	Debitage	5.00	4.22	0.89	0.04
Chert (SCRI)	Debitage	5.81	5.80	3.81	0.13
Chert (SCRI)	Debitage	7.00	5.95	4.20	0.07
Chert (SCRI)	Debitage	7.49	6.22	1.19	0.04
Chert (SCRI)	Debitage	8.21	4.99	2.21	0.08
Chert (SCRI)	Debitage	9.12	4.29	1.61	0.04
Chert (SCRI)	Debitage	9.89	5.02	3.33	0.12
Chert (SCRI)	Debitage	11.52	9.70	4.64	0.34
Chert (SCRI)	Debitage	12.01	7.39	5.85	0.37
Chert (SCRI)	Debitage	13.11	5.59	5.01	0.24
Chert (SCRI)	Debitage	18.88	7.59	6.57	0.5
Chert (SCRI)	Flake	16.32	10.49	1.70	0.45
Chert (SCRI)	Flake	16.66	8.39	9.92	1.16
Chert (SCRI)	Flake	18.59	14.92	3.79	0.88
Chert (SCRI)	Flake	19.11	15.61	1.94	0.57
Chert (SCRI)	Flake	22.57	13.40	2.36	0.93
Chert (SCRI)	Flake	22.71	17.61	5.09	2.28
Chert (SCRI)	Flake	30.88	21.39	4.33	2.33
Chert (SCRI)	Flake (biface-thinning)	4.01	4.00	0.29	0
Chert (SCRI)	Flake (biface-thinning)	4.47	4.76	0.52	0.01
Chert (SCRI)	Flake (biface-thinning)	5.29	4.61	0.71	0.03
Chert (SCRI)	Flake (biface-thinning)	5.41	3.91	1.21	0.03

TABLE 15

ARTIFACTS ASSOCIATED WITH IN-SITU PRODUCTION EPISODE FROM SCRI-845*

Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
Chert (SCRI)	Flake (biface-thinning)	5.86	3.71	0.50	0
Chert (SCRI)	Flake (biface-thinning)	5.89	8.01	0.69	0.04
Chert (SCRI)	Flake (biface-thinning)	6.12	4.67	0.59	0.05
Chert (SCRI)	Flake (biface-thinning)	6.38	6.01	0.59	0.04
Chert (SCRI)	Flake (biface-thinning)	6.59	8.01	1.00	0.09
Chert (SCRI)	Flake (biface-thinning)	6.69	5.99	0.91	0.06
Chert (SCRI)	Flake (biface-thinning)	7.09	14.99	1.50	0.22
Chert (SCRI)	Flake (biface-thinning)	7.35	5.81	0.95	0.06
Chert (SCRI)	Flake (biface-thinning)	8.01	11.53	0.69	0.12
Chert (SCRI)	Flake (biface-thinning)	8.83	5.81	0.41	0.05
Chert (SCRI)	Flake (biface-thinning)	8.91	9.99	1.09	0.08
Chert (SCRI)	Flake (biface-thinning)	9.89	5.92	0.68	0.04
Chert (SCRI)	Flake (core rejuvenation)	29.35	34.28	6.11	7.55
Chert (SCRI)	Flake (core rejuvenation)	32.72	41.49	14.78	16.5
Chert (SCRI)	Flake (core rejuvenation)	36.80	30.92	12.90	17.25
Chert (SCRI)	Flake (core rejuvenation)	42.31	29.12	10.18	12.59
Chert (SCRI)	Flake (heat treated)	6.19	6.49	1.81	0.11
Chert (SCRI)	Flake (heat treated)	9.01	5.88	1.98	0.14
Chert (SCRI)	Flake (heat treated)	9.28	26.31	4.82	1.64
Chert (SCRI)	Flake (heat treated)	10.91	8.28	2.21	0.33
Chert (SCRI)	Flake (heat treated)	10.95	13.20	4.00	0.47
Chert (SCRI)	Flake (heat treated)	17.10	15.01	2.62	0.75
Chert (SCRI)	Flake (heat treated)	19.01	18.78	2.60	1.21
Chert (SCRI)	Flake (retouched)	20.76	9.04	1.32	0.39
Chert (SCRI)	Flake (retouched)	43.38	29.51	5.00	6.05
Chert (SCRI)	Flake (retouched)	49.49	28.01	7.91	10.26
Chert (SCRI)	Macrodrill (Undiagnostic)	20.19	7.73	6.87	1.06
Chert (SCRI)	Macrodrill (Undiagnostic)	37.88	13.72	15.76	10.92
Chert (SCRI)	Macrodrill bit	30.48	18.08	15.84	7.49
Chert (SCRI)	Microblade (Undiagnostic)	9.79	4.32	2.40	0.07
Chert (SCRI)	Microblade (Undiagnostic)	10.61	4.39	0.92	0.07
Chert (SCRI)	Microblade (Undiagnostic)	12.10	5.40	1.51	0.1
Chert (SCRI)	Microblade (Undiagnostic)	12.81	5.40	1.61	0.13
Chert (SCRI)	Microdrill bit	5.82	3.70	2.62	0
Chert (SCRI)	Potlid	5.15	5.00	1.61	0.02
Chert (SCRI)	Potlid	7.33	6.21	1.12	0.04

TABLE 15

ARTIFACTS ASSOCIATED WITH IN-SITU PRODUCTION EPISODE FROM SCRI-845*

Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
Igneous	Blade	9.31	6.10	1.00	0.13
Igneous	Blade	11.34	6.11	0.71	0.09
Igneous	Blade	21.49	10.70	4.41	0.86
Igneous	CET	39.50	31.01	10.79	14.22
Igneous	Core	53.71	44.31	14.42	25.96
Igneous	Core (microblade)	16.68	21.11	3.78	1.28
Igneous	Core (microblade)	27.29	29.01	9.71	6.22
Igneous	Core (microblade)	29.38	12.21	12.09	2.67
Igneous	Core (microblade)	30.09	31.40	10.40	7.91
Igneous	Core (microblade)	38.15	16.41	7.32	5.79
Igneous	Debitage	8.61	4.71	2.42	0.08
Igneous	Debitage	10.71	5.01	3.81	0.18
Igneous	Debitage	12.34	6.39	2.31	0.12
Igneous	Debitage	13.01	6.81	3.71	0.28
Igneous	Debitage	13.72	6.49	3.76	0.22
Igneous	Debitage	14.50	7.48	2.69	0.14
Igneous	Debitage	14.90	14.69	3.09	0.65
Igneous	Debitage	15.59	10.70	1.72	0.27
Igneous	Debitage	16.09	16.81	7.69	1.37
Igneous	Debitage	16.38	15.27	5.60	1.13
Igneous	Debitage	16.41	9.68	8.49	1.23
Igneous	Debitage	17.20	12.28	3.19	0.64
Igneous	Debitage	17.40	8.99	7.89	0.84
Igneous	Debitage	18.23	17.46	2.52	0.67
Igneous	Debitage	19.58	10.81	6.02	0.77
Igneous	Debitage	19.59	8.20	4.58	0.74
Igneous	Debitage	26.29	17.48	6.09	2.02
Igneous	Debitage	26.40	14.25	6.68	3.03
Igneous	Debitage	26.79	24.29	10.42	3.67
Igneous	Debitage	30.51	8.71	8.26	1.71
Igneous	Flake	2.97	26.71	3.90	1.58
Igneous	Flake	7.53	7.59	1.13	0.08
Igneous	Flake	8.22	15.01	2.97	0.48
Igneous	Flake	9.01	9.90	1.49	0.19
Igneous	Flake	9.57	9.10	1.41	0.14
Igneous	Flake	12.95	7.89	1.80	0.19

TABLE 15

ARTIFACTS ASSOCIATED WITH IN-SITU PRODUCTION EPISODE FROM SCRI-845*

Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
Igneous	Flake	14.91	19.40	4.68	1.52
Igneous	Flake	15.99	14.39	2.92	0.96
Igneous	Flake	16.01	8.70	2.78	0.67
Igneous	Flake	16.59	13.30	1.61	0.81
Igneous	Flake	16.86	26.59	5.72	2.41
Igneous	Flake	16.92	14.12	2.31	1.07
Igneous	Flake	18.83	21.20	2.90	1.55
Igneous	Flake	21.49	16.61	4.15	1.78
Igneous	Flake	24.25	21.88	6.17	3.37
Igneous	Flake	26.58	26.72	7.78	5.35
Igneous	Flake	28.83	22.09	10.11	6.29
Igneous	Flake	29.11	24.49	7.29	5.3
Igneous	Flake	33.39	19.51	7.23	4.71
Igneous	Flake	34.51	13.19	7.53	4.9
Igneous	Flake	45.70	28.59	8.93	13.49
Igneous	Flake (biface-thinning)	7.20	5.19	0.41	0.04
Igneous	Flake (biface-thinning)	8.01	4.71	0.81	0.04
Igneous	Flake (core rejuvenation)	12.99	41.24	2.10	2.14
Igneous	Flake (core rejuvenation)	40.31	24.02	5.41	6.22
Igneous	Flake (core rejuvenation)	43.79	15.65	7.61	6.06
Igneous	Flake (retouched)	58.16	43.42	13.16	23.79
Igneous	Flake-drill (type A)	10.51	5.20	4.22	0.14
Igneous	Flake-drill (type A)	13.38	6.99	1.78	0.22
Igneous	Flake-drill (type A)	15.71	9.99	5.21	0.81
Igneous	Flake-drill (type A)	21.48	8.61	2.61	0.49
Igneous	Flake-drill (type A)	22.29	10.50	5.41	0.89
Igneous	Macrodrill (Undiagnostic)	33.42	20.79	9.39	4.96
Igneous	Microblade (Undiagnostic)	13.12	4.80	2.11	0.06
Igneous	Microblade (Undiagnostic)	19.15	7.54	2.49	0.43
Igneous	Microblade (Undiagnostic)	21.21	11.62	2.92	0.71
Igneous	Microdrill (Trapezoidal)	16.18	6.12	2.66	0.13
Igneous	Microdrill (Undiagnostic)	5.21	6.58	3.79	0.29
Igneous	Microdrill (Undiagnostic)	28.20	7.30	4.09	0.7
Igneous	SET	66.49	25.71	11.30	17.61

*All material comes from Unit 18E, 18N at 020-025cm

TABLE 16

HEAT-TREATED LITHICS

Unit	Depth	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
15E, 27N	035-040	Chert (SCRI)	Flake (heat treated)	14.28	9.52	1.98	0.37
15E, 27N	035-040	Chert (SCRI)	Flake (heat treated)	15.81	14.51	1.60	0.43
15E, 27N	035-040	Chert (SCRI)	Flake (heat treated)	16.49	12.61	2.33	0.68
15E, 27N	035-040	Chert (SCRI)	Flake (heat treated)	24.21	13.79	1.90	0.87
15E, 27N	035-040	Chert (SCRI)	Flake (heat treated)	25.31	21.89	4.18	2.47
15E, 27N	035-040	Chert (SCRI)	Flake (heat treated)	51.70	26.23	6.52	11.05
15E, 27N	035-040	Chert (SCRI)	Projectile point	27.99	10.59	4.49	1.39
15E, 27N	035-040	Igneous	Debitage (heat treated)	21.36	23.01	8.52	2.81
15E, 27N	040-045	Chert (SCRI)	Debitage (heat treated)	5.41	5.41	1.38	0.05
15E, 27N	040-045	Chert (SCRI)	Debitage (heat treated)	5.60	4.68	2.30	0.13
15E, 27N	040-045	Chert (SCRI)	Flake (heat treated)	11.20	9.72	1.89	0.28
15E, 27N	040-045	Chert (SCRI)	Flake (heat treated)	17.28	10.62	2.21	0.58
15E, 27N	040-045	Igneous	Flake (heat treated)	23.40	23.75	3.29	2.69
15E, 27N	045-050	Igneous	Flake (heat treated)	11.70	12.99	6.23	0.69
15E, 27N	045-050	Igneous	Flake (heat treated)	15.02	9.60	4.38	0.46
15E, 27N	045-050	Igneous	Flake (heat treated)	17.63	13.19	4.12	0.59
15E, 27N	045-050	Chert (SCRI)	Debitage (heat treated)	9.48	6.09	3.30	0.14
15E, 27N	045-050	Chert (SCRI)	Debitage (heat treated)	9.68	6.68	4.22	0.2
15E, 27N	045-050	Chert (SCRI)	Debitage (heat treated)	19.70	12.86	3.68	0.89
15E, 27N	045-050	Chert (SCRI)	Debitage (heat treated)	23.10	17.92	4.59	1.73
15E, 27N	045-050	Chert (SCRI)	Flake (heat treated)	13.99	32.30	7.25	2.43
15E, 27N	045-050	Chert (SCRI)	Flake (heat treated)	14.69	7.14	2.51	0.26
15E, 27N	045-050	Chert (SCRI)	Flake (heat treated)	19.10	26.39	1.79	1.17
15E, 27N	045-050	Igneous	Flake (heat treated)	19.98	22.40	3.52	1.61
15E, 27N	050-055	Chert (SCRI)	Core (heat treated)	17.61	15.37	11.63	2.26
15E, 27N	050-055	Chert (SCRI)	Core (heat treated)	17.99	10.87	8.08	1.26
15E, 27N	050-055	Chert (SCRI)	Core (heat treated)	22.23	13.62	7.38	1.2
15E, 27N	050-055	Chert (SCRI)	Core (heat treated)	22.37	15.21	6.40	1.52
15E, 27N	050-055	Chert (SCRI)	Core (heat treated)	38.71	18.90	7.82	4.73
15E, 27N	055-060	Chert (Monterey)	Debitage (heat treated)	12.98	8.22	3.00	0.19
15E, 27N	055-060	Chert (Monterey)	Debitage (heat treated)	14.92	5.74	6.30	0.4
15E, 27N	055-060	Chert (Monterey)	Flake (heat treated)	9.38	11.04	2.11	0.23
15E, 27N	055-060	Chert (Monterey)	Flake (heat treated)	16.62	19.76	2.38	0.72
15E, 27N	055-060	Chert (Monterey)	Flake (heat treated)	19.48	20.27	4.85	2.36
15E, 27N	055-060	Chert (Monterey)	Flake (heat treated)	24.28	37.22	8.41	5.65
15E, 27N	055-060	Chert (SCRI)	Debitage (heat treated)	17.47	13.94	3.01	0.56

TABLE 16

HEAT-TREATED LITHICS

Unit	Depth	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
15E, 27N	055-060	Chert (SCRI)	Debitage (heat treated)	22.91	13.62	6.29	1.37
15E, 27N	055-060	Chert (SCRI)	Debitage (heat treated)	25.39	15.79	5.23	1.48
15E, 27N	055-060	Chert (SCRI)	Debitage (heat treated)	25.99	17.23	6.38	1.86
15E, 27N	055-060	Chert (SCRI)	Projectile point	34.01	11.66	8.39	2.86
15E, 27N	060-065	Chert (SCRI)	Core (heat treated)	35.58	20.41	14.80	11.53
15E, 27N	060-065	Chert (SCRI)	Debitage (heat treated)	11.89	9.57	3.90	0.4
15E, 27N	060-065	Chert (SCRI)	Debitage (heat treated)	12.33	4.30	3.78	0.08
15E, 27N	060-065	Chert (SCRI)	Debitage (heat treated)	17.49	12.49	2.79	0.52
15E, 27N	060-065	Chert (SCRI)	Flake (heat treated)	23.61	17.08	3.59	1.87
15E, 27N	060-065	Chert (SCRI)	Flake (heat treated)	24.42	19.98	5.62	2.88
15E, 27N	060-065	Chert (SCRI)	Flake (heat treated)	44.69	35.15	12.70	16.05
15E, 27N	065-070	Chert (Monterey)	Core (heat treated)	57.99	37.47	18.98	28.78
15E, 27N	070-075	Chert (Monterey)	Core (heat treated)	32.52	22.32	17.89	9.96
15E, 27N	070-075	Chert (SCRI)	Debitage (heat treated)	25.39	11.70	7.30	2.6
18E, 18N	005-010	Chert (SCRI)	Debitage (heat treated)	6.44	6.91	3.89	0.13
18E, 18N	005-010	Chert (SCRI)	Debitage (heat treated)	10.13	9.92	3.10	0.19
18E, 18N	005-010	Chert (SCRI)	Debitage (heat treated)	10.87	6.09	6.90	0.48
18E, 18N	005-010	Chert (SCRI)	Debitage (heat treated)	12.69	6.81	6.29	0.45
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	10.41	8.99	1.40	0.13
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	10.41	9.21	2.59	0.29
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	11.38	11.42	1.67	0.37
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	11.39	6.68	1.62	0.15
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	15.18	17.40	2.68	1.07
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	18.11	13.42	2.10	0.64
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	19.99	13.33	5.32	1.43
18E, 18N	005-010	Chert (SCRI)	Flake (heat treated)	20.28	12.92	2.10	0.7
18E, 18N	010-015	Chert (SCRI)	Flake (heat treated)	21.42	18.98	4.59	1.87
18E, 18N	010-015	Chert (SCRI)	Flake (heat treated)	41.63	29.46	11.78	12.74
18E, 18N	015-020	Chert (SCRI)	Core (heat treated)	32.51	20.42	13.21	12.9
18E, 18N	015-020	Chert (SCRI)	Debitage (heat treated)	15.34	14.51	7.14	1.36
18E, 18N	015-020	Chert (SCRI)	Debitage (heat treated)	36.89	19.21	8.83	3.55
18E, 18N	015-020	Chert (SCRI)	Flake (heat treated)	25.51	17.81	3.75	2.47
18E, 18N	020-025	Chert (SCRI)	Core (heat treated)	24.51	17.01	8.74	2.85
18E, 18N	020-025	Chert (SCRI)	Core (heat treated)	32.39	22.91	11.51	8.05
18E, 18N	020-025	Chert (SCRI)	Flake (heat treated)	6.19	6.49	1.81	0.11
18E, 18N	020-025	Chert (SCRI)	Flake (heat treated)	9.01	5.88	1.98	0.14

TABLE 16

HEAT-TREATED LITHICS

Unit	Depth	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
18E, 18N	020-025	Chert (SCRI)	Flake (heat treated)	9.28	26.31	4.82	1.64
18E, 18N	020-025	Chert (SCRI)	Flake (heat treated)	10.91	8.28	2.21	0.33
18E, 18N	020-025	Chert (SCRI)	Flake (heat treated)	10.95	13.20	4.00	0.47
18E, 18N	020-025	Chert (SCRI)	Flake (heat treated)	17.10	15.01	2.62	0.75
18E, 18N	020-025	Chert (SCRI)	Flake (heat treated)	19.01	18.78	2.60	1.21
18E, 18N	030-035	Chert (SCRI)	Core (heat treated)	31.99	33.17	17.79	19.6
18E, 18N	030-035	Chert (SCRI)	Core (heat treated)	37.88	19.50	11.52	8.74
18E, 19N	010-015	Chert (SCRI)	Debitage (heat treated)	15.61	8.21	5.42	0.57
18E, 19N	010-015	Chert (SCRI)	Debitage (heat treated)	26.00	15.21	5.34	1.76
18E, 19N	010-015	Chert (SCRI)	Projectile point	32.58	22.71	7.50	6.65
18E, 19N	015-020	Chert (SCRI)	Debitage (heat treated)	9.72	9.29	4.47	0.26
18E, 19N	015-020	Chert (SCRI)	Debitage (heat treated)	10.01	7.50	3.41	0.26
18E, 19N	015-020	Chert (SCRI)	Flake (heat treated)	5.32	9.71	0.91	0.07
18E, 19N	015-020	Chert (SCRI)	Flake (heat treated)	8.90	8.81	0.98	0.09
18E, 19N	015-020	Chert (SCRI)	Flake (heat treated)	12.99	14.51	1.89	0.39
18E, 19N	015-020	Chert (SCRI)	Flake (heat treated)	14.26	16.69	3.84	0.6
18E, 19N	015-020	Chert (SCRI)	Projectile point	16.96	10.35	4.51	0.71
13E, 20N	070-075	Chert (SCRI)	Flake (heat treated)	16.68	18.59	2.53	1.13
13E, 20N	075-080	Chert (SCRI)	Debitage (heat treated)	26.29	15.92	9.78	2.58
13E, 20N	075-080	Chert (SCRI)	Flake (heat treated)	19.83	11.51	4.68	1.11
13E, 20N	075-080	Igneous	Projectile point	36.28	11.35	5.40	1.84
13E, 20N	085-093	Chert (SCRI)	Flake (heat treated)	6.71	5.70	1.30	0.04
13E, 20N	085-093	Chert (SCRI)	Flake (heat treated)	17.24	12.18	4.14	0.78
13E, 20N	085-093	Chert (SCRI)	Flake (heat treated)	22.28	24.99	5.61	2.99
13E, 20N	115-120	Chert (SCRI)	Debitage (heat treated)	9.06	4.99	1.38	0.06
13E, 20N	115-120	Chert (SCRI)	Debitage (heat treated)	10.99	8.39	2.21	0.16
13E, 20N	115-120	Chert (SCRI)	Debitage (heat treated)	12.44	5.52	1.92	0.13
13E, 20N	115-120	Chert (SCRI)	Flake (heat treated)	27.38	23.90	5.90	2.3
13E, 20N	115-120	Chert (SCRI)	Flake (heat treated)	29.61	17.82	6.17	2.84

.

TABLE 17

COBBLE TOOLS

Site	Unit	Depth (cm)	Item[a]	L (mm)	W (mm)	T (mm)	Weight (g)
SCRI-845	15E, 27N	015-020	SECT	78.48	54.93	20.00	88.96
SCRI-845	15E, 27N	025-030	CECT	52.25	41.92	12.28	25.34
SCRI-845	15E, 27N	025-030	SECT	77.84	67.03	7.89	53.36
SCRI-845	15E, 27N	035-040	CECT	50.18	48.21	13.29	27.96
SCRI-845	15E, 27N	035-040	SECT	39.49	46.90	7.12	24.51
SCRI-845	15E, 27N	035-040	SECT	68.52	43.41	19.62	68.88
SCRI-845	15E, 27N	035-040	SET	58.61	41.07	5.90	25.76
SCRI-845	15E, 27N	040-045	CET	46.98	41.79	8.29	17.32
SCRI-845	15E, 27N	045-050	CECT	36.18	33.09	9.47	9.76
SCRI-845	15E, 27N	045-050	CECT	36.58	53.40	9.29	19.24
SCRI-845	15E, 27N	045-050	CECT	38.72	39.66	9.21	18.47
SCRI-845	15E, 27N	045-050	CECT	42.09	30.98	7.39	12.00
SCRI-845	15E, 27N	045-050	SECT	47.18	51.20	16.71	49.16
SCRI-845	15E, 27N	055-060	CECT	36.28	47.69	7.84	12.69
SCRI-845	15E, 27N	055-060	CECT	56.89	35.72	11.59	28.86
SCRI-845	15E, 27N	070-075	CECT	48.19	39.39	15.70	34.06
SCRI-845	15E, 27N	070-075	CECT	74.77	54.62	31.35	157.01
SCRI-845	15E, 27N	070-075	CET	52.58	26.94	18.92	31.54
SCRI-845	18E, 18N	005-010	CECT	39.09	30.71	13.69	13.13
SCRI-845	18E, 18N	010-015	CECT	59.47	25.80	11.77	19.17
SCRI-845	18E, 18N	010-015	CECT	82.01	65.41	41.78	255.27
SCRI-845	18E, 18N	010-015	SECT	57.48	41.42	21.86	38.42
SCRI-845	18E, 18N	010-015	SET	64.43	44.81	32.49	88.29
SCRI-845	18E, 18N	020-025	CET	39.50	31.01	10.79	14.22
SCRI-845	18E, 18N	020-025	SET	66.49	25.71	11.30	17.61
SCRI-845	18E, 18N	035-040	CECT	132.09	94.48	51.30	930.90
SCRI-845	18E, 19N	010-015	CECT	75.46	60.39	28.42	100.12
SCRI-845	18E, 19N	015-020	CECT	57.30	39.09	13.50	32.61
SCRI-845	18E, 19N	015-020	SECT	78.09	57.02	35.91	93.03
SCRI-849	13E, 20N	045-050	SET	63.51	33.49	16.88	31.64
SCRI-849	13E, 20N	080-085	CET	69.68	38.84	13.49	31.80
SCRI-849	13E, 20N	095-100	SET	73.18	64.80	21.68	111.68
SCRI-849	13E, 20N	115-120	SECT	67.19	54.98	30.29	100.29
SCRI-849	14E, 20N	015-020	SECT	74.32	49.50	17.23	49.49
SCRI-849	14E, 20N	075-080	SECT	91.62	61.58	40.11	271.00

. [a] Item descriptions provided in Ch. 3, drawn from Sunell 2013

TABLE 18

BIFACES[a]

Site	Unit	Depth (cm)	Material	Item	Count	Weight (g)
SCRI-851	1 (Auger)	000-025	SCRI Chert	Leaf-shaped point	1	0.43
SCRI-845	15E, 27N	035-040	SCRI Chert	Leaf-shaped point	1	1.39
SCRI-845	15E, 27N	050-055	Igneous	Biface (preform)	1	5.09
SCRI-845	15E, 27N	055-060	SCRI Chert	Leaf-shaped point	1	2.86
SCRI-845	15E, 27N	060-065	SCRI Chert	Biface (frag.)	2	0.89
SCRI-845	18E, 18N	005-010	SCRI Chert	Biface (frag.)	1	0.41
SCRI-845	18E, 18N	025-030	Fused Shale	Leaf-shaped point	1	0.19
SCRI-845	18E, 19N	010-015	SCRI Chert	Contracting stem point	1	6.65
SCRI-845	18E, 19N	015-020	SCRI Chert	Biface (frag)	1	0.51
SCRI-845	18E, 19N	015-020	SCRI Chert	Biface (preform)	1	0.30
SCRI-845	18E, 19N	015-020	SCRI Chert	Leaf-shaped point	1	0.71
SCRI-849	13E, 20N	040-045	Quartzite	Biface (frag.)	1	23.87[b]
SCRI-849	13E, 20N	075-080	SCRI Chert	Leaf-shaped point	1	1.84
SCRI-849	13E, 20N	095-100	SCRI Chert	Leaf-shaped point (frag.)	1	0.04
SCRI-849	13E, 20N	125-130	SCRI Chert	Leaf-shaped point (frag.)	1	1.46
SCRI-849	14E, 20N	095-100	Igneous	Biface	1	174.95[c]
SCRI-849	Slope[d]	Surface	Igneous	Biface	1	11.41

[a] All bifaces recorded in this table (except as noted below) are indeterminate except where noted or described.
[b] This large, bifacially worked flake fragment does not appear to have been a fragment of a formal tool and was apparently expediently retouched for use rather than formed specifically with the intent of producing a biface.
[c] This very large, early-stage biface is unique in the assemblage, both in size and form.
[d] See description of SCRI-849 in Appendix B for a detailed explanation of this context.

TABLE 19

DESCRIPTION OF FLAKES/DEBITAGE CATEGORIES IN THIS ANALYSIS

Artifact	Description
Debitage	Broken flakes and angular shatter, missing one or more features of complete flakes (i.e. no bulb/platform, no termination, no complete margins)
Flake	Any complete flake with termination, platform/bulb, and margins present; no constraint on dorsal cortex, maximum of 1 dorsal flake scar; no evidence of retouch or utilization
Flake (biface-thinning)	Any complete flake that includes 2+ dorsal flake scars, generally showing orientation along the same axis; margins lack evidence for retouch or utilization but platforms or terminations can possess signs of utilization associated with the tool from which the flake was removed (Frison 1968); no constraints on cortical material present
Flake (core rejuvenation)	Any complete flake that would otherwise be considered a biface-thinning flake but where flake scars are oriented along multiple axes
Flake (retouched)	Any complete flake with edge damage associated with retouch or utilization, no constraints on the presence of cortical material or dorsal flake scars; may share features with any other flake category
Blade	Any complete flake with parallel sides and a 2:1 length-width ratio; generally geometric in cross-section (primarily triangular, though some trapezoidal); flake terminations vary widely by material type and blade size

TABLE 20

COMPARISON OF MIDDLE AND TRANSITIONAL PERIOD DEBITAGE/FLAKES

				Chert		Igneous	
Site	Unit	Depth (cm)	Assemblage[a]	Count	Weight (g)	Count	Weight (g)
SCRI-845	15E, 27N	010-020	M	7	2.89	18	77.18
SCRI-845	15E, 27N	030-035	M	30	5.23	42	154.76
SCRI-845	15E, 27N	035-040	M	32	5.25	91	120.58
SCRI-845	15E, 27N	040-045	M	23	14.49	70	44.00
SCRI-845	15E, 27N	045-050	M	31	9.17	82	123.72
SCRI-845	15E, 27N	050-055	M	40	11.61	73	164.89
SCRI-845	15E, 27N	055-060	M	23	10.47	74	277.48
SCRI-845	15E, 27N	060-065	M	16	1.49	38	67.65
SCRI-845	18E, 18N	005-010	M	12	2.20	26	21.46
SCRI-845	18E, 18N	020-025[b]	M	45	66.65	48	102.64
SCRI-845	18E, 18N	025-030	M	68	51.73	75	79.17
SCRI-845	18E, 19N	015-020	M	52	10.56	32	54.89
SCRI-849	13E, 20N	075-080	T/L[c]	4	3.51	2	9.44
SCRI-849	13E, 20N	085-093	T	18	10.66	19	77.27
SCRI-849	13E, 20N	105-110	L-M	7	0.76	47	111.70
SCRI-849	13E, 20N	115-120	L-M	7	1.76	27	64.57

[a] M=Middle, L-M=late Middle, T=Transitional, L=Late
[b] In-situ reduction episode discussed above, all data for individual flakes is displayed in Tables 22 and 23.
[c] Assemblage from this depth is mixed, but is representative of total debitage/flake counts from post-Transitional contexts

TABLE 21

Description of Microblade/Microdrill categories in this analysis	
Artifact	Description
Microblade	Any blade (flakes with a 2:1 length:width ratio) characterized by properties associated with detritus from the specialized microdrill industry; divided into undiagnostic, Middle, and Late subtypes (see Arnold 2001a for subtype descriptions)
Microdrill	Any microblade with evidence of retouch (bit creation) or utilization at the distal tip; divided into triangular (undiagnostic), trapezoidal, and triangular with dorsal retouch (TDR) subtypes (see Arnold 2001a for subtype descriptions)

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
010-015[a]	Chert (SCRI)	Debitage (heat treated)	16.38	12.10	9.89	1.54
010-015	Chert (SCRI)	Debitage (heat treated)	17.51	8.12	7.58	0.68
010-015	Chert (Monterey)	Flake	9.72	9.32	0.99	0.13
010-015	Chert (SCRI)	Debitage	6.19	5.40	0.89	0.02
010-015	Igneous	Debitage	30.68	17.30	7.01	3.55
010-015	Igneous	Debitage	13.62	5.82	3.39	0.28
010-015	Igneous	Debitage	11.19	5.80	4.00	0.23
010-015	Igneous	Debitage	11.51	6.77	4.00	0.17
010-015	Igneous	Debitage	8.85	4.12	2.52	0.06
010-015	Igneous	Debitage	8.00	6.00	1.56	0.07
010-015	Igneous	Debitage	6.30	5.50	1.24	0.04
010-015	Igneous	Flake	21.52	21.64	3.29	2.26
010-015	Igneous	Flake	13.81	16.48	1.90	0.64
010-015	Igneous	Flake	12.19	21.92	4.94	1.09
010-015	Igneous	Flake	25.17	14.91	3.41	1.34
010-015	Igneous	Flake	17.51	13.10	2.76	0.62
010-015	Igneous	Flake	11.00	13.00	1.89	0.26
015-020	Igneous	Flake	23.43	10.68	5.80	1.33
015-020	Chert (SCRI)	Debitage (heat treated)	23.81	15.48	7.50	1.97
015-020	Chert (SCRI)	Debitage (heat treated)	13.14	6.23	3.81	0.36
015-020	Igneous	Debitage (heat treated)	18.49	15.49	6.63	1.68
015-020	Igneous	Debitage (heat treated)	16.38	11.42	4.88	0.64
020-025	Igneous	Flake	26.69	29.43	4.89	3.67
020-025	Igneous	Flake	23.68	14.53	3.82	1.20
020-025	Igneous	Flake	24.51	21.23	2.02	1.54
020-025	Igneous	Flake	18.82	23.79	1.90	1.06
020-025	Igneous	Flake	14.66	19.68	2.34	0.84
020-025	Chert (SCRI)	Flake	21.93	22.71	3.62	3.72
020-025	Igneous	Flake (heat treated)	40.57	28.77	5.39	5.91
020-025	Igneous	Flake (retouched)	36.32	30.88	9.33	4.90
020-025	Igneous	Debitage	27.92	15.17	5.32	1.56
025-030	Igneous	Debitage	24.14	12.88	6.71	2.00
025-030	Igneous	Debitage	23.99	12.23	5.90	1.46
025-030	Igneous	Debitage	24.02	9.79	4.17	0.64
025-030	Igneous	Debitage	59.92	32.09	13.94	16.25
025-030	Igneous	Debitage	27.72	21.41	5.71	2.15
025-030	Igneous	Debitage	23.01	15.08	6.19	1.49
025-030	Igneous	Debitage	24.90	13.31	7.90	1.76
025-030	Igneous	Debitage	22.00	10.00	4.18	0.84

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
025-030	Igneous	Debitage	22.48	13.33	3.83	1.25
025-030	Igneous	Debitage	17.11	13.73	7.62	1.39
025-030	Chert (SCRI)	Flake (heat treated)	31.26	22.92	6.87	5.32
025-030	Chert (SCRI)	Flake (heat treated)	9.72	13.81	1.93	0.47
025-030	Chert (Monterey)	Flake	14.89	15.50	3.38	0.84
025-030	Igneous	Flake	28.30	29.42	6.09	4.84
025-030	Igneous	Flake	18.18	15.49	4.70	1.14
025-030	Igneous	Flake	26.78	38.09	13.18	11.84
025-030	Igneous	Flake	38.48	36.02	10.64	12.72
025-030	Igneous	Flake	20.39	22.92	3.50	1.51
025-030	Igneous	Flake	21.68	24.60	2.02	1.43
025-030	Chert (SCRI)	Flake	33.38	28.99	5.38	6.42
025-030	Chert (SCRI)	Debitage (heat treated)	15.21	8.86	6.40	0.64
025-030	Igneous	Debitage (heat treated)	35.74	13.81	4.98	2.56
030-035	Chert (SCRI)	Flake	21.06	20.35	3.99	2.05
030-035	Chert (SCRI)	Flake	10.29	9.39	2.18	0.22
030-035	Chert (SCRI)	Flake	23.28	16.01	6.35	1.53
030-035	Chert (SCRI)	Flake	10.38	7.51	0.57	0.09
030-035	Chert (SCRI)	Flake	5.10	3.24	0.51	0.03
030-035	Chert (SCRI)	Debitage	12.50	6.22	1.90	0.15
030-035	Chert (SCRI)	Debitage	8.00	7.00	1.80	0.04
030-035	Chert (SCRI)	Debitage	6.49	4.59	1.69	0.06
030-035	Chert (SCRI)	Debitage	5.22	3.82	3.31	0.03
030-035	Chert (SCRI)	Debitage	7.11	5.33	1.70	0.04
030-035	Chert (SCRI)	Debitage	4.81	5.13	1.77	0.03
030-035	Chert (SCRI)	Debitage	5.99	4.29	1.39	0.02
030-035	Chert (SCRI)	Debitage	6.45	6.09	1.49	0.05
030-035	Chert (SCRI)	Debitage	5.50	4.32	1.12	0.00
030-035	Chert (SCRI)	Debitage	5.49	5.41	0.89	0.02
030-035	Chert (SCRI)	Debitage	5.83	3.59	0.91	0.00
030-035	Chert (SCRI)	Debitage	6.03	3.39	0.91	0.02
030-035	Igneous	Flake	40.12	28.27	9.89	12.25
030-035	Igneous	Flake	39.91	21.49	10.70	8.24
030-035	Igneous	Flake	32.29	20.51	4.21	2.98
030-035	Igneous	Flake	17.99	15.69	1.66	0.80
030-035	Igneous	Flake	10.22	21.20	1.23	0.64
030-035	Igneous	Flake	44.21	37.13	6.70	15.48
030-035	Igneous	Flake	23.59	29.65	5.56	4.15
030-035	Igneous	Flake	14.22	26.71	3.01	2.46

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
030-035	Igneous	Flake	19.70	16.75	5.89	2.41
030-035	Igneous	Flake	15.09	15.44	2.10	0.75
030-035	Igneous	Flake	20.49	18.09	4.12	1.14
030-035	Igneous	Flake	16.47	16.99	2.59	0.72
030-035	Igneous	Flake	13.89	14.13	1.30	0.61
030-035	Igneous	Flake	16.62	10.56	2.11	0.62
030-035	Igneous	Flake	10.91	8.98	2.30	0.25
030-035	Chert (SCRI)	Debitage (heat treated)	16.80	6.00	4.47	0.34
030-035	Chert (SCRI)	Debitage (heat treated)	5.12	4.60	1.10	0.04
030-035	Igneous	Debitage	30.19	21.02	5.40	2.76
030-035	Igneous	Debitage	19.10	17.68	2.56	0.86
030-035	Igneous	Debitage	22.00	11.75	5.20	1.06
030-035	Igneous	Debitage	10.40	10.59	6.09	0.75
030-035	Igneous	Debitage	11.89	7.31	2.09	0.15
030-035	Igneous	Debitage	36.68	19.91	9.90	5.95
030-035	Igneous	Debitage	31.41	24.91	25.69	4.86
030-035	Igneous	Debitage	14.21	12.28	7.20	0.84
030-035	Igneous	Debitage	14.37	8.49	3.10	0.34
030-035	Igneous	Debitage	15.28	8.50	3.60	0.44
030-035	Igneous	Debitage	13.18	7.51	1.80	0.16
030-035	Igneous	Debitage	11.91	6.15	3.41	0.16
030-035	Igneous	Debitage	10.65	7.51	2.44	0.15
030-035	Igneous	Debitage	9.60	5.42	2.16	0.10
030-035	Igneous	Debitage	7.68	6.51	1.29	0.06
030-035	Igneous	Debitage	7.18	5.52	1.90	0.08
030-035	Igneous	Debitage	8.41	4.89	0.97	0.03
030-035	Chert (other exotic)	Flake	6.51	5.43	1.00	0.04
030-035	Chert (SCRI)	Flake (heat treated)	11.38	11.58	2.61	0.48
030-035	Chert (SCRI)	Flake (heat treated)	11.51	8.50	1.71	0.37
030-035	Chert (SCRI)	Flake (heat treated)	4.80	11.69	1.86	0.17
030-035	Chert (SCRI)	Flake (heat treated)	8.22	9.26	1.02	11.00
030-035	Igneous	Flake (retouched)	18.49	14.10	4.20	0.99
030-035	Igneous	Flake (retouched)	12.72	9.99	1.70	0.17
030-035	Igneous	Flake (retouched)	15.01	9.20	2.40	0.23
035-040	Igneous	Flake	18.49	33.61	3.59	5.03
035-040	Igneous	Flake	22.51	30.69	3.71	2.88
035-040	Igneous	Flake	13.99	27.99	1.58	1.14
035-040	Igneous	Flake	19.82	18.21	1.95	0.87

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
035-040	Igneous	Flake	14.99	10.89	2.81	0.62
035-040	Igneous	Flake	13.07	12.17	0.50	0.34
035-040	Igneous	Flake	10.39	11.13	3.12	0.27
035-040	Igneous	Flake	36.88	29.50	8.39	9.07
035-040	Igneous	Flake	31.03	22.48	7.32	4.50
035-040	Igneous	Flake	23.31	30.69	3.75	2.71
035-040	Igneous	Flake	22.91	26.00	6.01	3.97
035-040	Igneous	Flake	26.45	20.33	3.78	2.75
035-040	Igneous	Flake	19.29	28.16	1.02	1.74
035-040	Igneous	Flake	18.28	11.38	2.68	0.66
035-040	Igneous	Flake	16.81	26.91	1.44	1.47
035-040	Igneous	Flake	20.09	17.90	4.81	1.77
035-040	Igneous	Flake	19.24	22.99	7.98	2.62
035-040	Igneous	Flake	21.79	13.44	5.05	1.32
035-040	Igneous	Flake	16.90	12.99	2.76	0.74
035-040	Igneous	Flake	17.92	13.11	1.60	0.75
035-040	Igneous	Flake	9.98	13.81	1.51	0.34
035-040	Igneous	Flake	9.35	13.62	2.62	0.52
035-040	Igneous	Flake	12.91	8.99	1.42	0.26
035-040	Igneous	Flake	11.61	13.38	1.50	0.32
035-040	Igneous	Flake	9.60	8.08	1.60	0.21
035-040	Igneous	Flake	9.62	6.79	0.97	0.12
035-040	Igneous	Flake	8.02	9.39	1.20	0.14
035-040	Igneous	Flake	6.60	8.20	0.80	0.13
035-040	Igneous	Flake	7.89	5.97	1.40	0.10
035-040	Igneous	Flake	8.51	5.82	0.87	0.07
035-040	Chert (SCRI)	Flake (heat treated)	51.70	26.23	6.52	11.05
035-040	Chert (SCRI)	Flake (heat treated)	25.31	21.89	4.18	2.47
035-040	Chert (SCRI)	Flake (heat treated)	24.21	13.79	1.90	0.87
035-040	Chert (SCRI)	Flake (heat treated)	16.49	12.61	2.33	0.68
035-040	Chert (SCRI)	Flake (heat treated)	14.28	9.52	1.98	0.37
035-040	Chert (SCRI)	Flake (heat treated)	15.81	14.51	1.60	0.43
035-040	Chert (SCRI)	Flake (heat treated)	7.04	3.70	0.90	0.04
035-040	Chert (Monterey)	Flake (heat treated)	29.35	29.11	9.91	4.02
035-040	Chert (Monterey)	Flake (heat treated)	15.29	13.19	1.78	0.46
035-040	Chert (Monterey)	Flake (heat treated)	30.31	20.22	3.29	2.66
035-040	Chert (Monterey)	Flake (heat treated)	9.31	13.10	1.90	0.24
035-040	Chert (SCRI)	Flake	16.11	10.50	1.80	0.50
035-040	Chert (SCRI)	Flake	11.02	15.58	1.28	0.16

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
035-040	Igneous	Debitage	46.31	30.21	16.49	13.47
035-040	Igneous	Debitage	32.02	23.62	9.79	5.10
035-040	Igneous	Debitage	24.00	16.22	6.46	3.08
035-040	Igneous	Debitage	22.70	17.91	7.42	3.16
035-040	Igneous	Debitage	32.34	20.58	6.09	3.66
035-040	Igneous	Debitage	22.90	13.32	8.39	1.84
035-040	Igneous	Debitage	19.81	15.37	4.39	0.90
035-040	Igneous	Debitage	17.39	12.29	4.30	0.91
035-040	Igneous	Debitage	16.59	10.71	6.10	0.93
035-040	Igneous	Debitage	19.22	11.65	9.10	1.55
035-040	Igneous	Debitage	12.00	7.39	5.28	0.43
035-040	Igneous	Debitage	13.41	9.12	1.89	0.32
035-040	Igneous	Debitage	24.04	16.69	8.91	2.25
035-040	Igneous	Debitage	21.65	10.90	6.09	0.89
035-040	Igneous	Debitage	22.09	10.40	2.48	0.88
035-040	Igneous	Debitage	12.80	15.41	3.50	0.67
035-040	Igneous	Debitage	12.84	9.56	3.07	0.33
035-040	Igneous	Debitage	17.97	9.34	6.42	0.83
035-040	Igneous	Debitage	13.51	9.79	5.81	0.65
035-040	Igneous	Debitage	17.62	8.31	7.66	0.68
035-040	Igneous	Debitage	13.54	8.71	3.28	0.27
035-040	Igneous	Debitage	12.60	6.33	5.70	0.43
035-040	Igneous	Debitage	10.09	8.69	5.32	0.41
035-040	Igneous	Debitage	15.32	9.38	4.80	0.38
035-040	Igneous	Debitage	13.99	7.50	3.81	0.28
035-040	Igneous	Debitage	8.52	7.90	2.75	0.19
035-040	Igneous	Debitage	11.78	9.43	4.70	0.38
035-040	Igneous	Debitage	9.04	7.30	2.92	0.19
035-040	Igneous	Debitage	11.18	6.10	1.90	0.18
035-040	Igneous	Debitage	8.30	7.84	4.22	0.18
035-040	Igneous	Debitage	11.39	6.20	3.72	0.22
035-040	Igneous	Debitage	13.83	6.85	2.89	0.16
035-040	Igneous	Debitage	10.72	5.68	3.18	0.13
035-040	Igneous	Debitage	10.49	8.30	3.90	0.22
035-040	Igneous	Debitage	8.71	4.82	3.20	0.15
035-040	Igneous	Debitage	11.12	10.69	3.72	0.32
035-040	Igneous	Debitage	8.60	6.91	1.32	0.08
035-040	Igneous	Debitage	10.00	9.09	2.91	0.21
035-040	Igneous	Debitage	9.40	7.76	2.70	0.19

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
035-040	Igneous	Debitage	10.91	10.99	3.85	0.38
035-040	Igneous	Debitage	8.69	6.52	3.19	0.14
035-040	Igneous	Debitage	8.80	6.50	2.81	0.10
035-040	Igneous	Debitage	8.09	7.71	3.51	0.14
035-040	Igneous	Debitage	10.86	7.79	2.48	0.20
035-040	Igneous	Debitage	9.08	6.01	3.25	0.15
035-040	Igneous	Debitage	10.00	8.16	3.20	0.17
035-040	Igneous	Debitage	9.56	5.34	3.32	0.09
035-040	Igneous	Debitage	7.51	4.89	2.71	0.08
035-040	Igneous	Debitage	7.10	5.13	5.33	0.13
035-040	Igneous	Flake (retouched)	32.51	25.61	5.20	5.18
035-040	Igneous	Flake (retouched)	44.89	18.89	8.65	7.25
035-040	Igneous	Flake (retouched)	33.28	18.70	5.21	3.22
035-040	Chert (Monterey)	Flake (retouched)	14.50	13.49	7.00	0.88
035-040	Chert (Monterey)	Flake	14.50	9.69	3.21	0.58
035-040	Chert (Monterey)	Flake	14.97	11.14	1.21	0.41
035-040	Chert (SCRI)	Debitage	9.31	5.34	2.85	0.13
035-040	Chert (SCRI)	Debitage	8.40	3.79	3.31	0.10
035-040	Chert (SCRI)	Debitage	9.02	6.33	1.18	0.05
035-040	Chert (SCRI)	Debitage	7.41	6.01	1.42	0.05
035-040	Chert (SCRI)	Debitage	6.21	4.01	1.41	0.03
035-040	Chert (SCRI)	Debitage	7.48	2.02	0.40	0.01
035-040	Chert (SCRI)	Debitage (heat treated)	18.49	13.01	6.85	1.10
035-040	Chert (SCRI)	Debitage (heat treated)	11.19	10.40	6.59	0.49
035-040	Chert (SCRI)	Debitage (heat treated)	11.19	3.59	3.58	0.16
035-040	Chert (SCRI)	Debitage (heat treated)	9.90	7.39	5.09	0.19
035-040	Chert (SCRI)	Debitage (heat treated)	8.82	3.91	2.80	0.05
035-040	Chert (SCRI)	Debitage (heat treated)	8.50	4.11	2.89	0.10
035-040	Chert (SCRI)	Debitage (heat treated)	6.09	5.01	1.79	0.05
035-040	Chert (SCRI)	Debitage (heat treated)	6.50	4.81	2.12	0.06
035-040	Chert (SCRI)	Debitage (heat treated)	6.15	5.10	3.21	0.06
035-040	Igneous	Debitage (heat treated)	21.36	23.01	8.52	2.81
040-045	Igneous	Flake	19.40	28.41	2.99	2.21
040-045	Igneous	Flake	15.87	16.87	3.21	1.12
040-045	Igneous	Flake	12.31	17.59	2.81	1.04
040-045	Igneous	Flake	9.29	25.15	1.82	0.95
040-045	Igneous	Flake	12.00	13.91	2.48	0.54
040-045	Igneous	Flake	19.09	28.72	2.39	2.47
040-045	Igneous	Flake	27.32	20.80	2.99	1.74

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
040-045	Igneous	Flake	18.64	21.01	5.03	2.46
040-045	Igneous	Flake	21.89	21.01	4.80	1.91
040-045	Igneous	Flake	10.51	11.50	0.90	0.23
040-045	Igneous	Flake	10.53	13.32	2.23	0.46
040-045	Igneous	Flake	12.61	7.43	1.50	0.21
040-045	Igneous	Flake	6.62	1.41	1.39	0.18
040-045	Chert (SCRI)	Debitage (heat treated)	5.41	5.41	1.38	0.05
040-045	Chert (SCRI)	Debitage (heat treated)	5.60	4.68	2.30	0.13
040-045	Chert (SCRI)	Debitage	10.98	6.52	1.53	0.13
040-045	Chert (SCRI)	Debitage	6.49	5.82	2.41	0.09
040-045	Chert (SCRI)	Debitage	6.73	5.32	0.28	0.05
040-045	Chert (SCRI)	Debitage	9.77	3.11	2.21	0.05
040-045	Chert (SCRI)	Debitage	8.20	4.62	1.48	0.03
040-045	Chert (SCRI)	Debitage	5.49	5.51	2.10	0.06
040-045	Chert (SCRI)	Debitage	6.73	5.71	1.61	0.05
040-045	Chert (SCRI)	Debitage	6.34	4.70	0.62	0.03
040-045	Chert (SCRI)	Debitage	5.23	4.01	2.63	0.04
040-045	Chert (SCRI)	Debitage	15.12	9.82	3.85	0.47
040-045	Chert (Monterey)	Flake	10.02	13.59	2.14	0.26
040-045	Chert (Monterey)	Flake	6.93	5.81	0.50	0.05
040-045	Chert (SCRI)	Flake (heat treated)	17.28	10.62	2.21	0.58
040-045	Chert (SCRI)	Flake (heat treated)	11.20	9.72	1.89	0.28
040-045	Igneous	Flake (retouched)	54.69	42.81	13.21	25.44
040-045	Igneous	Flake (retouched)	14.01	18.86	1.30	0.57
040-045	Igneous	Flake (retouched)	44.97	37.98	8.59	16.09
040-045	Igneous	Flake (retouched)	31.89	20.19	5.23	3.57
040-045	Igneous	Debitage	28.13	17.63	8.12	3.91
040-045	Igneous	Debitage	20.67	19.89	3.24	1.47
040-045	Igneous	Debitage	21.28	16.82	5.42	1.22
040-045	Igneous	Debitage	21.98	17.39	5.50	1.45
040-045	Igneous	Debitage	15.79	14.27	3.62	0.78
040-045	Igneous	Debitage	19.49	7.69	4.72	0.64
040-045	Igneous	Debitage	17.12	12.68	6.00	0.85
040-045	Igneous	Debitage	11.71	11.37	4.99	0.44
040-045	Igneous	Debitage	12.44	9.89	2.68	0.39
040-045	Igneous	Debitage	13.67	7.15	5.90	0.40
040-045	Igneous	Debitage	15.28	8.30	1.58	0.23
040-045	Igneous	Debitage	10.50	8.69	4.10	0.30
040-045	Igneous	Debitage	18.30	11.54	5.11	0.72

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
040-045	Igneous	Debitage	17.28	17.39	4.89	1.06
040-045	Igneous	Debitage	16.73	11.79	4.89	0.86
040-045	Igneous	Debitage	14.01	12.09	3.41	0.37
040-045	Igneous	Debitage	14.19	10.51	5.32	0.76
040-045	Igneous	Debitage	10.49	7.41	6.21	0.30
040-045	Igneous	Debitage	12.24	11.16	2.01	0.30
040-045	Igneous	Debitage	11.15	12.82	4.09	0.38
040-045	Igneous	Debitage	16.80	12.61	3.52	0.57
040-045	Igneous	Debitage	12.49	11.09	2.32	0.31
040-045	Igneous	Debitage	10.92	10.79	3.30	0.47
040-045	Igneous	Debitage	14.25	9.01	3.01	0.24
040-045	Igneous	Debitage	11.03	8.60	4.08	0.28
040-045	Igneous	Debitage	10.99	12.51	1.89	0.29
040-045	Igneous	Debitage	11.20	7.74	2.22	0.15
040-045	Igneous	Debitage	13.91	7.28	4.11	0.26
040-045	Igneous	Debitage	10.80	7.59	10.50	0.27
040-045	Igneous	Debitage	7.82	5.94	1.70	0.06
040-045	Igneous	Debitage	9.11	9.42	1.00	0.10
040-045	Igneous	Debitage	10.79	9.48	3.01	0.21
040-045	Igneous	Debitage	7.59	7.43	4.33	0.21
040-045	Igneous	Debitage	8.22	6.29	4.00	0.12
040-045	Igneous	Debitage	6.81	7.38	2.10	0.09
040-045	Igneous	Debitage	7.20	6.40	2.28	0.12
040-045	Igneous	Debitage	10.49	5.32	2.39	0.14
040-045	Igneous	Debitage	6.73	4.22	2.87	0.06
040-045	Igneous	Debitage	5.90	5.54	2.81	0.07
040-045	Igneous	Debitage	6.66	6.49	1.07	0.05
040-045	Igneous	Debitage	8.01	7.09	1.75	0.08
040-045	Igneous	Debitage	8.00	3.80	1.60	0.04
040-045	Igneous	Debitage	7.11	4.12	3.00	0.06
040-045	Igneous	Debitage	7.20	6.38	1.53	0.06
040-045	Igneous	Debitage	6.71	4.70	1.80	0.03
040-045	Igneous	Debitage	4.02	3.73	2.50	0.04
040-045	Igneous	Debitage	6.19	3.24	1.79	0.04
040-045	Igneous	Debitage	5.62	4.98	2.20	0.04
040-045	Igneous	Debitage	6.91	2.89	2.26	0.00
040-045	Igneous	Debitage	5.90	3.89	1.68	0.04
040-045	Igneous	Debitage	4.22	3.50	1.62	0.02
040-045	Igneous	Flake (heat treated)	23.40	23.75	3.29	2.69

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
045-050	Igneous	Flake	24.62	25.78	3.83	2.50
045-050	Igneous	Flake	13.84	18.53	2.61	0.80
045-050	Igneous	Flake	13.59	11.58	2.70	0.61
045-050	Igneous	Flake	12.70	10.34	1.90	0.35
045-050	Igneous	Flake	31.10	31.19	4.39	6.54
045-050	Igneous	Flake	19.29	19.08	3.34	1.31
045-050	Igneous	Flake	14.91	16.01	1.91	0.66
045-050	Igneous	Flake	14.49	16.69	2.49	0.93
045-050	Igneous	Flake	11.98	14.92	1.80	0.29
045-050	Igneous	Flake	14.61	9.32	3.89	0.43
045-050	Igneous	Flake	9.41	10.70	1.09	0.17
045-050	Igneous	Flake (heat treated)	17.63	13.19	4.12	0.59
045-050	Igneous	Flake (heat treated)	11.70	12.99	6.23	0.69
045-050	Igneous	Flake (heat treated)	15.02	9.60	4.38	0.46
045-050	Igneous	Flake (heat treated)	19.98	22.40	3.52	1.61
045-050	Igneous	Flake (retouched)	48.84	38.31	9.38	14.84
045-050	Igneous	Flake (retouched)	31.20	30.92	5.37	4.10
045-050	Igneous	Flake (retouched)	15.83	32.81	4.31	3.61
045-050	Igneous	Flake (retouched)	15.12	23.30	5.11	2.04
045-050	Igneous	Flake (retouched)	12.72	18.39	3.49	0.93
045-050	Igneous	Flake (retouched)	8.32	18.01	2.80	0.63
045-050	Igneous	Flake (retouched)	18.61	12.99	1.89	0.60
045-050	Igneous	Flake (retouched)	7.52	13.78	1.79	0.27
045-050	Chert (SCRI)	Flake (heat treated)	13.99	32.30	7.25	2.43
045-050	Chert (SCRI)	Flake (heat treated)	19.10	26.39	1.79	1.17
045-050	Chert (SCRI)	Flake (heat treated)	14.69	7.14	2.51	0.26
045-050	Chert (SCRI)	Debitage (heat treated)	19.70	12.86	3.68	0.89
045-050	Chert (SCRI)	Debitage (heat treated)	23.10	17.92	4.59	1.73
045-050	Chert (SCRI)	Debitage (heat treated)	9.48	6.09	3.30	0.14
045-050	Chert (SCRI)	Debitage (heat treated)	9.68	6.68	4.22	0.20
045-050	Chert (SCRI)	Debitage	16.79	13.77	2.65	0.47
045-050	Chert (SCRI)	Debitage	6.11	7.31	3.90	0.09
045-050	Chert (SCRI)	Debitage	14.12	9.02	1.99	0.19
045-050	Chert (SCRI)	Debitage	9.09	6.91	1.49	0.08
045-050	Chert (SCRI)	Debitage	7.92	5.26	2.17	0.08
045-050	Chert (SCRI)	Debitage	6.60	6.19	2.11	0.05
045-050	Chert (SCRI)	Debitage	6.22	3.81	0.68	0.02
045-050	Chert (SCRI)	Flake	14.84	15.25	2.39	0.96
045-050	Chert (SCRI)	Flake	16.79	12.76	2.01	0.53

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
045-050	Igneous	Debitage	39.90	28.82	14.11	11.72
045-050	Igneous	Debitage	35.42	26.80	13.50	7.69
045-050	Igneous	Debitage	23.90	18.80	7.61	3.67
045-050	Igneous	Debitage	31.51	19.01	6.85	3.36
045-050	Igneous	Debitage	24.59	14.27	5.21	1.21
045-050	Igneous	Debitage	22.91	16.84	6.89	2.34
045-050	Igneous	Debitage	17.03	11.32	5.18	0.86
045-050	Igneous	Debitage	18.49	11.39	5.69	1.03
045-050	Igneous	Debitage	17.99	13.49	3.02	0.82
045-050	Igneous	Debitage	12.62	13.23	2.51	0.36
045-050	Igneous	Debitage	11.99	13.90	5.81	0.69
045-050	Igneous	Debitage	14.58	12.29	3.28	0.66
045-050	Igneous	Debitage	13.78	11.58	5.05	0.73
045-050	Igneous	Debitage	13.30	9.43	4.29	0.38
045-050	Igneous	Debitage	11.70	12.00	4.29	0.42
045-050	Igneous	Debitage	14.79	8.52	3.00	0.29
045-050	Igneous	Debitage	51.72	25.70	7.72	8.36
045-050	Igneous	Debitage	35.27	29.21	13.22	7.66
045-050	Igneous	Debitage	35.71	17.03	5.31	4.47
045-050	Igneous	Debitage	25.21	20.80	4.73	2.66
045-050	Igneous	Debitage	20.29	20.10	4.81	1.81
045-050	Igneous	Debitage	17.09	9.59	4.80	0.39
045-050	Igneous	Debitage	16.22	9.19	2.09	0.28
045-050	Igneous	Debitage	13.39	9.00	2.00	0.28
045-050	Igneous	Debitage	11.80	11.48	3.31	0.41
045-050	Igneous	Debitage	12.70	11.41	3.98	0.37
045-050	Igneous	Debitage	13.72	7.01	2.48	0.17
045-050	Igneous	Debitage	12.29	7.32	3.79	0.28
045-050	Igneous	Debitage	12.81	10.51	3.11	0.35
045-050	Igneous	Debitage	12.35	7.15	1.79	0.11
045-050	Igneous	Debitage	10.41	5.80	1.89	0.08
045-050	Igneous	Debitage	9.92	4.89	2.32	0.09
045-050	Igneous	Debitage	11.92	8.50	3.19	0.24
045-050	Igneous	Debitage	11.69	6.68	4.76	0.24
045-050	Igneous	Debitage	11.07	9.21	2.31	0.25
045-050	Igneous	Debitage	10.94	7.18	1.43	0.12
045-050	Igneous	Debitage	12.62	8.01	3.10	0.26
045-050	Igneous	Debitage	11.31	5.62	2.79	0.22
045-050	Igneous	Debitage	7.88	7.51	1.80	0.13

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
045-050	Igneous	Debitage	8.48	6.53	3.12	0.17
045-050	Igneous	Debitage	11.18	4.79	3.39	0.14
045-050	Igneous	Debitage	9.22	7.20	4.25	0.23
045-050	Igneous	Debitage	11.58	8.84	4.00	0.26
045-050	Igneous	Debitage	9.70	7.28	2.03	0.14
045-050	Igneous	Debitage	9.48	8.22	1.99	0.14
045-050	Igneous	Debitage	7.81	8.59	3.27	0.19
045-050	Igneous	Debitage	9.20	8.70	2.70	0.12
045-050	Igneous	Debitage	10.12	4.52	4.09	0.16
045-050	Igneous	Debitage	9.19	6.19	2.89	0.15
045-050	Igneous	Debitage	9.81	7.32	2.11	0.12
045-050	Igneous	Debitage	8.38	4.51	2.28	0.06
045-050	Igneous	Debitage	8.11	2.59	2.59	0.05
045-050	Igneous	Debitage	9.75	6.45	1.24	0.06
045-050	Igneous	Debitage	8.58	3.60	2.69	0.03
045-050	Igneous	Debitage	10.52	5.51	1.09	0.05
045-050	Igneous	Debitage	7.71	4.69	2.58	0.09
045-050	Igneous	Debitage	9.80	4.15	1.91	0.08
045-050	Igneous	Debitage	7.42	4.09	2.21	0.05
045-050	Igneous	Debitage	8.81	7.22	0.99	0.04
045-050	Igneous	Debitage	7.19	5.03	1.10	0.03
045-050	Igneous	Debitage	7.15	4.11	1.89	0.03
045-050	Igneous	Debitage	8.38	3.22	1.30	0.02
045-050	Igneous	Debitage	6.62	2.21	1.59	0.03
045-050	Igneous	Debitage	4.60	3.40	1.91	0.03
045-050	Igneous	Debitage	5.35	2.81	1.51	0.02
045-050	Igneous	Debitage	3.79	2.90	1.62	0.01
050-055	Chert (SCRI)	Debitage	18.44	10.72	5.31	0.49
050-055	Chert (SCRI)	Debitage	13.21	6.69	3.98	0.29
050-055	Chert (SCRI)	Debitage	11.09	6.15	4.41	0.16
050-055	Chert (SCRI)	Debitage	10.64	5.38	2.71	0.10
050-055	Chert (SCRI)	Debitage	9.40	6.09	2.01	0.09
050-055	Chert (SCRI)	Debitage	9.32	5.59	2.59	0.09
050-055	Chert (SCRI)	Debitage	8.42	4.91	1.93	0.07
050-055	Chert (SCRI)	Debitage	9.79	4.89	1.41	0.04
050-055	Igneous	Flake	23.49	13.37	2.89	1.01
050-055	Igneous	Flake	17.81	18.40	4.36	1.23
050-055	Igneous	Flake	7.80	9.88	2.39	0.17
050-055	Igneous	Flake	19.68	25.74	7.01	3.18

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
050-055	Igneous	Flake	22.28	20.39	1.62	1.06
050-055	Igneous	Flake	3.39	14.59	1.92	0.58
050-055	Igneous	Flake	10.98	18.09	1.30	0.44
050-055	Igneous	Flake	12.08	10.84	3.51	0.39
050-055	Igneous	Flake	9.81	10.76	2.12	0.31
050-055	Igneous	Flake	10.01	10.28	2.01	0.28
050-055	Igneous	Flake (retouched)	28.38	44.72	12.96	13.68
050-055	Igneous	Flake (retouched)	24.76	39.79	4.98	5.94
050-055	Igneous	Flake (retouched)	21.90	14.52	9.34	2.79
050-055	Igneous	Flake (retouched)	31.77	9.32	5.69	1.73
050-055	Igneous	Debitage	40.22	28.48	12.89	14.79
050-055	Igneous	Debitage	44.20	21.29	16.27	10.26
050-055	Igneous	Debitage	17.33	17.61	8.82	1.67
050-055	Igneous	Debitage	30.48	22.98	6.70	3.42
050-055	Igneous	Debitage	20.63	16.38	6.70	1.23
050-055	Igneous	Debitage	18.59	15.80	3.02	1.05
050-055	Igneous	Debitage	12.20	12.13	4.21	0.32
050-055	Igneous	Debitage	14.36	6.60	6.29	0.53
050-055	Igneous	Debitage	14.50	9.81	2.61	0.35
050-055	Igneous	Debitage	12.40	7.00	5.37	0.33
050-055	Igneous	Debitage	8.99	5.22	3.18	0.16
050-055	Igneous	Debitage	45.31	26.23	11.37	7.90
050-055	Igneous	Debitage	27.54	13.37	4.22	1.34
050-055	Igneous	Debitage	24.12	21.13	5.22	2.07
050-055	Igneous	Debitage	19.21	16.08	4.00	1.16
050-055	Igneous	Debitage	15.08	13.69	3.22	0.53
050-055	Igneous	Debitage	15.36	14.11	3.83	0.62
050-055	Igneous	Debitage	18.32	9.27	1.94	0.29
050-055	Igneous	Debitage	19.60	12.52	3.86	0.68
050-055	Igneous	Debitage	13.49	13.83	4.00	0.63
050-055	Igneous	Debitage	13.18	7.47	3.92	0.26
050-055	Igneous	Debitage	11.42	9.18	5.73	0.47
050-055	Igneous	Debitage	10.31	5.18	3.50	0.32
050-055	Igneous	Debitage	14.69	9.94	2.78	0.32
050-055	Igneous	Debitage	12.20	6.48	2.81	0.24
050-055	Igneous	Debitage	10.13	8.38	3.97	0.29
050-055	Igneous	Debitage	11.22	5.38	4.14	0.27
050-055	Igneous	Debitage	11.78	5.78	4.30	0.32
050-055	Igneous	Debitage	8.29	4.22	2.08	0.08

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
050-055	Igneous	Debitage	9.13	7.23	2.25	0.10
050-055	Igneous	Debitage	9.59	6.02	2.43	0.09
050-055	Igneous	Debitage	8.11	6.41	2.52	0.09
050-055	Igneous	Debitage	6.32	4.99	1.41	0.04
050-055	Chert (Monterey)	Debitage	15.43	7.08	5.10	0.40
050-055	Chert (Monterey)	Debitage	12.00	9.19	3.39	0.29
050-055	Chert (Monterey)	Debitage	5.67	4.85	3.12	0.05
050-055	Chert (SCRI)	Flake (retouched)	19.22	12.52	2.97	0.58
050-055	Chert (SCRI)	Flake (retouched)	30.00	25.38	6.48	6.06
055-060	Igneous	Flake	29.79	28.85	8.83	6.32
055-060	Igneous	Flake	26.48	28.68	3.27	3.53
055-060	Igneous	Flake	25.08	27.20	5.29	2.84
055-060	Igneous	Flake	7.40	27.70	3.68	2.44
055-060	Igneous	Flake	20.73	21.38	1.65	1.02
055-060	Igneous	Flake	18.07	11.48	3.82	0.88
055-060	Igneous	Flake	17.01	19.00	5.61	1.25
055-060	Igneous	Flake	17.33	14.42	3.58	1.17
055-060	Igneous	Flake	12.68	14.28	2.90	0.42
055-060	Igneous	Flake	51.33	53.05	8.10	21.13
055-060	Igneous	Flake	25.58	26.54	14.72	8.35
055-060	Igneous	Flake	22.82	34.54	9.88	7.39
055-060	Igneous	Flake	20.28	19.35	4.49	2.03
055-060	Igneous	Flake	16.70	24.02	5.98	2.51
055-060	Igneous	Flake	21.88	19.38	3.92	2.34
055-060	Igneous	Flake	19.68	10.32	4.80	1.01
055-060	Igneous	Flake	19.20	16.82	4.50	1.02
055-060	Igneous	Flake	19.62	14.83	3.63	1.04
055-060	Igneous	Flake	20.18	18.19	7.29	2.01
055-060	Igneous	Flake	19.12	19.28	3.68	1.11
055-060	Igneous	Flake	12.38	16.99	3.28	0.84
055-060	Igneous	Flake	15.62	15.60	2.25	0.69
055-060	Igneous	Flake	16.01	18.23	1.99	0.83
055-060	Igneous	Flake	12.51	10.48	3.59	0.41
055-060	Igneous	Flake	14.25	13.10	2.30	0.52
055-060	Igneous	Flake	14.68	10.19	2.27	0.31
055-060	Igneous	Flake	12.02	12.25	2.40	0.42
055-060	Chert (SCRI)	Flake	23.22	19.32	2.48	1.83
055-060	Chert (SCRI)	Flake	10.48	11.50	2.75	0.32
055-060	Igneous	Debitage	28.89	19.00	4.24	1.85

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
055-060	Igneous	Debitage	26.03	21.36	8.63	3.39
055-060	Igneous	Debitage	24.92	16.28	7.29	1.85
055-060	Igneous	Debitage	18.00	15.21	3.68	0.83
055-060	Igneous	Debitage	17.88	16.32	4.99	1.08
055-060	Igneous	Debitage	21.44	11.70	5.71	1.33
055-060	Igneous	Debitage	18.19	16.62	5.20	0.71
055-060	Igneous	Debitage	10.28	9.27	6.02	0.34
055-060	Igneous	Debitage	13.78	6.92	1.71	0.17
055-060	Igneous	Debitage	13.12	6.72	3.28	0.24
055-060	Igneous	Debitage	9.16	8.71	2.94	0.21
055-060	Igneous	Debitage	15.18	3.82	1.78	0.15
055-060	Igneous	Debitage	32.09	19.93	10.58	4.69
055-060	Igneous	Debitage	30.32	19.82	13.68	6.93
055-060	Igneous	Debitage	23.21	16.71	6.54	2.09
055-060	Igneous	Debitage	24.72	11.06	4.49	1.28
055-060	Igneous	Debitage	20.92	16.00	5.48	1.90
055-060	Igneous	Debitage	25.59	16.59	5.10	1.91
055-060	Igneous	Debitage	14.62	14.95	8.86	2.25
055-060	Igneous	Debitage	21.96	17.78	3.89	1.00
055-060	Igneous	Debitage	13.52	12.30	4.69	0.56
055-060	Igneous	Debitage	18.81	10.94	8.00	1.13
055-060	Igneous	Debitage	18.70	12.21	3.32	0.89
055-060	Igneous	Debitage	18.34	12.78	4.02	0.82
055-060	Igneous	Debitage	18.33	8.84	3.20	0.53
055-060	Igneous	Debitage	15.32	14.82	2.59	0.63
055-060	Igneous	Debitage	13.07	10.48	5.99	0.89
055-060	Igneous	Debitage	14.82	9.78	3.20	0.43
055-060	Igneous	Debitage	10.90	8.59	5.93	0.50
055-060	Igneous	Debitage	11.29	7.03	4.82	0.38
055-060	Igneous	Debitage	12.71	7.40	3.39	0.18
055-060	Igneous	Debitage	9.49	8.09	4.63	0.38
055-060	Igneous	Debitage	11.82	4.24	1.69	0.06
055-060	Igneous	Debitage	6.70	7.62	2.21	0.10
055-060	Igneous	Debitage	9.68	6.83	1.49	0.06
055-060	Chert (Monterey)	Flake	17.78	14.87	2.33	0.45
055-060	Chert (Monterey)	Flake (heat treated)	24.28	37.22	8.41	5.65
055-060	Chert (Monterey)	Flake (heat treated)	16.62	19.76	2.38	0.72
055-060	Chert (Monterey)	Flake (heat treated)	19.48	20.27	4.85	2.36
055-060	Chert (Monterey)	Flake (heat treated)	9.38	11.04	2.11	0.23

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
055-060	Chert (SCRI)	Debitage	11.64	7.78	4.29	0.24
055-060	Chert (SCRI)	Debitage	9.29	4.39	1.78	0.07
055-060	Chert (SCRI)	Debitage	5.00	3.09	0.68	0.05
055-060	Chert (SCRI)	Debitage (heat treated)	25.99	17.23	6.38	1.86
055-060	Chert (SCRI)	Debitage (heat treated)	25.39	15.79	5.23	1.48
055-060	Chert (SCRI)	Debitage (heat treated)	22.91	13.62	6.29	1.37
055-060	Chert (SCRI)	Debitage (heat treated)	17.47	13.94	3.01	0.56
055-060	Chert (Monterey)	Debitage (heat treated)	14.92	5.74	6.30	0.40
055-060	Chert (Monterey)	Debitage (heat treated)	12.98	8.22	3.00	0.19
060-065	Chert (SCRI)	Flake (retouched)	18.50	14.40	3.99	0.81
060-065	Igneous	Flake	38.49	25.78	8.00	6.15
060-065	Igneous	Flake	10.73	27.84	4.16	1.64
060-065	Igneous	Flake	15.86	18.08	2.40	1.26
060-065	Igneous	Flake	19.25	16.94	3.42	1.43
060-065	Igneous	Flake	12.78	10.12	1.70	0.24
060-065	Igneous	Flake	7.46	20.33	8.33	1.07
060-065	Igneous	Flake	16.21	18.68	5.70	1.20
060-065	Igneous	Flake	13.40	10.62	3.28	0.62
060-065	Igneous	Flake	9.06	12.32	1.31	0.19
060-065	Igneous	Flake	11.54	15.78	1.69	0.67
060-065	Igneous	Flake	13.73	17.59	1.96	0.54
060-065	Igneous	Flake	12.20	16.08	3.59	0.63
060-065	Igneous	Flake	15.83	14.51	2.10	0.70
060-065	Igneous	Flake	16.59	12.76	1.32	0.46
060-065	Igneous	Flake	12.16	8.84	2.11	0.31
060-065	Igneous	Flake	8.98	9.09	0.69	0.12
060-065	Chert (SCRI)	Debitage	12.13	5.94	2.52	0.14
060-065	Chert (SCRI)	Debitage	8.21	4.85	1.62	0.05
060-065	Chert (SCRI)	Debitage	9.52	4.18	1.12	0.04
060-065	Chert (SCRI)	Flake (retouched)	13.39	19.74	2.55	0.78
060-065	Chert (SCRI)	Flake (heat treated)	44.69	35.15	12.70	16.05
060-065	Chert (SCRI)	Flake (heat treated)	24.42	19.98	5.62	2.88
060-065	Chert (SCRI)	Flake (heat treated)	23.61	17.08	3.59	1.87
060-065	Igneous	Debitage	32.68	25.43	6.82	4.31
060-065	Igneous	Debitage	26.17	13.08	6.90	2.33
060-065	Igneous	Debitage	18.73	13.28	5.21	0.92
060-065	Igneous	Debitage	18.56	11.67	4.10	0.84
060-065	Igneous	Debitage	14.89	9.15	4.00	0.32
060-065	Igneous	Debitage	35.70	23.81	7.59	5.11

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
060-065	Igneous	Debitage	28.41	23.99	6.34	4.39
060-065	Igneous	Debitage	20.83	11.48	7.78	1.47
060-065	Igneous	Debitage	20.40	12.79	4.20	1.03
060-065	Igneous	Debitage	19.70	9.42	8.10	1.09
060-065	Igneous	Debitage	16.82	15.52	4.32	0.83
060-065	Igneous	Debitage	16.24	17.48	5.62	1.28
060-065	Igneous	Debitage	15.10	9.69	3.39	0.52
060-065	Igneous	Debitage	18.19	6.17	5.69	0.45
060-065	Igneous	Debitage	11.69	7.37	3.38	0.31
060-065	Igneous	Debitage	14.25	7.15	4.59	0.36
060-065	Chert (SCRI)	Debitage (heat treated)	17.49	12.49	2.79	0.52
060-065	Chert (SCRI)	Debitage (heat treated)	11.89	9.57	3.90	0.40
060-065	Chert (SCRI)	Debitage (heat treated)	12.33	4.30	3.78	0.08
065-070	Igneous	Flake	23.98	42.18	5.68	5.97
065-070	Igneous	Flake	25.90	23.12	10.62	5.10
070-075	Igneous	Flake	36.42	40.34	6.09	8.40
070-075	Chert (SCRI)	Debitage (heat treated)	25.39	11.70	7.30	2.60
070-075	Igneous	Debitage	36.19	31.60	5.07	4.75
070-075	Igneous	Debitage	27.99	20.49	4.39	2.34
000-005[b]	Igneous	Debitage	30.78	14.99	10.68	3.73
005-010	Chert (SCRI)	Debitage	10.31	6.81	3.73	3.79
005-010	Chert (SCRI)	Debitage (heat treated)	12.69	6.81	6.29	0.45
005-010	Chert (SCRI)	Debitage (heat treated)	10.87	6.09	6.90	0.48
005-010	Chert (SCRI)	Debitage (heat treated)	10.13	9.92	3.10	0.19
005-010	Chert (SCRI)	Debitage (heat treated)	6.44	6.91	3.89	0.13
005-010	Chert (SCRI)	Flake (heat treated)	15.18	17.40	2.68	1.07
005-010	Chert (SCRI)	Flake (heat treated)	20.28	12.92	2.10	0.70
005-010	Chert (SCRI)	Flake (heat treated)	11.38	11.42	1.67	0.37
005-010	Chert (SCRI)	Flake (heat treated)	19.99	13.33	5.32	1.43
005-010	Chert (SCRI)	Flake (heat treated)	18.11	13.42	2.10	0.64
005-010	Chert (SCRI)	Flake (heat treated)	10.41	9.21	2.59	0.29
005-010	Chert (SCRI)	Flake (heat treated)	11.39	6.68	1.62	0.15
005-010	Chert (SCRI)	Flake (heat treated)	10.41	8.99	1.40	0.13
005-010	Igneous	Debitage	28.03	26.61	3.70	2.71
005-010	Igneous	Debitage	25.31	20.71	9.30	1.88
005-010	Igneous	Debitage	15.61	6.90	4.40	0.45
005-010	Igneous	Debitage	11.45	4.61	4.71	0.17
005-010	Igneous	Debitage	13.49	8.90	4.79	0.39
005-010	Igneous	Debitage	9.80	8.91	5.49	0.31

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
005-010	Igneous	Debitage	10.29	6.20	3.50	0.21
005-010	Igneous	Debitage	8.81	4.67	3.00	0.14
005-010	Igneous	Debitage	7.02	4.85	3.10	0.08
005-010	Igneous	Debitage	7.72	5.29	3.80	0.13
005-010	Igneous	Debitage	8.02	5.91	1.61	0.09
005-010	Igneous	Debitage	8.15	6.11	2.08	0.09
005-010	Igneous	Debitage	7.19	4.22	1.88	0.05
005-010	Igneous	Debitage	7.70	4.19	1.87	0.06
005-010	Igneous	Debitage	7.15	5.01	1.26	0.05
005-010	Igneous	Flake	27.41	29.59	9.79	7.23
005-010	Igneous	Flake	13.19	8.91	2.90	0.30
005-010	Igneous	Flake	9.19	8.89	1.89	0.18
005-010	Igneous	Flake	12.25	11.62	2.81	0.52
005-010	Igneous	Flake	13.28	13.18	3.01	0.53
005-010	Igneous	Flake	7.29	8.21	2.10	0.15
005-010	Igneous	Flake	7.99	7.60	1.10	0.09
005-010	Igneous	Flake	7.51	7.34	1.69	0.11
005-010	Igneous	Flake	5.30	4.88	0.70	0.05
010-015	Igneous	Flake (retouched)	31.21	16.13	6.91	2.24
010-015	Igneous	Flake	22.18	26.00	4.99	2.64
010-015	Igneous	Flake	15.33	22.58	6.82	1.66
010-015	Chert (SCRI)	Flake (heat treated)	41.63	29.46	11.78	12.74
010-015	Chert (SCRI)	Flake (heat treated)	21.42	18.98	4.59	1.87
015-020	Igneous	Flake	44.69	37.39	11.62	18.81
015-020	Igneous	Flake	18.49	21.78	2.92	1.93
015-020	Igneous	Flake	18.08	18.92	3.09	1.45
015-020	Igneous	Flake	30.86	61.59	5.68	16.59
015-020	Igneous	Flake	55.88	41.09	15.19	21.65
015-020	Igneous	Flake	21.78	24.48	6.03	2.67
015-020	Igneous	Flake	21.78	31.34	3.80	3.31
015-020	Igneous	Flake	21.03	23.67	6.20	3.85
015-020	Igneous	Flake	13.72	10.60	3.32	0.51
015-020	Igneous	Debitage	24.38	19.38	11.62	3.26
015-020	Igneous	Debitage	32.62	12.18	6.45	2.31
015-020	Igneous	Debitage	22.89	11.18	5.16	1.24
015-020	Chert (SCRI)	Flake (heat treated)	25.51	17.81	3.75	2.47
015-020	Chert (SCRI)	Debitage (heat treated)	36.89	19.21	8.83	3.55
015-020	Chert (SCRI)	Debitage (heat treated)	15.34	14.51	7.14	1.36
020-025	Chert (SCRI)	Debitage	18.88	7.59	6.57	0.50

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
020-025	Chert (SCRI)	Debitage	13.11	5.59	5.01	0.24
020-025	Chert (SCRI)	Debitage	5.81	5.80	3.81	0.13
020-025	Chert (SCRI)	Debitage	12.01	7.39	5.85	0.37
020-025	Chert (SCRI)	Debitage	11.52	9.70	4.64	0.34
020-025	Chert (SCRI)	Debitage	9.89	5.02	3.33	0.12
020-025	Chert (SCRI)	Debitage	7.49	6.22	1.19	0.04
020-025	Chert (SCRI)	Debitage	4.59	4.18	1.50	0.02
020-025	Chert (SCRI)	Debitage	7.00	5.95	4.20	0.07
020-025	Chert (SCRI)	Debitage	9.12	4.29	1.61	0.04
020-025	Chert (SCRI)	Debitage	8.21	4.99	2.21	0.08
020-025	Chert (SCRI)	Debitage	4.29	3.51	2.00	0.02
020-025	Chert (SCRI)	Debitage	5.00	4.22	0.89	0.04
020-025	Chert (SCRI)	Debitage	4.39	3.40	1.70	0.02
020-025	Chert (SCRI)	Flake (retouched)	43.38	29.51	5.00	6.05
020-025	Chert (SCRI)	Flake (retouched)	20.76	9.04	1.32	0.39
020-025	Igneous	Flake	45.70	28.59	8.93	13.49
020-025	Igneous	Flake	29.11	24.49	7.29	5.30
020-025	Igneous	Flake	21.49	16.61	4.15	1.78
020-025	Igneous	Flake	16.01	8.70	2.78	0.67
020-025	Igneous	Flake	7.53	7.59	1.13	0.08
020-025	Igneous	Flake	34.51	13.19	7.53	4.90
020-025	Igneous	Flake	26.58	26.72	7.78	5.35
020-025	Igneous	Flake	24.25	21.88	6.17	3.37
020-025	Igneous	Flake	16.86	26.59	5.72	2.41
020-025	Igneous	Flake	15.99	14.39	2.92	0.96
020-025	Igneous	Flake	2.97	26.71	3.90	1.58
020-025	Igneous	Flake	16.92	14.12	2.31	1.07
020-025	Igneous	Flake	14.91	19.40	4.68	1.52
020-025	Igneous	Flake	18.83	21.20	2.90	1.55
020-025	Igneous	Flake	16.59	13.30	1.61	0.81
020-025	Igneous	Flake	8.22	15.01	2.97	0.48
020-025	Igneous	Flake	9.01	9.90	1.49	0.19
020-025	Igneous	Flake	9.57	9.10	1.41	0.14
020-025	Igneous	Flake	12.95	7.89	1.80	0.19
020-025	Chert (Monterey)	Flake	15.29	16.59	2.61	0.74
020-025	Chert (Monterey)	Flake	8.91	13.00	2.39	0.27
020-025	Chert (Monterey)	Flake	13.70	4.19	2.00	0.17
020-025	Chert (SCRI)	Flake	30.88	21.39	4.33	2.33
020-025	Chert (SCRI)	Flake	22.57	13.40	2.36	0.93

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
020-025	Chert (SCRI)	Flake	18.59	14.92	3.79	0.88
020-025	Chert (SCRI)	Flake	19.11	15.61	1.94	0.57
020-025	Chert (SCRI)	Flake	16.66	8.39	9.92	1.16
020-025	Chert (SCRI)	Flake	16.32	10.49	1.70	0.45
020-025	Igneous	Flake (retouched)	58.16	43.42	13.16	23.79
020-025	Chert (SCRI)	Flake (retouched)	49.49	28.01	7.91	10.26
020-025	Igneous	Flake	28.83	22.09	10.11	6.29
020-025	Igneous	Flake	33.39	19.51	7.23	4.71
020-025	Chert (SCRI)	Flake	22.71	17.61	5.09	2.28
020-025	Igneous	Debitage	26.79	24.29	10.42	3.67
020-025	Igneous	Debitage	30.51	8.71	8.26	1.71
020-025	Igneous	Debitage	19.59	8.20	4.58	0.74
020-025	Igneous	Debitage	16.38	15.27	5.60	1.13
020-025	Igneous	Debitage	13.72	6.49	3.76	0.22
020-025	Igneous	Debitage	26.29	17.48	6.09	2.02
020-025	Igneous	Debitage	17.40	8.99	7.89	0.84
020-025	Igneous	Debitage	26.40	14.25	6.68	3.03
020-025	Igneous	Debitage	16.41	9.68	8.49	1.23
020-025	Igneous	Debitage	17.20	12.28	3.19	0.64
020-025	Igneous	Debitage	18.23	17.46	2.52	0.67
020-025	Igneous	Debitage	19.58	10.81	6.02	0.77
020-025	Igneous	Debitage	14.90	14.69	3.09	0.65
020-025	Igneous	Debitage	16.09	16.81	7.69	1.37
020-025	Igneous	Debitage	15.59	10.70	1.72	0.27
020-025	Igneous	Debitage	13.01	6.81	3.71	0.28
020-025	Igneous	Debitage	12.34	6.39	2.31	0.12
020-025	Igneous	Debitage	14.50	7.48	2.69	0.14
020-025	Igneous	Debitage	10.71	5.01	3.81	0.18
020-025	Igneous	Debitage	8.61	4.71	2.42	0.08
020-025	Chert (SCRI)	Flake (heat treated)	17.10	15.01	2.62	0.75
020-025	Chert (SCRI)	Flake (heat treated)	9.28	26.31	4.82	1.64
020-025	Chert (SCRI)	Flake (heat treated)	19.01	18.78	2.60	1.21
020-025	Chert (SCRI)	Flake (heat treated)	10.95	13.20	4.00	0.47
020-025	Chert (SCRI)	Flake (heat treated)	10.91	8.28	2.21	0.33
020-025	Chert (SCRI)	Flake (heat treated)	9.01	5.88	1.98	0.14
020-025	Chert (SCRI)	Flake (heat treated)	6.19	6.49	1.81	0.11
025-030	Chert (SCRI)	Flake	45.21	37.48	7.49	10.76
025-030	Chert (SCRI)	Flake	25.39	15.74	4.11	1.49
025-030	Chert (SCRI)	Flake	7.99	10.12	2.29	0.49

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
025-030	Chert (SCRI)	Flake	20.09	10.19	2.20	0.57
025-030	Chert (SCRI)	Flake	13.12	7.19	3.23	0.36
025-030	Chert (SCRI)	Flake	11.59	7.25	2.02	0.21
025-030	Chert (SCRI)	Flake	12.30	7.05	1.51	0.14
025-030	Chert (SCRI)	Flake	8.79	7.58	0.89	0.10
025-030	Chert (SCRI)	Flake	8.57	7.62	0.69	0.10
025-030	Chert (SCRI)	Flake	6.78	5.36	0.76	0.04
025-030	Chert (SCRI)	Flake	5.61	3.47	0.59	0.01
025-030	Chert (SCRI)	Flake	6.89	3.81	0.50	0.00
025-030	Chert (SCRI)	Flake	5.86	4.19	0.68	0.03
025-030	Chert (SCRI)	Flake	6.26	4.14	0.50	0.00
025-030	Chert (SCRI)	Flake	6.61	4.28	0.81	0.02
025-030	Chert (SCRI)	Flake	4.87	4.69	0.71	0.02
025-030	Chert (SCRI)	Flake	3.76	3.42	0.59	0.02
025-030	Chert (SCRI)	Flake	5.89	4.02	1.19	0.02
025-030	Chert (SCRI)	Flake	5.68	2.99	1.00	0.03
025-030	Chert (SCRI)	Flake	4.19	4.09	0.62	0.01
025-030	Chert (SCRI)	Flake	4.00	3.99	0.17	0.00
025-030	Chert (Monterey)	Flake	59.49	29.81	10.50	15.15
025-030	Chert (Monterey)	Flake	28.28	18.50	8.51	4.35
025-030	Chert (Monterey)	Flake	10.10	5.09	1.50	0.04
025-030	Chert (Monterey)	Flake	7.39	7.32	0.62	0.07
025-030	Igneous	Flake (retouched)	54.31	34.49	4.50	16.17
025-030	Igneous	Flake (retouched)	25.70	18.61	2.71	1.48
025-030	Igneous	Flake (retouched)	16.51	34.08	2.69	2.83
025-030	Chert (SCRI)	Debitage	8.20	6.49	3.01	0.17
025-030	Chert (SCRI)	Debitage	3.31	3.59	2.90	0.03
025-030	Chert (SCRI)	Debitage	10.19	5.57	1.29	0.07
025-030	Chert (SCRI)	Debitage	8.62	7.21	1.58	0.11
025-030	Chert (SCRI)	Debitage	8.09	6.41	1.10	0.08
025-030	Chert (SCRI)	Debitage	4.71	4.31	0.79	0.02
025-030	Chert (SCRI)	Debitage	6.09	4.41	2.31	0.04
025-030	Chert (SCRI)	Debitage	4.80	2.92	2.01	0.00
025-030	Chert (SCRI)	Debitage	5.21	3.89	0.71	0.02
025-030	Chert (SCRI)	Debitage	4.21	3.61	0.39	0.01
025-030	Chert (SCRI)	Debitage	3.01	2.38	1.91	0.02
025-030	Chert (SCRI)	Debitage	4.97	4.10	1.80	0.05
025-030	Chert (SCRI)	Debitage	4.71	4.31	0.72	0.01
025-030	Chert (SCRI)	Flake	35.49	32.60	6.59	12.16

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
025-030	Igneous	Flake	46.19	33.10	10.50	15.60
025-030	Igneous	Flake	29.51	37.99	4.49	9.17
025-030	Igneous	Flake	24.58	15.27	5.00	2.39
025-030	Igneous	Flake	7.88	4.00	3.53	1.07
025-030	Igneous	Flake	10.59	14.49	2.41	0.48
025-030	Igneous	Flake	13.19	14.35	1.81	0.55
025-030	Igneous	Flake	11.91	16.41	1.25	0.34
025-030	Igneous	Flake	6.97	10.11	1.08	0.13
025-030	Igneous	Flake	9.20	4.94	0.39	0.04
025-030	Igneous	Flake	4.97	6.07	0.32	0.02
025-030	Igneous	Flake	51.91	28.29	7.20	14.06
025-030	Igneous	Flake	28.28	29.89	2.49	5.56
025-030	Igneous	Flake	18.99	11.41	2.92	0.85
025-030	Igneous	Flake	7.71	8.69	2.66	0.17
025-030	Igneous	Flake	18.56	12.21	1.51	0.59
025-030	Igneous	Flake	12.71	6.32	1.09	0.16
025-030	Igneous	Flake	8.92	8.89	0.89	0.15
025-030	Igneous	Flake	5.91	6.89	0.92	0.04
025-030	Igneous	Flake	7.36	11.11	1.08	0.19
025-030	Igneous	Flake	7.50	7.30	0.81	0.05
025-030	Igneous	Flake	6.78	5.29	0.70	0.04
025-030	Igneous	Flake	6.50	6.39	0.41	0.02
025-030	Igneous	Flake	6.03	6.59	0.90	0.06
025-030	Igneous	Flake	5.41	3.71	0.59	0.02
025-030	Igneous	Flake	6.09	4.20	0.81	0.00
025-030	Igneous	Debitage	22.41	12.21	6.49	1.35
025-030	Igneous	Debitage	5.19	10.11	3.09	0.46
025-030	Igneous	Debitage	9.70	7.71	1.99	0.13
025-030	Igneous	Debitage	8.23	5.01	1.19	0.05
025-030	Igneous	Debitage	6.33	4.71	0.64	0.00
025-030	Igneous	Debitage	23.59	14.78	3.69	1.27
025-030	Igneous	Debitage	24.62	15.12	4.14	1.66
025-030	Igneous	Debitage	14.01	9.33	2.00	0.31
025-030	Igneous	Debitage	14.41	9.82	5.13	0.54
025-030	Igneous	Debitage	12.50	11.09	2.89	0.41
025-030	Igneous	Debitage	15.39	6.81	3.70	0.36
025-030	Igneous	Debitage	11.25	7.29	1.70	0.16
025-030	Igneous	Debitage	12.61	6.01	5.19	0.30
025-030	Igneous	Debitage	10.92	6.38	3.51	0.20

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
025-030	Igneous	Debitage	8.00	4.29	2.58	0.12
025-030	Igneous	Debitage	7.29	4.73	1.79	0.05
025-030	Igneous	Debitage	5.58	5.80	1.74	0.05
025-030	Igneous	Debitage	5.98	6.00	2.69	0.09
025-030	Igneous	Debitage	6.70	4.30	0.71	0.02
025-030	Igneous	Debitage	9.19	4.29	1.29	0.06
025-030	Igneous	Debitage	8.69	5.91	1.69	0.10
025-030	Igneous	Debitage	5.99	3.91	0.73	0.02
025-030	Igneous	Debitage	6.01	4.01	1.90	0.04
025-030	Igneous	Debitage	6.27	5.29	1.19	0.03
025-030	Igneous	Debitage	6.80	3.62	1.22	0.04
025-030	Igneous	Debitage	5.86	4.49	0.62	0.03
025-030	Igneous	Debitage	6.24	3.06	1.60	0.01
025-030	Igneous	Debitage	3.89	1.69	0.65	0.00
025-030	Igneous	Debitage	5.89	3.21	3.10	0.05
025-030	Igneous	Debitage	5.69	4.81	1.49	0.04
025-030	Igneous	Debitage	7.81	4.51	1.90	0.07
025-030	Igneous	Debitage	7.92	3.62	1.79	0.00
025-030	Igneous	Debitage	6.92	3.21	1.07	0.02
025-030	Igneous	Debitage	6.59	5.00	1.61	0.03
025-030	Igneous	Debitage	6.40	2.02	1.01	0.00
025-030	Igneous	Debitage	6.21	3.62	1.49	0.04
025-030	Igneous	Debitage	4.78	2.12	1.25	0.00
025-030	Chert (Monterey)	Debitage	19.47	10.01	5.99	0.98
025-030	Chert (Monterey)	Debitage	14.83	8.74	5.39	0.46
025-030	Chert (Monterey)	Debitage	11.80	7.69	4.71	0.24
025-030	Chert (Monterey)	Debitage	10.41	6.09	6.11	0.21
025-030	Chert (Monterey)	Debitage	4.78	4.08	2.61	0.03
035-040	Chert (SCRI)	Flake	12.51	17.71	5.43	1.58
035-040	Igneous	Flake	13.11	22.19	2.38	0.79
035-040	Igneous	Flake	12.47	18.02	2.22	0.51
035-040	Igneous	Flake	13.11	5.99	1.29	0.12
005-010[c]	Igneous	Flake	26.69	21.78	7.20	5.97
005-010	Igneous	Flake	18.80	8.18	3.78	2.02
005-010	Igneous	Flake	16.83	23.18	7.26	3.09
005-010	Chert (SCRI)	Flake	13.16	14.38	2.01	0.46
005-010	Igneous	Debitage	37.42	24.23	7.52	5.28
005-010	Igneous	Debitage	21.22	17.62	4.79	1.46
005-010	Igneous	Debitage	20.81	4.59	6.00	1.28

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
005-010	Igneous	Debitage	18.89	23.10	2.74	1.33
010-015	Chert (SCRI)	Flake (retouched)	42.98	20.97	7.79	7.89
010-015	Igneous	Flake	42.12	41.32	9.59	14.92
010-015	Igneous	Flake	45.00	29.01	7.89	9.92
010-015	Igneous	Flake	34.91	25.01	8.23	6.48
010-015	Igneous	Flake	26.99	24.42	9.28	5.91
010-015	Igneous	Flake	34.42	29.79	5.01	6.10
010-015	Igneous	Flake	22.30	33.54	11.78	6.22
010-015	Igneous	Flake	18.52	13.97	5.12	1.08
010-015	Chert (SCRI)	Flake	17.81	32.72	6.40	3.23
010-015	Igneous	Debitage	23.89	22.42	7.13	2.62
010-015	Igneous	Debitage	27.02	21.19	8.11	3.86
010-015	Igneous	Debitage	25.00	16.68	5.80	2.11
010-015	Igneous	Debitage	24.83	17.42	6.38	2.18
010-015	Igneous	Debitage	23.09	15.02	4.10	1.57
010-015	Igneous	Debitage	20.80	9.11	6.19	0.91
010-015	Chert (SCRI)	Debitage	17.42	9.50	7.91	0.92
010-015	Chert (SCRI)	Debitage (heat treated)	26.00	15.21	5.34	1.76
010-015	Chert (SCRI)	Debitage (heat treated)	15.61	8.21	5.42	0.57
015-020	Igneous	Flake (retouched)	17.00	11.11	2.61	0.43
015-020	Igneous	Flake	17.49	26.89	2.50	1.79
015-020	Igneous	Flake	8.90	14.10	1.38	0.41
015-020	Igneous	Flake	14.69	9.19	2.63	0.33
015-020	Igneous	Flake	14.00	9.61	2.00	0.45
015-020	Igneous	Flake	8.50	1.42	2.12	0.15
015-020	Igneous	Flake	10.83	6.39	1.21	0.07
015-020	Igneous	Flake	8.95	5.80	0.71	0.08
015-020	Igneous	Flake	7.19	6.31	1.42	0.10
015-020	Igneous	Flake	8.24	6.26	0.80	0.06
015-020	Igneous	Debitage	21.89	12.79	6.61	1.26
015-020	Igneous	Debitage	17.30	10.91	5.90	0.86
015-020	Igneous	Debitage	12.51	8.39	2.09	0.13
015-020	Igneous	Debitage	18.08	10.01	4.79	0.97
015-020	Igneous	Debitage	13.79	14.32	8.66	0.93
015-020	Igneous	Debitage	18.20	11.09	3.62	0.73
015-020	Igneous	Debitage	13.77	9.71	5.01	0.67
015-020	Igneous	Debitage	16.09	8.81	4.35	0.39
015-020	Igneous	Debitage	9.01	7.79	3.59	0.24
015-020	Igneous	Debitage	7.60	4.84	2.85	0.10

TABLE 22

DEBITAGE AND FLAKES FROM SCRI-845

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
015-020	Igneous	Debitage	7.30	5.26	3.09	0.13
015-020	Igneous	Debitage	6.91	6.51	1.16	0.06
015-020	Igneous	Debitage	7.48	6.62	1.51	0.07
015-020	Igneous	Debitage	7.10	2.60	2.50	0.06
015-020	Igneous	Debitage	8.20	4.36	1.30	0.05
015-020	Igneous	Debitage	6.99	4.28	3.28	0.06
015-020	Igneous	Debitage	7.49	2.91	1.41	0.03
015-020	Igneous	Debitage	3.20	3.30	1.12	0.00
015-020	Chert (Monterey)	Flake	19.50	16.80	1.85	0.75
015-020	Chert (Monterey)	Flake	21.89	21.80	5.20	3.04
015-020	Chert (Monterey)	Flake	18.90	14.19	2.11	0.98
015-020	Chert (Monterey)	Flake	9.22	11.27	0.92	0.28
015-020	Chert (Monterey)	Flake	18.48	11.29	4.41	0.59
015-020	Chert (SCRI)	Flake	18.54	14.80	5.40	1.48
015-020	Chert (SCRI)	Flake (retouched)	13.69	7.25	0.94	0.17
015-020	Chert (Monterey)	Debitage	10.39	7.51	4.72	0.24
015-020	Chert (SCRI)	Debitage	18.61	8.82	5.69	0.88
015-020	Chert (SCRI)	Debitage	8.89	4.21	3.00	0.07
015-020	Chert (SCRI)	Debitage	8.40	6.15	1.00	0.05
015-020	Chert (SCRI)	Debitage	5.99	3.35	2.49	0.07
015-020	Chert (SCRI)	Debitage	8.32	6.50	2.09	0.11
015-020	Chert (SCRI)	Debitage	9.20	4.99	1.80	0.10
015-020	Chert (SCRI)	Debitage	6.39	4.30	2.21	0.05
015-020	Chert (SCRI)	Debitage	7.50	7.04	2.51	0.08
015-020	Chert (SCRI)	Debitage	7.30	4.93	1.00	0.03
015-020	Chert (SCRI)	Debitage	5.71	3.19	1.39	0.03
015-020	Chert (SCRI)	Debitage	5.14	2.90	2.39	0.01
015-020	Chert (SCRI)	Debitage	4.71	4.00	1.00	0.01
015-020	Chert (SCRI)	Debitage	6.11	4.33	0.61	0.02
015-020	Chert (SCRI)	Debitage	4.00	3.20	1.51	0.02
015-020	Chert (SCRI)	Flake (heat treated)	14.26	16.69	3.84	0.60
015-020	Chert (SCRI)	Flake (heat treated)	12.99	14.51	1.89	0.39
015-020	Chert (SCRI)	Flake (heat treated)	8.90	8.81	0.98	0.09
015-020	Chert (SCRI)	Flake (heat treated)	5.32	9.71	0.91	0.07
015-020	Chert (SCRI)	Debitage (heat treated)	9.72	9.29	4.47	0.26
015-020	Chert (SCRI)	Debitage (heat treated)	10.01	7.50	3.41	0.26

[a] Unit 15E, 27N
[b] Unit 18E, 18N
[c] Unit 18E, 19N

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
025-030[a]	Igneous	Flake	35.12	24.58	12.12	12.95
025-030	Igneous	Flake (retouched)	62.92	41.59	10.09	16.67
030-035	Igneous	Flake (retouched)	66.39	54.28	16.46	37.39
035-040	Igneous	Debitage	31.26	16.89	12.22	3.18
035-040	Igneous	Debitage	32.30	13.32	8.91	3.66
035-040	Igneous	Debitage	20.99	17.02	6.11	1.89
040-045	Igneous	Flake	59.22	80.71	18.71	99.70
050-055	Igneous	Flake	23.50	36.68	8.61	5.78
065-070	Igneous	Flake	34.09	23.04	11.96	10.03
065-070	Igneous	Flake (retouched)	52.18	43.92	16.15	16.41
070-075	Chert (SCRI)	Flake (heat treated)	16.68	18.59	2.53	1.13
075-080	Chert (SCRI)	Flake	17.60	10.42	1.78	0.55
075-080	Chert (SCRI)	Flake	10.59	7.41	5.28	0.36
075-080	Chert (SCRI)	Flake	9.22	5.93	0.37	0.02
075-080	Igneous	Debitage	28.30	16.48	5.23	2.02
075-080	Igneous	Debitage	31.06	30.63	6.44	7.42
075-080	Chert (SCRI)	Debitage (heat treated)	26.29	15.92	9.78	2.58
075-080	Chert (SCRI)	Flake (heat treated)	19.83	11.51	4.68	1.11
080-085	Igneous	Flake	50.79	53.72	12.69	20.45
080-085	Igneous	Flake (retouched)	55.06	42.79	18.43	46.91
085-093	Chert (SCRI)	Flake	8.09	12.49	0.81	0.14
085-093	Chert (SCRI)	Flake	27.84	19.10	6.23	2.72
085-093	Chert (SCRI)	Flake	11.40	8.43	1.60	0.22
085-093	Chert (SCRI)	Flake	7.11	5.68	0.98	0.06
085-093	Igneous	Flake (retouched)	24.73	23.23	7.01	2.88
085-093	Igneous	Flake (retouched)	23.32	13.88	4.32	1.05
085-093	Igneous	Flake (retouched)	16.55	11.68	3.72	0.57
085-093	Igneous	Flake (retouched)	11.49	8.12	2.09	0.17
085-093	Igneous	Flake (retouched)	7.29	6.81	0.49	0.06
085-093	Igneous	Flake (retouched)	7.70	9.22	0.79	0.11
085-093	Igneous	Flake (retouched)	6.52	5.39	1.02	0.06
085-093	Igneous	Flake (retouched)	3.53	7.28	0.58	0.02
085-093	Igneous	Debitage	32.01	34.40	8.99	8.75
085-093	Igneous	Debitage	22.72	16.99	7.49	2.89
085-093	Igneous	Debitage	35.49	26.49	13.03	11.98
085-093	Igneous	Debitage	34.24	20.13	5.43	3.18
085-093	Igneous	Debitage	16.73	9.50	6.48	0.92
085-093	Igneous	Debitage	17.19	6.92	1.88	0.19
085-093	Igneous	Flake	29.40	20.28	2.99	3.30

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
085-093	Igneous	Flake	17.00	23.89	4.08	2.04
085-093	Igneous	Flake	18.11	13.88	6.42	1.53
085-093	Igneous	Flake	13.70	14.68	1.50	0.46
085-093	Igneous	Flake	20.08	22.71	7.48	2.21
085-093	Igneous	Flake	12.30	17.48	2.20	0.55
085-093	Igneous	Flake	18.68	13.90	2.87	0.80
085-093	Igneous	Flake	12.88	10.58	3.00	0.30
085-093	Igneous	Flake	7.98	9.01	2.32	0.13
085-093	Igneous	Flake	8.27	7.36	1.13	0.11
085-093	Igneous	Flake	20.48	20.42	3.82	2.32
085-093	Chert (SCRI)	Debitage	6.92	3.07	2.99	0.06
085-093	Chert (SCRI)	Debitage	13.99	7.87	1.64	0.16
085-093	Chert (SCRI)	Debitage	4.63	4.03	1.12	0.02
085-093	Chert (SCRI)	Debitage	8.60	3.11	1.22	0.04
085-093	Chert (SCRI)	Debitage	6.42	3.30	1.23	0.04
085-093	Chert (SCRI)	Flake (heat treated)	22.28	24.99	5.61	2.99
085-093	Chert (SCRI)	Flake (heat treated)	17.24	12.18	4.14	0.78
085-093	Chert (SCRI)	Flake (heat treated)	6.71	5.70	1.30	0.04
093-095	Igneous	Debitage	42.71	31.28	12.99	8.50
093-095	Igneous	Debitage	28.82	13.50	10.29	3.02
093-095	Igneous	Debitage	29.21	10.71	5.69	2.08
093-095	Igneous	Debitage	28.79	13.32	9.18	2.20
095-100	Igneous	Flake	25.59	29.42	5.49	5.37
095-100	Igneous	Flake	16.60	33.18	9.47	6.35
095-100	Igneous	Debitage	34.21	21.56	8.31	4.91
095-100	Igneous	Debitage	24.50	14.00	6.79	1.94
095-100	Igneous	Debitage	33.22	27.13	17.24	9.26
095-100	Igneous	Debitage	39.69	28.60	12.61	11.66
095-100	Igneous	Debitage	30.01	21.31	12.88	6.85
095-100	Igneous	Debitage	24.41	19.72	3.38	2.09
100-105	Igneous	Flake (retouched)	38.79	50.08	13.61	16.71
100-105	Igneous	Flake	6.11	26.72	8.49	10.66
105-110	Igneous	Flake (retouched)	33.12	17.38	5.70	3.35
105-110	Igneous	Flake (retouched)	34.01	22.37	3.50	2.19
105-110	Igneous	Flake	34.94	46.20	10.09	19.44
105-110	Igneous	Flake	17.28	26.71	2.38	1.29
105-110	Igneous	Flake	12.99	10.00	2.82	0.36
105-110	Igneous	Flake	11.70	10.74	1.70	0.20
105-110	Igneous	Flake	31.78	42.92	10.28	13.22

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
105-110	Igneous	Flake	16.53	10.93	3.09	0.54
105-110	Igneous	Flake	11.71	10.48	1.73	0.29
105-110	Igneous	Flake	8.59	14.40	1.30	0.30
105-110	Igneous	Flake	14.79	8.10	3.14	0.29
105-110	Igneous	Flake	11.61	15.20	2.03	0.34
105-110	Igneous	Flake	10.46	7.12	1.52	0.16
105-110	Igneous	Flake	9.66	8.27	1.00	0.10
105-110	Igneous	Flake	9.49	9.39	1.67	0.15
105-110	Igneous	Flake	6.50	7.74	1.32	0.12
105-110	Igneous	Debitage	26.01	17.42	7.92	3.19
105-110	Igneous	Debitage	29.19	4.26	6.63	2.11
105-110	Igneous	Debitage	19.19	14.42	5.85	1.38
105-110	Igneous	Debitage	20.34	7.51	4.09	0.46
105-110	Igneous	Debitage	17.48	5.42	6.21	0.46
105-110	Igneous	Debitage	17.94	12.18	3.69	0.60
105-110	Igneous	Debitage	22.50	9.26	5.50	0.85
105-110	Igneous	Debitage	12.30	10.61	4.47	0.60
105-110	Igneous	Debitage	15.40	6.92	2.78	0.21
105-110	Igneous	Debitage	13.22	7.03	2.18	0.16
105-110	Igneous	Debitage	21.01	15.60	5.49	1.42
105-110	Igneous	Debitage	16.21	14.19	4.40	0.71
105-110	Igneous	Debitage	14.13	10.09	3.18	0.28
105-110	Igneous	Debitage	18.42	11.64	3.71	0.62
105-110	Igneous	Debitage	14.66	8.71	4.36	0.42
105-110	Igneous	Debitage	11.50	8.31	6.09	0.46
105-110	Igneous	Debitage	14.66	7.27	3.12	0.32
105-110	Igneous	Debitage	11.59	8.31	3.83	0.26
105-110	Igneous	Debitage	15.07	7.48	1.93	0.20
105-110	Igneous	Debitage	12.13	4.65	3.90	0.19
105-110	Igneous	Debitage	12.43	5.44	1.58	0.10
105-110	Igneous	Debitage	9.50	4.03	4.62	0.08
105-110	Igneous	Debitage	11.79	4.21	4.89	0.21
105-110	Igneous	Debitage	8.25	7.08	1.50	0.06
105-110	Igneous	Debitage	9.23	4.86	1.98	0.09
105-110	Igneous	Debitage	8.59	2.80	2.82	0.03
105-110	Igneous	Debitage	5.09	6.69	4.02	0.09
105-110	Igneous	Debitage	6.12	3.27	2.19	0.05
105-110	Igneous	Debitage	8.69	3.72	0.88	0.04
105-110	Chert (SCRI)	Debitage	18.23	12.69	2.12	0.38

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
105-110	Chert (SCRI)	Debitage	11.79	6.37	2.86	0.09
105-110	Chert (SCRI)	Debitage	5.71	3.20	1.49	0.03
105-110	Chert (SCRI)	Flake (retouched)	13.92	7.79	2.40	0.24
105-110	Igneous	Debitage	22.92	19.10	5.92	2.40
105-110	Chert (SCRI)	Flake	8.91	10.73	1.01	0.13
105-110	Chert (SCRI)	Flake	9.69	9.81	0.90	0.10
105-110	Chert (SCRI)	Flake	4.86	8.88	0.60	0.04
115-120	Chert (SCRI)	Debitage (heat treated)	10.99	8.39	2.21	0.16
115-120	Chert (SCRI)	Debitage (heat treated)	12.44	5.52	1.92	0.13
115-120	Chert (SCRI)	Debitage (heat treated)	9.06	4.99	1.38	0.06
115-120	Igneous	Flake	25.32	25.72	6.08	3.31
115-120	Igneous	Flake	18.99	28.37	9.42	5.92
115-120	Igneous	Flake	17.03	24.52	2.81	1.71
115-120	Igneous	Flake	15.87	10.92	0.98	0.45
115-120	Igneous	Flake	23.09	15.08	2.38	0.97
115-120	Igneous	Flake	17.49	17.31	3.08	1.25
115-120	Igneous	Flake	16.83	12.47	3.22	0.93
115-120	Igneous	Flake	11.11	13.27	2.90	0.48
115-120	Igneous	Flake	9.70	13.89	3.36	0.50
115-120	Igneous	Flake	15.74	15.39	2.88	0.65
115-120	Igneous	Flake	15.53	9.29	3.43	0.43
115-120	Igneous	Debitage	37.28	14.48	8.98	5.01
115-120	Igneous	Debitage	31.00	19.08	6.44	3.82
115-120	Igneous	Debitage	21.19	18.30	7.42	2.77
115-120	Igneous	Debitage	11.82	9.71	5.69	0.61
115-120	Igneous	Debitage	36.21	14.09	14.61	6.20
115-120	Igneous	Debitage	27.21	23.22	6.89	4.26
115-120	Igneous	Debitage	20.22	16.38	9.01	2.88
115-120	Igneous	Debitage	19.92	11.77	3.34	0.80
115-120	Igneous	Debitage	21.12	10.32	9.18	1.45
115-120	Igneous	Debitage	14.72	6.91	6.99	0.48
115-120	Igneous	Debitage	13.68	9.21	4.48	0.40
115-120	Chert (SCRI)	Flake (heat treated)	27.38	23.90	5.90	2.30
115-120	Chert (SCRI)	Flake (heat treated)	29.61	17.82	6.17	2.84
115-120	Chert (SCRI)	Flake	11.46	19.51	5.18	1.04
115-120	Igneous	Flake (retouched)	49.02	26.71	5.99	8.03
020-025	Igneous	Flake	39.82	54.42	12.24	22.19
045-050	Igneous	Flake (retouched)	31.77	35.88	6.82	8.77
045-050	Igneous	Flake	39.41	25.41	4.70	5.75

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
060-065	Igneous	Flake	36.23	22.79	9.08	5.61
060-065	Igneous	Debitage	38.12	26.59	6.41	5.89
065-070	Igneous	Flake	28.37	17.67	8.18	2.91
065-070	Chert (SCRI)	Flake	20.20	22.79	4.28	2.95
025-030	Igneous	Flake	35.12	24.58	12.12	12.95
025-030	Igneous	Flake (retouched)	62.92	41.59	10.09	16.67
030-035	Igneous	Flake (retouched)	66.39	54.28	16.46	37.39
035-040	Igneous	Debitage	31.26	16.89	12.22	3.18
035-040	Igneous	Debitage	32.30	13.32	8.91	3.66
035-040	Igneous	Debitage	20.99	17.02	6.11	1.89
040-045	Igneous	Flake	59.22	80.71	18.71	99.70
050-055	Igneous	Flake	23.50	36.68	8.61	5.78
065-070	Igneous	Flake	34.09	23.04	11.96	10.03
065-070	Igneous	Flake (retouched)	52.18	43.92	16.15	16.41
070-075	Chert (SCRI)	Flake (heat treated)	16.68	18.59	2.53	1.13
075-080	Chert (SCRI)	Flake	17.60	10.42	1.78	0.55
075-080	Chert (SCRI)	Flake	10.59	7.41	5.28	0.36
075-080	Chert (SCRI)	Flake	9.22	5.93	0.37	0.02
075-080	Igneous	Debitage	28.30	16.48	5.23	2.02
075-080	Igneous	Debitage	31.06	30.63	6.44	7.42
075-080	Chert (SCRI)	Debitage (heat treated)	26.29	15.92	9.78	2.58
075-080	Chert (SCRI)	Flake (heat treated)	19.83	11.51	4.68	1.11
080-085	Igneous	Flake	50.79	53.72	12.69	20.45
080-085	Igneous	Flake (retouched)	55.06	42.79	18.43	46.91
085-093	Chert (SCRI)	Flake	8.09	12.49	0.81	0.14
085-093	Chert (SCRI)	Flake	27.84	19.10	6.23	2.72
085-093	Chert (SCRI)	Flake	11.40	8.43	1.60	0.22
085-093	Chert (SCRI)	Flake	7.11	5.68	0.98	0.06
085-093	Igneous	Flake (retouched)	24.73	23.23	7.01	2.88
085-093	Igneous	Flake (retouched)	23.32	13.88	4.32	1.05
085-093	Igneous	Flake (retouched)	16.55	11.68	3.72	0.57
085-093	Igneous	Flake (retouched)	11.49	8.12	2.09	0.17
085-093	Igneous	Flake (retouched)	7.29	6.81	0.49	0.06
085-093	Igneous	Flake (retouched)	7.70	9.22	0.79	0.11
085-093	Igneous	Flake (retouched)	6.52	5.39	1.02	0.06
085-093	Igneous	Flake (retouched)	3.53	7.28	0.58	0.02
085-093	Igneous	Debitage	32.01	34.40	8.99	8.75
085-093	Igneous	Debitage	22.72	16.99	7.49	2.89
085-093	Igneous	Debitage	35.49	26.49	13.03	11.98

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
085-093	Igneous	Debitage	34.24	20.13	5.43	3.18
085-093	Igneous	Debitage	16.73	9.50	6.48	0.92
085-093	Igneous	Debitage	17.19	6.92	1.88	0.19
085-093	Igneous	Flake	29.40	20.28	2.99	3.30
085-093	Igneous	Flake	17.00	23.89	4.08	2.04
085-093	Igneous	Flake	18.11	13.88	6.42	1.53
085-093	Igneous	Flake	13.70	14.68	1.50	0.46
085-093	Igneous	Flake	20.08	22.71	7.48	2.21
085-093	Igneous	Flake	12.30	17.48	2.20	0.55
085-093	Igneous	Flake	18.68	13.90	2.87	0.80
085-093	Igneous	Flake	12.88	10.58	3.00	0.30
085-093	Igneous	Flake	7.98	9.01	2.32	0.13
085-093	Igneous	Flake	8.27	7.36	1.13	0.11
085-093	Igneous	Flake	20.48	20.42	3.82	2.32
085-093	Chert (SCRI)	Debitage	6.92	3.07	2.99	0.06
085-093	Chert (SCRI)	Debitage	13.99	7.87	1.64	0.16
085-093	Chert (SCRI)	Debitage	4.63	4.03	1.12	0.02
085-093	Chert (SCRI)	Debitage	8.60	3.11	1.22	0.04
085-093	Chert (SCRI)	Debitage	6.42	3.30	1.23	0.04
085-093	Chert (SCRI)	Flake (heat treated)	22.28	24.99	5.61	2.99
085-093	Chert (SCRI)	Flake (heat treated)	17.24	12.18	4.14	0.78
085-093	Chert (SCRI)	Flake (heat treated)	6.71	5.70	1.30	0.04
093-095	Igneous	Debitage	42.71	31.28	12.99	8.50
093-095	Igneous	Debitage	28.82	13.50	10.29	3.02
093-095	Igneous	Debitage	29.21	10.71	5.69	2.08
093-095	Igneous	Debitage	28.79	13.32	9.18	2.20
095-100	Igneous	Flake	25.59	29.42	5.49	5.37
095-100	Igneous	Flake	16.60	33.18	9.47	6.35
095-100	Igneous	Debitage	34.21	21.56	8.31	4.91
095-100	Igneous	Debitage	24.50	14.00	6.79	1.94
095-100	Igneous	Debitage	33.22	27.13	17.24	9.26
095-100	Igneous	Debitage	39.69	28.60	12.61	11.66
095-100	Igneous	Debitage	30.01	21.31	12.88	6.85
095-100	Igneous	Debitage	24.41	19.72	3.38	2.09
100-105	Igneous	Flake (retouched)	38.79	50.08	13.61	16.71
100-105	Igneous	Flake	6.11	26.72	8.49	10.66
105-110	Igneous	Flake (retouched)	33.12	17.38	5.70	3.35
105-110	Igneous	Flake (retouched)	34.01	22.37	3.50	2.19
105-110	Igneous	Flake	34.94	46.20	10.09	19.44

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
105-110	Igneous	Flake	17.28	26.71	2.38	1.29
105-110	Igneous	Flake	12.99	10.00	2.82	0.36
105-110	Igneous	Flake	11.70	10.74	1.70	0.20
105-110	Igneous	Flake	31.78	42.92	10.28	13.22
105-110	Igneous	Flake	16.53	10.93	3.09	0.54
105-110	Igneous	Flake	11.71	10.48	1.73	0.29
105-110	Igneous	Flake	8.59	14.40	1.30	0.30
105-110	Igneous	Flake	14.79	8.10	3.14	0.29
105-110	Igneous	Flake	11.61	15.20	2.03	0.34
105-110	Igneous	Flake	10.46	7.12	1.52	0.16
105-110	Igneous	Flake	9.66	8.27	1.00	0.10
105-110	Igneous	Flake	9.49	9.39	1.67	0.15
105-110	Igneous	Flake	6.50	7.74	1.32	0.12
105-110	Igneous	Debitage	26.01	17.42	7.92	3.19
105-110	Igneous	Debitage	29.19	4.26	6.63	2.11
105-110	Igneous	Debitage	19.19	14.42	5.85	1.38
105-110	Igneous	Debitage	20.34	7.51	4.09	0.46
105-110	Igneous	Debitage	17.48	5.42	6.21	0.46
105-110	Igneous	Debitage	17.94	12.18	3.69	0.60
105-110	Igneous	Debitage	22.50	9.26	5.50	0.85
105-110	Igneous	Debitage	12.30	10.61	4.47	0.60
105-110	Igneous	Debitage	15.40	6.92	2.78	0.21
105-110	Igneous	Debitage	13.22	7.03	2.18	0.16
105-110	Igneous	Debitage	21.01	15.60	5.49	1.42
105-110	Igneous	Debitage	16.21	14.19	4.40	0.71
105-110	Igneous	Debitage	14.13	10.09	3.18	0.28
105-110	Igneous	Debitage	18.42	11.64	3.71	0.62
105-110	Igneous	Debitage	14.66	8.71	4.36	0.42
105-110	Igneous	Debitage	11.50	8.31	6.09	0.46
105-110	Igneous	Debitage	14.66	7.27	3.12	0.32
105-110	Igneous	Debitage	11.59	8.31	3.83	0.26
105-110	Igneous	Debitage	15.07	7.48	1.93	0.20
105-110	Igneous	Debitage	12.13	4.65	3.90	0.19
105-110	Igneous	Debitage	12.43	5.44	1.58	0.10
105-110	Igneous	Debitage	9.50	4.03	4.62	0.08
105-110	Igneous	Debitage	11.79	4.21	4.89	0.21
105-110	Igneous	Debitage	8.25	7.08	1.50	0.06
105-110	Igneous	Debitage	9.23	4.86	1.98	0.09
105-110	Igneous	Debitage	8.59	2.80	2.82	0.03

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
105-110	Igneous	Debitage	5.09	6.69	4.02	0.09
105-110	Igneous	Debitage	6.12	3.27	2.19	0.05
105-110	Igneous	Debitage	8.69	3.72	0.88	0.04
105-110	Chert (SCRI)	Debitage	18.23	12.69	2.12	0.38
105-110	Chert (SCRI)	Debitage	11.79	6.37	2.86	0.09
105-110	Chert (SCRI)	Debitage	5.71	3.20	1.49	0.03
105-110	Chert (SCRI)	Flake (retouched)	13.92	7.79	2.40	0.24
105-110	Igneous	Debitage	22.92	19.10	5.92	2.40
105-110	Chert (SCRI)	Flake	8.91	10.73	1.01	0.13
105-110	Chert (SCRI)	Flake	9.69	9.81	0.90	0.10
105-110	Chert (SCRI)	Flake	4.86	8.88	0.60	0.04
115-120	Chert (SCRI)	Debitage (heat treated)	10.99	8.39	2.21	0.16
115-120	Chert (SCRI)	Debitage (heat treated)	12.44	5.52	1.92	0.13
115-120	Chert (SCRI)	Debitage (heat treated)	9.06	4.99	1.38	0.06
115-120	Igneous	Flake	25.32	25.72	6.08	3.31
115-120	Igneous	Flake	18.99	28.37	9.42	5.92
115-120	Igneous	Flake	17.03	24.52	2.81	1.71
115-120	Igneous	Flake	15.87	10.92	0.98	0.45
115-120	Igneous	Flake	23.09	15.08	2.38	0.97
115-120	Igneous	Flake	17.49	17.31	3.08	1.25
115-120	Igneous	Flake	16.83	12.47	3.22	0.93
115-120	Igneous	Flake	11.11	13.27	2.90	0.48
115-120	Igneous	Flake	9.70	13.89	3.36	0.50
115-120	Igneous	Flake	15.74	15.39	2.88	0.65
115-120	Igneous	Flake	15.53	9.29	3.43	0.43
115-120	Igneous	Debitage	37.28	14.48	8.98	5.01
115-120	Igneous	Debitage	31.00	19.08	6.44	3.82
115-120	Igneous	Debitage	21.19	18.30	7.42	2.77
115-120	Igneous	Debitage	11.82	9.71	5.69	0.61
115-120	Igneous	Debitage	36.21	14.09	14.61	6.20
115-120	Igneous	Debitage	27.21	23.22	6.89	4.26
115-120	Igneous	Debitage	20.22	16.38	9.01	2.88
115-120	Igneous	Debitage	19.92	11.77	3.34	0.80
115-120	Igneous	Debitage	21.12	10.32	9.18	1.45
115-120	Igneous	Debitage	14.72	6.91	6.99	0.48
115-120	Igneous	Debitage	13.68	9.21	4.48	0.40
115-120	Chert (SCRI)	Flake (heat treated)	27.38	23.90	5.90	2.30
115-120	Chert (SCRI)	Flake (heat treated)	29.61	17.82	6.17	2.84
115-120	Chert (SCRI)	Flake	11.46	19.51	5.18	1.04

TABLE 23

DEBITAGE AND FLAKES FROM SCRI-849

Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	Weight (g)
115-120	Igneous	Flake (retouched)	49.02	26.71	5.99	8.03
020-025[b]	Igneous	Flake	39.82	54.42	12.24	22.19
045-050	Igneous	Flake (retouched)	31.77	35.88	6.82	8.77
045-050	Igneous	Flake	39.41	25.41	4.70	5.75
060-065	Igneous	Flake	36.23	22.79	9.08	5.61
060-065	Igneous	Debitage	38.12	26.59	6.41	5.89
065-070	Igneous	Flake	28.37	17.67	8.18	2.91
065-070	Chert (SCRI)	Flake	20.20	22.79	4.28	2.95

[a] Unit 13E, 20N
[b] Unit 14E, 20N

TABLE 24

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
SCRI-845	15E, 27N	010-015	Chert (SCRI)	Microblade (Undiagnostic)	15.41	5.72	5.01	-	0.30
SCRI-845	15E, 27N	035-040	Chert (SCRI)	Microblade (Undiagnostic)	11.39	4.50	3.11	-	0.13
SCRI-845	15E, 27N	035-040	Chert (SCRI)	Microblade (Undiagnostic)	9.61	4.81	3.42	-	0.08
SCRI-845	15E, 27N	035-040	Chert (SCRI)	Microblade (Undiagnostic)	9.59	4.62	2.20	-	0.07
SCRI-845	15E, 27N	035-040	Chert (SCRI)	Microblade (Undiagnostic)	11.10	3.99	2.80	-	0.07
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	20.82	6.12	3.12	-	0.39
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	21.70	6.75	3.89	-	0.40
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	18.21	4.42	3.69	-	0.23
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	16.53	6.14	3.66	-	0.27
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	13.22	5.70	3.01	-	0.25
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	15.96	7.14	4.17	-	0.41
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	18.03	4.80	1.70	-	0.16
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	10.35	5.02	2.90	-	0.14
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	10.30	3.91	2.60	-	0.10
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	12.87	2.83	1.79	-	0.06
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	9.69	3.39	2.11	-	0.08
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	11.18	4.20	1.89	-	0.07
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	10.00	3.90	1.20	-	0.03
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	10.58	4.69	1.48	-	0.07
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	8.00	4.99	1.98	-	0.07
SCRI-845	15E, 27N	035-040	Igneous	Microblade (Undiagnostic)	8.44	3.82	1.58	-	0.04
SCRI-845	18E, 18N	005-010	Igneous	Microblade (Undiagnostic)	13.99	6.72	2.61	1.85	0.18
SCRI-845	18E, 18N	005-010	Igneous	Microblade (Undiagnostic)	10.31	3.71	3.01	2.28	0.13
SCRI-845	18E, 18N	005-010	Igneous	Microblade (Undiagnostic)	9.21	3.88	3.81	-	0.13
SCRI-845	18E, 18N	005-010	Igneous	Microblade (Undiagnostic)	10.81	5.11	1.60	2.48	0.11
SCRI-845	18E, 18N	005-010	Igneous	Microblade (Undiagnostic)	12.65	4.79	1.81	1.52	0.08
SCRI-845	15E, 27N	040-045	Chert (SCRI)	Microblade (Undiagnostic)	9.24	2.92	1.22	-	0.03
SCRI-845	15E, 27N	040-045	Igneous	Microdrill (Undiagnostic)	18.07	4.61	2.60	-	0.25

TABLE 24

BLADES, MICROBLADES, AND MICRODRILLS

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
SCRI-845	15E, 27N	040-045	Igneous	Microdrill (Undiagnostic)	18.68	5.68	2.20	-	0.18
SCRI-845	15E, 27N	040-045	Igneous	Microdrill (Undiagnostic)	15.65	6.14	2.43	-	0.18
SCRI-845	15E, 27N	010-015	Chert (SCRI)	Microdrill bit	8.18	3.30	3.56	-	0.07
SCRI-845	15E, 27N	010-015	Chert (SCRI)	Microdrill bit	7.51	3.11	1.40	-	0.05
SCRI-845	15E, 27N	010-015	Igneous	Microblade (Undiagnostic)	8.39	4.92	3.00	-	0.12
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	21.62	5.52	2.49	2.62	0.35
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	15.51	5.81	1.99	3.39	0.47
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	14.39	7.83	2.99	3.78	0.48
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	16.89	9.30	2.88	5.59	0.67
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	18.23	7.49	3.52	3.84	0.46
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	15.29	7.80	4.90	3.51	0.47
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	13.81	12.28	4.04	4.21	0.48
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	11.90	7.41	1.28	4.13	0.32
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	11.77	5.38	1.58	1.92	0.17
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	10.68	5.90	4.02	3.13	0.20
SCRI-845	15E, 27N	055-060	Igneous	Microblade (Undiagnostic)	12.90	3.31	2.80	-	0.16
SCRI-845	15E, 27N	030-035	Igneous	Microdrill (Undiagnostic)	18.90	4.40	3.65	-	0.34
SCRI-845	18E, 18N	025-030	Chert (SCRI)	Microblade (Undiagnostic)	10.31	3.50	2.06	1.79	0.12
SCRI-845	18E, 18N	025-030	Chert (SCRI)	Microblade (Undiagnostic)	7.61	3.53	2.22	-	0.07
SCRI-845	18E, 18N	025-030	Chert (SCRI)	Microblade (Undiagnostic)	7.59	2.88	1.71	-	0.02
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	16.33	4.28	3.80	-	0.27
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	10.73	4.49	2.58	-	0.09
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	9.28	2.68	1.99	-	0.04
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	11.73	4.82	3.70	-	0.15
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	17.80	3.59	1.51	-	0.12
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	12.86	2.34	1.32	-	0.03
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	13.29	2.86	1.50	-	0.06
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Late)	8.40	3.52	3.08	-	0.07

TABLE 24

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
BLADES, MICROBLADES, AND MICRODRILLS									
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Middle)	12.43	4.83	2.48	-	0.15
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Middle)	7.49	3.98	1.22	-	0.06
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Middle)	3.70	4.92	1.21	-	0.04
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Middle)	5.00	2.90	1.29	-	0.01
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (TDR)	14.17	5.09	3.13	-	0.25
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (TDR)	14.32	4.16	3.52	-	0.27
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (TDR)	13.78	4.11	3.68	-	0.19
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Trapezoidal)	14.34	5.93	1.66	-	0.12
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Trapezoidal)	11.94	5.33	1.59	-	0.14
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Trapezoidal)	14.51	4.48	2.60	-	0.21
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Trapezoidal)	10.71	3.24	1.70	-	0.06
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Trapezoidal)	9.48	3.98	1.52	-	0.06
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Trapezoidal)	7.78	4.93	1.78	-	0.08
SCRI-849	13E, 20N	075-080	Igneous	Microblade (Late)	18.12	5.32	3.01	-	0.25
SCRI-849	13E, 20N	075-080	Igneous	Microblade (Late)	12.70	4.52	2.16	-	0.10
SCRI-845	15E, 27N	070-075	Igneous	Microblade (Undiagnostic)	17.87	11.68	3.99	6.68	1.31
SCRI-845	15E, 27N	070-075	Igneous	Microblade (Undiagnostic)	24.38	10.99	4.90	4.32	1.39
SCRI-845	18E, 19N	005-010	Igneous	Microblade (Undiagnostic)	20.23	6.97	4.00	-	0.45
SCRI-845	18E, 19N	010-015	Chert (SCRI)	Microdrill (Trapezoidal)	14.82	6.63	2.99	-	0.34
SCRI-845	18E, 18N	005-010	Chert (SCRI)	Microblade (Undiagnostic)	31.09	8.80	3.61	4.41	1.25
SCRI-845	18E, 18N	015-020	Igneous	Microblade (Undiagnostic)	21.32	5.26	3.13	-	0.31
SCRI-845	18E, 18N	020-025	Igneous	Microblade (Undiagnostic)	21.21	11.62	2.92	3.63	0.71
SCRI-845	18E, 18N	020-025	Igneous	Microblade (Undiagnostic)	19.15	7.54	2.49	3.46	0.43
SCRI-845	18E, 18N	020-025	Igneous	Microblade (Undiagnostic)	13.12	4.80	2.11	-	0.06
SCRI-845	18E, 18N	025-030	Chert (SCRI)	Microdrill bit	7.58	3.89	4.00	-	0.07
SCRI-845	18E, 18N	025-030	Chert (SCRI)	Microdrill bit	5.05	1.89	1.02	-	0.02
SCRI-849	13E, 20N	085-093	Igneous	Microdrill bit	11.63	4.51	3.20	-	0.12
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Late)	22.68	8.30	5.18	-	0.57

TABLE 24

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
BLADES, MICROBLADES, AND MICRODRILLS									
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Late)	16.72	5.21	4.02	-	0.22
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Late)	21.89	7.20	3.70	-	0.37
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Late)	11.81	3.02	2.71	-	0.09
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Late)	12.23	5.71	3.08	-	0.16
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Late)	12.99	3.93	2.69	-	0.10
SCRI-849	13E, 20N	115-120	Chert (SCRI)	Microblade (Undiagnostic)	36.73	9.92	4.76	4.00	2.20
SCRI-849	14E, 20N	060-065	Chert (SCRI)	Microdrill (TDR)	40.01	4.48	3.99	-	0.77
SCRI-849	14E, 20N	060-065	Chert (SCRI)	Microdrill (TDR)	25.08	4.21	4.59	-	0.47
SCRI-849	14E, 20N	075-080	Igneous	Microdrill (Undiagnostic)	34.00	8.71	6.00	-	1.13
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	22.63	7.42	7.28	-	0.95
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	21.33	7.89	3.69	-	0.44
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	15.80	6.69	4.40	-	0.36
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	13.83	5.90	3.50	-	0.27
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	23.02	9.79	2.89	-	0.49
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	13.13	4.61	3.88	-	0.32
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	11.37	7.29	4.59	-	0.27
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	11.01	10.63	3.48	-	0.26
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	15.23	5.50	3.51	-	0.24
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	10.59	6.32	3.83	-	0.20
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	9.73	6.32	4.41	-	0.26
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	9.33	5.11	3.80	-	0.11
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	9.82	6.51	2.63	-	0.20
SCRI-849	13E, 20N	085-093	Igneous	Microblade (Undiagnostic)	10.39	5.35	2.50	-	0.09
SCRI-849	13E, 20N	085-093	Igneous	Microdrill (Undiagnostic)	24.38	6.02	5.06	-	0.69
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microdrill (TDR)	13.08	4.78	2.62	-	0.15
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microdrill (Trapezoidal)	11.93	6.58	2.21	-	0.17
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microdrill (Trapezoidal)	12.54	5.30	1.89	-	0.11
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microdrill (Trapezoidal)	6.58	2.61	0.67	-	0.00

TABLE 24

BLADES, MICROBLADES, AND MICRODRILLS									
Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microblade (Undiagnostic)	27.15	7.89	4.31	-	0.94
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microblade (Undiagnostic)	26.18	8.36	4.17	-	0.90
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microblade (Undiagnostic)	21.61	7.92	3.93	-	0.58
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microblade (Undiagnostic)	8.42	5.42	1.71	-	0.08
SCRI-849	13E, 20N	085-093	Chert (SCRI)	Microblade (Undiagnostic)	8.92	8.28	2.61	-	0.18
SCRI-845	18E, 18N	020-025	Igneous	Microdrill (Trapezoidal)	16.18	6.12	2.66	-	0.13
SCRI-845	18E, 18N	035-040	Chert (SCRI)	Microdrill bit	4.43	3.51	2.98	-	0.03
SCRI-849	13E, 20N	115-120	Chert (SCRI)	Microdrill bit	9.01	4.02	2.62	-	0.18
SCRI-849	13E, 20N	115-120	Igneous	Microblade (Undiagnostic)	10.48	8.91	3.50	-	0.30
SCRI-849	13E, 20N	115-120	Igneous	Microblade (Undiagnostic)	10.21	9.28	3.22	-	0.23
SCRI-849	13E, 20N	115-120	Igneous	Microblade (Undiagnostic)	11.60	8.09	2.99	-	0.23
SCRI-849	13E, 20N	115-120	Igneous	Microdrill bit	10.92	3.21	2.08	-	0.13
SCRI-845	15E, 27N	035-040	Chert (SCRI)	Microblade (Late)	10.29	5.26	2.33	-	0.14
SCRI-845	15E, 27N	035-040	Chert (SCRI)	Microblade (Late)	11.69	4.89	2.90	-	0.11
SCRI-845	18E, 18N	025-030	Igneous	Microdrill (Undiagnostic)	21.59	6.28	3.00	-	0.27
SCRI-845	18E, 18N	025-030	Igneous	Microdrill (Undiagnostic)	12.79	5.09	3.20	-	0.22
SCRI-845	18E, 18N	025-030	Igneous	Microdrill (Undiagnostic)	13.39	5.35	3.83	-	0.18
SCRI-845	18E, 18N	025-030	Igneous	Microdrill (Undiagnostic)	9.99	3.92	1.70	-	0.09
SCRI-845	18E, 18N	025-030	Igneous	Microblade (Undiagnostic)	8.18	6.59	1.90	-	0.11
SCRI-845	18E, 18N	025-030	Igneous	Microblade (Undiagnostic)	11.19	5.16	2.21	-	0.09
SCRI-845	18E, 18N	025-030	Igneous	Microblade (Undiagnostic)	9.19	6.99	2.41	-	0.14
SCRI-845	18E, 18N	025-030	Igneous	Microblade (Undiagnostic)	9.25	3.25	2.11	-	0.07
SCRI-845	18E, 18N	025-030	Igneous	Microblade (Undiagnostic)	7.76	3.01	2.00	-	0.05
SCRI-845	18E, 18N	025-030	Igneous	Microblade (Undiagnostic)	5.52	3.11	1.12	-	0.01
SCRI-845	18E, 18N	020-025	Igneous	Microdrill (Undiagnostic)	28.20	7.30	4.09	-	0.70
SCRI-845	18E, 18N	020-025	Igneous	Microdrill (Undiagnostic)	5.21	6.58	3.79	-	0.29
SCRI-845	18E, 18N	020-025	Chert (SCRI)	Microdrill bit	5.82	3.70	2.62	-	0.00
SCRI-845	18E, 18N	020-025	Chert (SCRI)	Microblade (Undiagnostic)	12.81	5.40	1.61	2.01	0.13

TABLE 24

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
BLADES, MICROBLADES, AND MICRODRILLS									
SCRI-845	18E, 18N	020-025	Chert (SCRI)	Microblade (Undiagnostic)	9.79	4.32	2.40	-	0.07
SCRI-845	18E, 18N	020-025	Chert (SCRI)	Microblade (Undiagnostic)	12.10	5.40	1.51	-	0.10
SCRI-845	18E, 18N	020-025	Chert (SCRI)	Microblade (Undiagnostic)	10.61	4.39	0.92	-	0.07
SCRI-849	13E, 20N	115-120	Igneous	Microdrill (Undiagnostic)	14.08	6.79	3.59	-	0.30
SCRI-849	13E, 20N	115-120	Igneous	Microdrill (Undiagnostic)	13.38	4.78	3.10	-	0.17
SCRI-849	13E, 20N	115-120	Igneous	Microdrill (Undiagnostic)	11.31	5.58	3.74	-	0.23
SCRI-845	18E, 19N	015-020	Chert (SCRI)	Microblade (Undiagnostic)	13.69	6.99	5.18	-	0.44
SCRI-845	18E, 19N	015-020	Chert (SCRI)	Microblade (Undiagnostic)	14.71	4.48	2.98	-	0.15
SCRI-845	18E, 19N	015-020	Chert (SCRI)	Microblade (Undiagnostic)	1.74	2.50	1.32	-	0.03
SCRI-845	18E, 19N	015-020	Chert (SCRI)	Microblade (Undiagnostic)	13.92	6.00	4.09	-	0.25
SCRI-845	18E, 19N	015-020	Chert (SCRI)	Microblade (Undiagnostic)	14.21	6.30	2.08	-	0.23
SCRI-845	18E, 19N	015-020	Chert (SCRI)	Microblade (Undiagnostic)	13.54	4.81	0.79	1.41	0.08
SCRI-845	18E, 19N	015-020	Chert (SCRI)	Microblade (Undiagnostic)	9.61	4.05	1.87	-	0.08
SCRI-845	18E, 19N	015-020	Igneous	Microblade (Undiagnostic)	13.93	6.07	3.31	-	0.22
SCRI-845	18E, 19N	015-020	Igneous	Microblade (Undiagnostic)	16.30	5.51	1.98	-	0.23
SCRI-845	18E, 19N	015-020	Igneous	Microblade (Undiagnostic)	12.01	3.59	1.99	-	0.10
SCRI-845	18E, 19N	015-020	Igneous	Microblade (Undiagnostic)	10.81	4.18	2.51	-	0.10
SCRI-845	18E, 19N	015-020	Igneous	Microblade (Undiagnostic)	10.41	4.62	2.82	-	0.10
SCRI-845	18E, 19N	015-020	Igneous	Microblade (Undiagnostic)	9.10	3.21	1.47	-	0.03
SCRI-845	18E, 19N	015-020	Igneous	Microblade (Undiagnostic)	7.21	3.20	1.81	-	0.05
SCRI-845	15E, 27N	030-035	Chert (SCRI)	Microblade (Undiagnostic)	11.52	5.71	1.47	1.20	0.12
SCRI-845	15E, 27N	030-035	Igneous	Microblade (Undiagnostic)	14.58	6.37	1.65	2.11	0.22
SCRI-845	15E, 27N	030-035	Igneous	Microblade (Undiagnostic)	11.30	5.92	2.09	1.90	0.14
SCRI-845	15E, 27N	030-035	Igneous	Microblade (Undiagnostic)	15.00	6.99	1.52	-	0.13
SCRI-845	15E, 27N	035-040	Igneous	Microdrill (Trapezoidal)	8.92	6.25	2.42	-	0.12
SCRI-845	15E, 27N	035-040	Chert (SCRI)	Microdrill bit	6.74	4.09	1.59	-	0.05
SCRI-845	15E, 27N	040-045	Chert (SCRI)	Microblade (Middle)	6.17	5.83	1.61	-	0.14
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	13.98	8.21	2.20	-	0.23

TABLE 24

BLADES, MICROBLADES, AND MICRODRILLS

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	10.30	5.81	1.48	-	0.10
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	10.12	4.99	3.20	-	0.11
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	8.52	7.40	2.31	-	0.15
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	12.49	3.30	2.01	-	0.07
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	7.89	6.10	3.00	-	0.12
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	7.20	4.89	3.28	-	0.10
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	8.60	5.61	3.72	-	0.18
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	9.29	4.69	1.91	-	0.09
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	9.09	3.92	3.00	-	0.07
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	8.02	2.39	2.24	-	0.05
SCRI-845	15E, 27N	040-045	Igneous	Microblade (Undiagnostic)	5.91	2.09	1.51	-	0.00
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	18.59	9.40	2.64	-	0.58
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	11.98	5.73	3.53	-	0.22
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	11.22	4.92	3.58	-	0.22
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	10.62	9.42	2.82	-	0.26
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	9.01	6.31	3.11	-	0.18
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	14.79	5.24	4.40	-	0.34
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	14.10	4.79	4.53	-	0.36
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	10.31	8.72	3.64	-	0.24
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	11.40	3.28	2.71	-	0.08
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	9.62	5.89	4.18	-	0.26
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	9.69	5.49	3.22	-	0.14
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	12.30	4.59	2.82	-	0.12
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	11.19	4.92	2.00	-	0.10
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	12.40	9.44	5.77	-	0.46
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	9.41	4.89	2.40	-	0.09
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	7.49	10.09	3.30	-	0.26
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	7.82	7.11	3.41	-	0.08

TABLE 24

BLADES, MICROBLADES, AND MICRODRILLS

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	6.24	4.48	2.59	-	0.15
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Undiagnostic)	8.12	3.48	1.75	-	0.04
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	7.99	4.31	1.20	-	0.06
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	5.63	8.35	1.31	-	0.02
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	7.69	5.69	1.52	-	0.05
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	11.34	5.59	2.26	-	0.08
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	6.72	5.79	1.38	-	0.03
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	7.30	3.23	1.28	-	0.04
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	5.28	2.69	1.98	-	0.03
SCRI-845	15E, 27N	045-050	Chert (SCRI)	Microblade (Undiagnostic)	7.21	3.38	1.11	-	0.02
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Middle)	16.02	7.50	2.61	-	0.36
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Middle)	11.98	7.29	2.21	-	0.21
SCRI-845	15E, 27N	045-050	Igneous	Microblade (Middle)	10.79	4.82	1.75	-	0.08
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microblade (Undiagnostic)	10.98	3.92	1.35	-	0.07
SCRI-845	15E, 27N	045-050	Igneous	Microdrill bit	5.39	6.32	3.02	-	0.07
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Undiagnostic)	15.02	5.83	4.42	-	0.38
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Undiagnostic)	12.01	5.46	1.83	-	0.14
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Undiagnostic)	17.42	6.00	4.28	-	0.27
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Undiagnostic)	12.78	4.99	2.30	-	0.12
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Undiagnostic)	15.59	6.52	2.10	-	0.19
SCRI-849	13E, 20N	075-080	Chert (SCRI)	Microdrill (Undiagnostic)	12.53	4.40	3.50	-	0.18
SCRI-845	15E, 27N	050-055	Igneous	Microdrill (Undiagnostic)	8.48	9.20	3.18	-	0.21
SCRI-845	15E, 27N	050-055	Igneous	Microdrill (Undiagnostic)	10.30	4.89	1.74	-	0.07
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	16.90	7.19	4.91	-	0.61
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	12.89	5.80	3.49	-	0.30
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	15.62	5.03	2.77	-	0.20
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	10.99	4.71	2.94	-	0.13
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	9.37	6.49	3.09	-	0.16

TABLE 24

BLADES, MICROBLADES, AND MICRODRILLS

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	13.74	8.78	4.80	-	0.39
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	12.98	4.82	3.20	-	0.18
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	13.84	5.40	4.09	-	0.24
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	10.50	4.02	2.18	-	0.08
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	7.38	4.10	2.30	-	0.05
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	6.42	5.12	1.92	-	0.06
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	9.03	4.68	1.71	-	0.06
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	10.62	5.28	1.72	-	0.09
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	10.10	4.50	2.23	-	0.07
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Undiagnostic)	30.03	5.72	2.40	-	0.35
SCRI-845	15E, 27N	050-055	Igneous	Microblade (Middle)	8.20	5.29	1.20	-	0.02
SCRI-845	15E, 27N	050-055	Chert (SCRI)	Microblade (Middle)	13.40	5.31	1.49	-	0.12
SCRI-845	15E, 27N	050-055	Chert (SCRI)	Microblade (Middle)	12.70	9.18	2.69	-	0.45
SCRI-845	15E, 27N	050-055	Chert (SCRI)	Microblade (Undiagnostic)	6.81	2.80	1.24	-	0.01
SCRI-845	15E, 27N	050-055	Chert (SCRI)	Microblade (Undiagnostic)	9.40	6.76	2.30	-	0.15
SCRI-845	15E, 27N	055-060	Chert (SCRI)	Microblade (Undiagnostic)	9.42	4.58	0.91	0.79	0.05
SCRI-845	15E, 27N	055-060	Chert (SCRI)	Microblade (Undiagnostic)	7.03	3.39	1.52	-	0.05
SCRI-845	15E, 27N	055-060	Igneous	Microdrill (Undiagnostic)	15.18	6.19	4.64	-	0.50
SCRI-845	15E, 27N	060-065	Igneous	Microblade (Undiagnostic)	18.28	8.38	4.08	-	0.51
SCRI-845	15E, 27N	060-065	Igneous	Microblade (Undiagnostic)	15.93	8.10	4.39	-	0.43
SCRI-845	15E, 27N	060-065	Igneous	Microblade (Undiagnostic)	14.50	6.42	3.03	-	0.25
SCRI-845	15E, 27N	060-065	Chert (SCRI)	Microdrill bit	7.26	3.13	1.31	-	0.02
SCRI-849	13E, 20N	075-080	Igneous	Microdrill (Undiagnostic)	18.30	7.03	5.52	-	0.55
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Undiagnostic)	16.34	7.58	3.52	-	0.31
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Undiagnostic)	15.42	6.92	5.41	-	0.56
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Undiagnostic)	11.72	6.80	2.73	-	0.21
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Undiagnostic)	8.82	6.62	3.92	-	0.15
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Undiagnostic)	10.00	3.70	2.41	-	0.11

TABLE 24

BLADES, MICROBLADES, AND MICRODRILLS

Site	Unit	Depth (cm)	Material	Item	L (mm)	W (mm)	T (mm)	T (bulb) (mm)	Weight (g)
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Middle)	12.42	5.22	1.98	-	0.10
SCRI-849	13E, 20N	105-110	Chert (SCRI)	Microblade (Undiagnostic)	7.41	3.56	2.51	-	0.05
SCRI-849	13E, 20N	105-110	Chert (SCRI)	Microblade (Undiagnostic)	5.34	3.23	2.20	-	0.01
SCRI-849	13E, 20N	105-110	Igneous	Microdrill (Undiagnostic)	14.68	8.31	3.72	-	0.22
SCRI-849	13E, 20N	105-110	Igneous	Microdrill (Undiagnostic)	15.91	8.20	3.20	-	0.29
SCRI-849	13E, 20N	105-110	Igneous	Microdrill (Undiagnostic)	10.09	6.49	2.08	-	0.10
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Late)	9.11	2.78	2.42	-	0.06
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Late)	7.51	2.72	1.89	-	0.04
SCRI-849	13E, 20N	105-110	Igneous	Microblade (Late)	8.21	2.52	1.62	-	0.02

.

TABLE 25

WORKED BONE

Site	Unit	Depth (cm)	Taxon	Item	Count	Weight (g)
SCRI-845	15E, 27N	010-015	Mammal	Gorge/barb	2	0.43
SCRI-845	15E, 27N	025-030	Aves	Whistle	1	1.02
SCRI-845	15E, 27N	025-030	Mammal	Gorge/barb	1	0.98
SCRI-845	15E, 27N	035-040	Mammal	Gorge/barb	3	0.36
SCRI-845	18E, 18N	025-030	Fish	Gorge/barb	8	3.15
SCRI-845	18E, 18N	025-030	Mammal	Gorge/barb	2	2.82
SCRI-845	18E, 18N	030-035	Mammal	Gorge/barb	1	2.42
SCRI-845	18E, 18N	035-040	Mammal	Gorge/barb	1	1.35
SCRI-849	13E, 20N	085-093	Mammal	Gorge/barb	1	0.27
SCRI-849	13E, 20N	115-120	Unidentified	Gorge/barb	6	1.62

.

TABLE 26

MIDDEN PER LEVEL FROM AUGERS

Site	Unit	Depth (cm)	Assemblage[a]	Weight (g)
SCRI-843	1S	010-020	M	142.53
SCRI-843	2S	020-030	M	701.50
SCRI-843	2S	030-040	M	483.84
SCRI-843	2S	040-050	M	223.70
SCRI-843	3S	015-020	M	67.43
SCRI-843	3S	020-030	M	63.36
SCRI-845	1E	000-010	M	383.07
SCRI-845	1E	010-020	M	189.14
SCRI-845	1S	000-010	M	263.02
SCRI-845	1S	010-020	M	103.89
SCRI-845	1S	020-030	M	0.00
SCRI-845	2E	000-010	M	227.69
SCRI-845	2E	010-020	M	285.20
SCRI-845	2E	020-030	M	380.80
SCRI-845	2E	030-040	M	412.42
SCRI-845	2S	000-010	M	325.74
SCRI-845	2S	010-020	M	135.73
SCRI-845	3S	000-010	M	292.05
SCRI-845	3S	010-020	M	389.79
SCRI-845	3S	020-030	M	287.71
SCRI-845	3S	030-040	M	125.68
SCRI-845	4S	000-010	M	717.71
SCRI-845	4S	010-020	M	516.99
SCRI-845	4S	020-030	M	565.16
SCRI-845	4S	030-040	M	584.01
SCRI-845	4S	040-050	M	885.30
SCRI-845	4S	050-060	M	771.30
SCRI-845	4S	060-070	M	567.02
SCRI-845	4S	070-080	M	1787.40
SCRI-845	4S	080-090	M	909.40
SCRI-845	4S	090-100	M	597.44
SCRI-845	4S	100-110	M	595.68
SCRI-848	2E	010-020	M	176.04
SCRI-848	2E	020-027	M	215.45
SCRI-848	3E	000-010	M	62.37
SCRI-848	2E	010-020	M	367.73
SCRI-849	1E	000-010	Mixed[b]	34.47
SCRI-849	1E	010-017	Mixed[b]	45.41
SCRI-849	2E	000-010	Mixed[b]	517.77

TABLE 26

MIDDEN PER LEVEL FROM AUGERS

Site	Unit	Depth (cm)	Assemblage[a]	Weight (g)
SCRI-849	2E	030-040	Mixed[b]	391.50
SCRI-849	3E	000-010	L	312.02
SCRI-849	3E	010-020	Mixed[b]	308.21
SCRI-849	3E	020-030	T/L	341.36
SCRI-849	3E	030-040	L	284.46
SCRI-849	3E	040-050	Mixed[b]	548.21
SCRI-849	3E	050-065	Mixed[b]	1006.50
SCRI-849	3E	065-070	Mixed[b]	333.66
SCRI-849	3E	070-080	Mixed[b]	725.14
SCRI-849	3E	080-090	M	547.53
SCRI-851	1	000-025	M	378.75
SCRI-851	2	000-010	M	256.97
SCRI-851	2	010-020	M	303.18
SCRI-851	2	020-030	M	396.51
SCRI-851	2	030-040	M	350.67
SCRI-851	2	040-050	M	333.95
SCRI-851	2	050-060	M	396.52
SCRI-851	2	060-070	M	242.44
SCRI-851	2	070-080	M	381.63
SCRI-851	2	080-090	M	769.60
SCRI-851	2	090-095	M	504.96

.
[a] M=Middle, T=Transitional, L=Late, H=Historic
[b] These proveniences contain material eroded from multiple deposits at SCRI-849, but lack diagnostic artifacts to distinguish them by period

TABLE 27

MIDDEN PER LEVEL FROM EXCAVATION

Site	Unit	Depth (cm)	Assemblage[a]	Weight (g)
SCRI-845	15E, 27N	010-015	M	3216.30
SCRI-845	15E, 27N	030-035	M	13092.30
SCRI-845	15E, 27N	035-040	M	21293.80
SCRI-845	15E, 27N	040-045	M	12588.10
SCRI-845	15E, 27N	045-050	M	21482.70
SCRI-845	15E, 27N	050-055	M	16758.10
SCRI-845	15E, 27N	055-060	M	20374.50
SCRI-845	15E, 27N	060-065	M	11717.40
SCRI-845	18E, 18N	005-010	M	5097.10
SCRI-845	18E, 18N	020-025	M	8188.90
SCRI-845	18E, 18N	025-030	M	9041.00
SCRI-845	18E, 18N	035-040	M	3022.70
SCRI-845	18E, 19N	015-020	M	12387.48
SCRI-849	13E, 20N	075-080[b]	M/T/L	18625.35
SCRI-849	13E, 20N	085-093	M/T	18834.00
SCRI-849	13E, 20N	095-100	M	15491.79
SCRI-849	13E, 20N	105-110	M	9053.70
SCRI-849	13E, 20N	115-120	M	14453.00

[a] M=Middle, T=Transitional, L=Late

[b] This material comes from above the secure context capped by the collapse layer, and likely represents a mixed/redeposited context based on the presence of drills and beads diagnostic of the Middle, Transitional, and Late periods

TABLE 28

BARNACLES PER LEVEL FROM AUGERS						
			ACORN BARNACLES (VAR.)		*POLLICIPES POLYMERUS*	
Site	Unit	Depth (cm)	Count[a]	Weight (g)	Count	Weight (g)
SCRI-843	1S	010-020	62	2.79	1	0.03
SCRI-843	2S	020-030	223	15.12	3	0.51
SCRI-843	2S	030-040	284	12.90	1	0.02
SCRI-843	2S	040-050	143	8.05	3	0.19
SCRI-843	3S	015-020	50	2.11	1	0.12
SCRI-843	3S	020-030	49	3.31	2	0.27
SCRI-845	1E	000-010	-	16.48	-	-
SCRI-845	1E	010-020	-	10.44	-	-
SCRI-845	1S	000-010	-	5.85	-	-
SCRI-845	1S	010-020	-	1.90	-	-
SCRI-845	1S	020-030	-	1.31	-	-
SCRI-845	2E	000-010	-	4.08	-	-
SCRI-845	2E	010-020	-	8.01	-	-
SCRI-845	2E	020-030	-	10.62	-	-
SCRI-845	2E	030-040	-	9.75	-	-
SCRI-845	2S	000-010	-	6.95	-	-
SCRI-845	2S	010-020	-	3.54	-	-
SCRI-845	3S	000-010	-	3.90	-	-
SCRI-845	3S	010-020	-	6.97	-	-
SCRI-845	3S	020-030	-	3.84	-	-
SCRI-845	3S	030-040	-	1.22	-	-
SCRI-845	3S	040-050	-	0.47	-	-
SCRI-845	4S	000-010	-	9.87	-	-
SCRI-845	4S	010-020	-	7.17	-	-
SCRI-845	4S	020-030	-	14.41	-	-
SCRI-845	4S	030-040	-	7.84	-	-
SCRI-845	4S	040-050	-	17.52	-	-
SCRI-845	4S	050-060	-	16.02	-	-
SCRI-845	4S	060-070	-	10.87	-	-
SCRI-845	4S	070-080	-	36.01	-	-
SCRI-845	4S	080-090	-	22.61	-	-
SCRI-845	4S	090-100	-	10.46	-	-
SCRI-845	4S	100-110	-	13.45	-	-
SCRI-848	2E	010-020	72	7.45	3	0.13
SCRI-848	2E	020-027	41	2.72	2	0.06
SCRI-848	3E	000-010	11	0.85	1	0.10
SCRI-848	3E	010-020	120	13.86	5	0.84
SCRI-849	1E	000-010	-	0.86	-	-

TABLE 28

BARNACLES PER LEVEL FROM AUGERS

			ACORN BARNACLES (VAR.)		*POLLICIPES POLYMERUS*	
Site	Unit	Depth (cm)	Count[a]	Weight (g)	Count	Weight (g)
SCRI-849	1E	010-017	-	0.86	-	-
SCRI-849	2E	000-010	-	4.34	-	-
SCRI-849	2E	030-040	-	3.45	-	-
SCRI-849	3E	000-010	65	3.73	-	-
SCRI-849	3E	010-020	-	4.36	-	-
SCRI-849	3E	020-030	98	5.35	-	-
SCRI-849	3E	030-040	-	5.51	-	-
SCRI-849	3E	040-050	120	8.03	-	-
SCRI-849	3E	050-065	-	12.62	-	-
SCRI-849	3E	065-070	110	5.95	-	-
SCRI-849	3E	070-080	-	10.75	-	-
SCRI-849	3E	080-090	250	16.78	-	-
SCRI-851	1	000-025	-	9.97	-	-
SCRI-851	2	000-010	-	6.64	-	-
SCRI-851	2	010-020	-	3.85	-	-
SCRI-851	2	020-030	-	4.79	-	-
SCRI-851	2	030-040	-	5.09	-	-
SCRI-851	2	040-050	-	4.27	-	-
SCRI-851	2	050-060	-	4.89	-	-
SCRI-851	2	060-070	-	3.20	-	-
SCRI-851	2	070-080	-	2.80	-	-
SCRI-851	2	080-090	-	7.77	-	-
SCRI-851	2	090-095	-	6.64	-	-

[a] Counts only available for limited numbers of auger levels due to change in sorting procedure partway through analysis

TABLE 29

Barnacles per level from Excavation						
			Acorn barnacles (var.)		*Pollicipes polymerus*	
Site	Unit	Depth (cm)	Count[a]	Weight (g)	Count	Weight (g)
SCRI-845	15E, 27N	010-015	1192	59.84	*	*
SCRI-845	15E, 27N	030-035	-	315.82	*	*
SCRI-845	15E, 27N	035-040	15390	509.58	*	*
SCRI-845	15E, 27N	040-045	7344	316.96	*	*
SCRI-845	15E, 27N	045-050	16936	529.75	*	*
SCRI-845	15E, 27N	050-055	13200	459.94	*	*
SCRI-845	15E, 27N	055-060	8519	490.28	*	*
SCRI-845	15E, 27N	060-065	9200	349.27	*	*
SCRI-845	18E, 18N	005-010	2976	90.88	*	*
SCRI-845	18E, 18N	020-025	5320	201.38	*	*
SCRI-845	18E, 18N	025-030	8088	261.25	*	*
SCRI-845	18E, 18N	035-040	1816	83.88	*	*
SCRI-845	18E, 19N	015-020	10295	313.42	*	*
SCRI-849	13E, 20N	075-080	28256	507.48	4	0.24
SCRI-849	13E, 20N	085-093	1655	436.91	73	5.25
SCRI-849	13E, 20N	095-100	8034	457.35	2189	70.21
SCRI-849	13E, 20N	105-110	30336	361.15	129	11.82
SCRI-849	13E, 20N	115-120	20240	867.45	441	60.67

[a] Counts only available for limited numbers of auger levels due to change in sorting procedure partway through analysis
[*] Totals not recorded for SCRI-845

TABLE 30

STRONGYLOCENTROTUS SPP. PER LEVEL FROM AUGERS

Site	Unit	Depth (cm)	Count[a]	Weight (g)
SCRI-843	1S	010-020	2	0.02
SCRI-843	2S	020-030	7	0.21
SCRI-843	2S	030-040	5	0.06
SCRI-843	2S	040-050	2	0.06
SCRI-843	3S	015-020	4	0.08
SCRI-843	3S	020-030	2	0.01
SCRI-845	1E	000-010	10	0.24
SCRI-845	1E	010-020	9	0.17
SCRI-845	1S	000-010	10	0.24
SCRI-845	1S	010-020	7	0.10
SCRI-845	1S	020-030	2	0.06
SCRI-845	2E	000-010	4	0.12
SCRI-845	2E	010-020	20	0.37
SCRI-845	2E	020-030	20	0.48
SCRI-845	2E	030-040	19	0.52
SCRI-845	2S	000-010	71	1.31
SCRI-845	2S	010-020	16	0.31
SCRI-845	3S	000-010	18	0.44
SCRI-845	3S	010-020	5	0.12
SCRI-845	3S	020-030	2	0.07
SCRI-845	3S	040-050	1	0.03
SCRI-845	4S	000-010	32	0.76
SCRI-845	4S	010-020	35	0.93
SCRI-845	4S	020-030	41	0.91
SCRI-845	4S	030-040	7	0.14
SCRI-845	4S	040-050	19	0.44
SCRI-845	4S	050-060	5	0.11
SCRI-845	4S	060-070	10	0.23
SCRI-845	4S	070-080	54	1.35
SCRI-845	4S	080-090	27	0.66
SCRI-845	4S	090-100	12	0.25
SCRI-845	4S	100-110	17	0.31
SCRI-848	3E	010-020	6	0.21
SCRI-849	1E	000-010	10	0.14
SCRI-849	1E	010-017	9	0.20
SCRI-849	2E	000-010	27	0.42
SCRI-849	2E	030-040	57	0.81
SCRI-849	3E	000-010	21	0.53
SCRI-849	3E	010-020	14	0.37

TABLE 30

STRONGYLOCENTROTUS SPP. PER LEVEL FROM AUGERS

Site	Unit	Depth (cm)	Count[a]	Weight (g)
SCRI-849	3E	020-030	17	0.42
SCRI-849	3E	030-040	9	0.37
SCRI-849	3E	040-050	41	0.86
SCRI-849	3E	050-065	53	1.16
SCRI-849	3E	065-070	35	0.78
SCRI-849	3E	070-080	35	1.03
SCRI-849	3E	080-090	65	2.17
SCRI-851	2	000-010	17	0.35
SCRI-851	2	010-020	9	0.27
SCRI-851	2	020-030	38	1.77

[a] Counts only available for limited numbers of auger levels due to change in sorting procedure partway through analysis

TABLE 31

STRONGYLOCENTROTUS SPP. PER LEVEL FROM EXCAVATION

Site	Unit	Depth (cm)	Count	Weight (g)
SCRI-845	15E, 27N	010-015	237	4.58
SCRI-845	15E, 27N	030-035	1650	41.91
SCRI-845	15E, 27N	035-040	4732	72.84
SCRI-845	15E, 27N	040-045	1970	36.91
SCRI-845	15E, 27N	045-050	3036	42.79
SCRI-845	15E, 27N	050-055	2680	43.92
SCRI-845	15E, 27N	055-060	8640	108.04
SCRI-845	15E, 27N	060-065	4356	88.03
SCRI-845	15E, 27N	065-070	1	3.11
SCRI-845	18E, 18N	005-010	736	9.22
SCRI-845	18E, 18N	020-025	642	10.21
SCRI-845	18E, 18N	025-030	306	14.00
SCRI-845	18E, 18N	035-040	78	1.90
SCRI-845	18E, 19N	015-020	2908	51.76
SCRI-849	13E, 20N	075-080	10752	139.69
SCRI-849	13E, 20N	085-093	3608	73.79
SCRI-849	13E, 20N	095-100	4185	50.70
SCRI-849	13E, 20N	105-110	1104	26.50
SCRI-849	13E, 20N	115-120	2041	50.05

TABLE 32

HALIOTIS SPP. PER LEVEL FROM AUGERS

Site	Unit	Depth (cm)	Material	Count	Weight (g)
SCRI-843	1S	010-020	*H. cracherodii*	2	0.33
SCRI-843	2S	020-030	*H. cracherodii*	1	0.33
SCRI-843	2S	030-040	*H. cracherodii*	1	0.49
SCRI-843	2S	040-050	*Haliotis sp.*	1	0.85
SCRI-843	3S	020-030	*H. cracherodii*	2	1.67
SCRI-843	3S	020-030	*Haliotis sp.*	1	5.23
SCRI-845	1S	000-010	*H. cracherodii*	1	3.70
SCRI-845	1S	020-030	*H. cracherodii*	1	0.41
SCRI-845	2E	020-030	*H. cracherodii*	1	0.70
SCRI-845	2E	030-040	*H. cracherodii*	1	0.98
SCRI-845	2S	000-010	*H. cracherodii*	3	2.16
SCRI-845	2S	010-020	*H. cracherodii*	2	0.80
SCRI-845	3S	000-010	*H. cracherodii*	2	2.10
SCRI-845	3S	010-020	*H. cracherodii*	1	0.26
SCRI-845	3S	030-040	*H. cracherodii*	2	2.40
SCRI-845	4S	010-020	*H. cracherodii*	2	36.53
SCRI-845	4S	020-030	*H. cracherodii*	1	2.40
SCRI-845	4S	040-050	*H. cracherodii*	11	7.63
SCRI-845	4S	070-080	*H. cracherodii*	2	1.21
SCRI-845	4S	070-080	*H. rufescens*	1	0.91
SCRI-845	4S	080-090	*H. cracherodii*	4	4.32
SCRI-845	4S	090-100	*H. cracherodii*	1	2.44
SCRI-845	4S	100-110	*H. cracherodii*	1	0.23
SCRI-848	2E	020-027	*H. cracherodii*	1	0.31
SCRI-848	3E	010-020	*H. cracherodii*	2	0.38
SCRI-849	1E	000-010	*H. cracherodii*	1	106.55
SCRI-849	3E	020-030	*H. cracherodii*	8	9.24
SCRI-849	3E	030-040	*H. cracherodii*	2	3.17
SCRI-849	3E	040-050	*H. cracherodii*	1	2.34
SCRI-849	3E	050-065	*H. cracherodii*	1	1.87

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TABLE 33

HALIOTIS SPP. PER LEVEL FROM EXCAVATION

Site	Unit	Depth (cm)	Material	Count	Weight (g)
SCRI-845	15E, 27N	010-015	*H. cracherodii*	7	7.14
SCRI-845	15E, 27N	010-015	*H. cracherodii*	10	29.95
SCRI-845	15E, 27N	025-030	*H. rufescens*	1	4.15
SCRI-845	15E, 27N	030-035	*H. cracherodii*	90	204.77
SCRI-845	15E, 27N	030-035	*H. rufescens*	1	0.43
SCRI-845	15E, 27N	030-035	*H. rufescens*	7	15.65
SCRI-845	15E, 27N	035-040	*H. cracherodii*	69	87.03
SCRI-845	15E, 27N	040-045	*H. cracherodii*	22	29.66
SCRI-845	15E, 27N	045-050	*H. cracherodii*	35	79.19
SCRI-845	15E, 27N	045-050	*H. rufescens*	1	2.09
SCRI-845	15E, 27N	050-055	*H. cracherodii*	26	29.65
SCRI-845	15E, 27N	055-060	*H. cracherodii*	54	129.72
SCRI-845	15E, 27N	060-065	*H. cracherodii*	24	35.57
SCRI-845	18E, 18N	005-010	*H. cracherodii*	26	17.96
SCRI-845	18E, 18N	020-025	*H. cracherodii*	16	10.40
SCRI-845	18E, 18N	025-030	*H. cracherodii*	36	24.45
SCRI-845	18E, 18N	025-030	*H. rufescens*	1	0.67
SCRI-845	18E, 18N	035-040	*H. cracherodii*	5	4.52
SCRI-845	18E, 19N	015-020	*H. cracherodii*	32	24.44
SCRI-849	13E, 20N	010-015	*H. cracherodii*	1	35.37
SCRI-849	13E, 20N	010-015	*H. cracherodii*	1	41.29
SCRI-849	13E, 20N	015-020	*H. cracherodii*	1	26.55
SCRI-849	13E, 20N	015-020	*H. cracherodii*	1	53.29
SCRI-849	13E, 20N	050-055	*H. cracherodii*	6	20.77
SCRI-849	13E, 20N	075-080	*H. cracherodii*	11	17.81
SCRI-849	13E, 20N	075-080	*H. rufescens*	1	0.54
SCRI-849	13E, 20N	085-093	*H. cracherodii*	12	53.09
SCRI-849	13E, 20N	095-100	*H. cracherodii*	118	37.76
SCRI-849	13E, 20N	095-100	*H. rufescens*	8	3.03
SCRI-849	13E, 20N	105-110	*H. cracherodii*	37	71.17
SCRI-849	13E, 20N	115-120	*H. cracherodii*	31	39.53
SCRI-849	13E, 20N	155-165	*H. cracherodii*	4	90.59
SCRI-849	14E, 20N	085-090	*H. cracherodii*	80	33.13

TABLE 34

WHOLE HALIOTIS SPP.

Site	Unit	Depth (cm)	Material	Count	Weight (g)
SCRI-845	15E, 27N	020-025	*H. rufescens*	1	7.94
SCRI-845	15E, 27N	035-040	*H. cracherodii*	1	17.66
SCRI-845	15E, 27N	035-040	*H. cracherodii*	1	35.60
SCRI-845	15E, 27N	045-050	*H. cracherodii*	1	34.83
SCRI-845	15E, 27N	055-060	*H. cracherodii*	1	71.31
SCRI-845	18E, 18N	035-040	*H. cracherodii**	1	100.73
SCRI-849	13E, 20N	035-040	*H. cracherodii**	1	17.53
SCRI-849	13E, 20N	035-040	*H. cracherodii**	1	31.43
SCRI-849	13E, 20N	035-040	*H. cracherodii**	1	45.25
SCRI-849	13E, 20N	035-040	*H. cracherodii**	1	74.26
SCRI-849	13E, 20N	035-040	*H. cracherodii**	1	118.68
SCRI-849	13E, 20N	045-050	*H. cracherodii*	3	222.98
SCRI-849	13E, 20N	050-055	*H. cracherodii*	7	165.64
SCRI-849	14E, 20N	040-045	*H. cracherodii*	2	84.18
SCRI-849	14E, 20N	040-045	*H. rufescens*	1	83.19
SCRI-845	15E, 27N	020-025	*H. rufescens*	1	7.94
SCRI-845	15E, 27N	035-040	*H. cracherodii*	1	17.66

.
* Recovered in situ during excavation

TABLE 35

OTHER IDENTIFIED (UNWORKED) SHELL PER LEVEL FROM AUGERS

			Chiton (var.)		Limpets (var.)		*Megastraea undosa*		*Septifer bifurcatus*		*Tegula funebralis*		*Tivela stultorum*		*Crab (var.)*	
Site (SCRI)	Unit	Depth (cm)	#	W (g)	#	W (g)	#	W (g)	#	W (g)	#	W (g)	#	W (g)	#	W (g)
843	1S	010-020	1	0.01	-	-	-	-	-	-	-	-	-	-	-	-
843	2S	020-030	4	0.55	3	0.06	-	-	6	0.33	2	0.33	-	-	-	-
843	2S	030-040	1	0.25	2	0.02	-	-	-	-	5	0.90	-	-	-	-
843	2S	040-050	-	-	3	0.04	-	-	1	0.05	-	-	-	-	-	-
843	3S	015-020	-	-	1	0.01	-	-	-	-	-	-	2	0.94	-	-
843	3S	020-030	-	-	-	-	-	-	-	-	-	-	-	-	2	0.05
845	1E	000-010	-	-	4	0.09	1	0.07	-	-	-	-	-	-	1	0.09
845	1E	010-020	-	-	2	0.05	1	0.11	-	-	-	-	-	-	1	0.02
845	2E	000-010	1	0.13	3	0.15	-	-	-	-	-	-	-	-	-	-
845	2E	010-020	1	0.03	-	-	1	0.08	-	-	-	-	-	-	-	-
845	2E	020-030	1	0.10	4	0.13	1	2.31	-	-	-	-	-	-	1	0.07
845	2E	030-040	-	-	2	0.08	-	-	-	-	2	0.18	-	-	-	-
845	2S	000-010	1	0.18	3	0.58	-	-	-	-	-	-	-	-	-	-
845	2S	010-020	-	-	-	-	2	2.54	-	-	-	-	-	-	-	-
845	3S	000-010	-	-	1	0.05	-	-	-	-	-	-	-	-	2	0.32
845	3S	010-020	-	-	3	0.12	-	-	-	-	3	0.59				
845	3S	020-030	-	-	2	0.14	1	0.61	-	-	1	0.48	-	-	-	-
845	3S	030-040	-	-	1	0.03	-	-	-	-	1	0.11	1	1.89	-	-
845	3S	040-050	1	0.08	-	-	-	-	-	-	-	-	-	-	-	-
845	4S	000-010	-	-	6	0.15	-	-	-	-	-	-	-	-	1	0.08
845	4S	010-020	-	-	5	0.21	-	-	-	-	-	-	-	-	2	0.12
845	4S	020-030	-	-	4	0.27	-	-	-	-	-	-	1	0.93	-	-
845	4S	030-040	2	1.07	2	0.08	-	-	-	-	-	-	-	-	-	-
845	4S	040-050	2	0.25	5	0.15	-	-	-	-	-	-	-	-	-	-
845	4S	050-060	-	-	4	0.09	-	-	-	-	-	-	-	-	-	-

TABLE 35

OTHER IDENTIFIED (UNWORKED) SHELL PER LEVEL FROM AUGERS

			Chiton (var.)		Limpets (var.)		*Megastraea undosa*		*Septifer bifurcatus*		*Tegula funebralis*		*Tivela stultorum*		*Crab (var.)*	
Site (SCRI)	Unit	Depth (cm)	#	W (g)	#	W (g)	#	W (g)	#	W (g)	#	W (g)	#	W (g)	#	W (g)
845	4S	060-070	-	-	6	0.15	-	-	-	-	-	-	-	-	-	-
845	4S	070-080	-	-	12	0.23	-	-	-	-	-	-	-	-	-	-
845	4S	080-090	-	-	4	0.11	-	-	-	-	-	-	-	-	3	0.24
845	4S	090-100	1	0.05	1	0.04	-	-	-	-	-	-	-	-	2	0.35
845	4S	100-110	2	0.24	1	0.08	-	-	-	-	-	-	-	-	1	0.10
848	2E	020-027	-	-	1	0.02	-	-	-	-	-	-	-	-	-	-
848	3E	000-010	1	0.09	-	-	-	-	-	-	-	-	-	-	-	-
848	3E	010-020	-	-	3	0.12	-	-	2	0.36	-	-	-	-	1	0.12
849	1E	010-017	1	0.12	-	-	-	-	-	-	-	-	-	-	1	0.01
849	2E	000-010	-	-	-	-	-	-	-	-	-	-	-	-	1	0.28
849	2E	030-040	2	0.25	-	-	-	-	-	-	-	-	-	-	-	-
849	3E	000-010	-	-	2	0.09	-	-	-	-	-	-	-	-	-	-
849	3E	010-020	1	0.17	5	0.16	-	-	-	-	1	0.24	-	-	-	-
849	3E	020-030	2	0.38	6	0.15	-	-	-	-	2	0.19	-	-	-	-
849	3E	030-040	-	-	3	0.12	-	-	-	-	-	-	-	-	-	-
849	3E	040-050	3	1.01	9	0.93	-	-	-	-	-	-	-	-	1	0.23
849	3E	050-065	2	0.39	8	0.33	-	-	-	-	-	-	-	-	1	0.51
849	3E	065-070	1	0.24	5	0.17	-	-	-	-	1	0.11	-	-	-	-
849	3E	070-080	3	0.31	10	0.59	-	-	1	1.96	-	-	-	-	1	0.06
849	3E	080-090	6	1.00	6	0.60	-	-	-	-	-	-	-	-	1	0.05
851	2	040-050	-	-	1	0.13	-	-	-	-	-	-	-	-	-	-

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TABLE 36A

OTHER IDENTIFIED (UNWORKED) SHELL PER LEVEL FROM EXCAVATION

Site (SCRI)	Unit	Depth (cm)	Chiton (var.) #	Chiton (var.) W (g)	Limpets (var.) #	Limpets (var.) W (g)	*Megastraea undosa* #	*Megastraea undosa* W (g)	*Septifer bifurcatus* #	*Septifer bifurcatus* W (g)	*Tegula funebralis* #	*Tegula funebralis* W (g)	*Tivela stultorum* #	*Tivela stultorum* W (g)
845	15E, 27N	010-015	3	0.37	24	0.61	-	-	-	-	5	0.51	1	0.93
845	15E, 27N	030-035	-	-	-	-	-	-	24	1.42	15	5.17	1	0.01
845	15E, 27N	035-040	44	6.13	308	8.21	-	-	11	2.47	50	11.90	-	-
845	15E, 27N	040-045	17	2.46	211	5.60	-	-	42	2.84	10	1.65	-	-
845	15E, 27N	045-050	16	2.20	305	8.97	-	-	4	4.30	15	10.48	1	0.13
845	15E, 27N	050-055	-	-	205	6.18	-	-	36	2.94	4	1.82	-	-
845	15E, 27N	055-060	22	3.02	261	6.97	1	1.70	11	2.05	6	1.03	-	-
845	15E, 27N	060-065	12	0.94	137	3.88	-	-	17	0.62	8	1.90	-	-
845	18E, 18N	005-010	15	2.27	24	0.75	-	-	3	0.19	-	-	-	-
845	18E, 18N	020-025	8	1.51	92	3.49	-	-	23	6.48	1	0.51	-	-
845	18E, 18N	025-030	21	1.80	203	5.49	2	6.64	45	2.50	4	1.37	-	-
845	18E, 18N	035-040	6	0.57	64	1.87	1	7.18	1	0.16	-	-	-	-
845	18E, 19N	015-020	15	4.29	134	6.23	26	0.95	-	-	11	2.56	-	-
849	13E, 20N	075-080	15	3.04	202	7.18	-	-	15	1.60	1	0.08	1	0.43
849	13E, 20N	085-093	48	7.45	297	11.38	-	-	67	7.98	3	0.91	-	-
849	13E, 20N	095-100	89	16.48	415	17.07	-	-	278	9.84	1	0.59	-	-
849	13E, 20N	105-110	30	7.37	324	10.55	-	-	69	5.55	4	0.54	-	-
849	13E, 20N	115-120	64	15.47	469	20.66	-	-	146	8.91	5	2.21	-	-

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TABLE 36B

OTHER IDENTIFIED (UNWORKED) SHELL PER LEVEL FROM EXCAVATION

			Norrisia norrisii		*Ostrea sp.*		*Pseudochama exogyra*		*Megathura crenulata*		Crab (var.)	
Site (SCRI)	Unit	Depth (cm)	#	W (g)	#	W (g)	#	W (g)	#	W (g)	#	W (g)
845	15E, 27N	010-015	2	8.38	-	-	-	-	-	-	2	2.20
845	15E, 27N	035-040	-	-	1	1.01	-	-	-	-	15	1.91
845	15E, 27N	040-045	-	-	-	-	-	-	-	-	3	1.38
845	15E, 27N	045-050	1	1.32	-	-	-	-	-	-	6	0.87
845	15E, 27N	055-060	-	-	-	-	-	-	-	-	7	0.34
845	15E, 27N	060-065	-	-	-	-	-	-	-	-	7	0.82
845	18E, 18N	005-010	-	-	-	-	-	-	-	-	1	0.02
845	18E, 18N	020-025	1	0.41	-	-	-	-	-	-	2	10.00
845	18E, 18N	025-030	1	0.14	1	0.06	-	-	-	-	23	1.55
845	18E, 18N	035-040	-	-	-	-	-	-	-	-	1	0.08
845	18E, 19N	015-020	1	0.54	-	-	-	-	-	-	14	1.38
849	13E, 20N	035-040	-	-	-	-	1	1.71	-	-	-	-
849	13E, 20N	075-080	1	5.41	-	-	-	-	-	-	20	1.47
849	13E, 20N	085-093	-	-	1	3.04	-	-	-	-	29	3.24
849	13E, 20N	095-100	-	-	3	3.54	-	-	-	-	73	0.80
849	13E, 20N	115-120	-	-	3	3.78	-	-	-	-	7	0.33
849	13E, 20N	150-155	-	-	-	-	-	-	3	5.33	62	7.09

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TABLE 37

EXCAVATED DEPTHS AND VOLUMES FROM SITES IN THIS STUDY

Site (SCRI)	Unit	Sample type [a]	Max. depth (cm)	Excavated volume (L)
843	1S	Auger	30	6.43
843	2S	Auger	65	13.93
843	3S	Auger	30	6.43
843	4S	Auger	80	17.14
843	5S	Auger	40	8.57
843	All	All	-	52.50
844	1S	Auger	92	19.29
844	2S	Auger	50	10.72
844	1E	Auger	28	6.00
844	2E	Auger	40	8.57
844	3E	Auger	60	12.86
844	All	All	-	57.44
845	1S	Auger	30	6.43
845	2S	Auger	30	6.43
845	3S	Auger	50	10.72
845	4S	Auger	110	23.58
845	1E	Auger	30	6.43
845	2E	Auger	48	10.29
845	15E, 27N	Excavation	80	800
845	18E, 18N	Excavation	40	400
845	18E, 19N	Excavation	20	200
845	All	All	-	1463.88
848	1S	Auger	20	4.29
848	2S	Auger	40	8.57
848	3S	Auger	20	4.29
848	1E	Auger	10	2.14
848	2E	Auger	27	5.79
848	3E	Auger	30	6.43
848	4E	Auger	30	6.43
848	All	All	-	37.94
849	1E	Auger	17	3.64
849	2E	Auger	44	9.43
849	3E	Auger	160	34.29
849	4E	Auger	83	17.79
849	13E, 20N	Excavation	190	1900
849	14E, 20N	Excavation	100	1000
849	CS	Column sample	164	65.50
849	All	All	-	3030.65
851	1	Auger	25	5.36
851	2	Auger	95	20.36
851	All	All	-	25.72

[a] The three types of samples shown here were of the following dimensions: augers (with a diameter of 8.26cm) had an area of $314cm^2$; column samples were 20cm x 20cm; excavations were 1m x 1m.

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