CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

Contextualizing *'Aqnipis:*

An Archaeological Approach to Identifying Basket Production Locales in South Central California

A thesis submitted in partial fulfillment of the requirements

For the degree of Master of Arts in Anthropology, Public Archaeology

By

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Dedication

For my parents, Dane and Terri Hill.

Thank you for showing me the value of hard work and the importance of following through on any endeavor I undertake.

I promise to stop talking about my thesis now.

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Abstract

Contextualizing *'Aqnipis:* An Archaeological Approach to Identifying Basket Production Locales in South Central California

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The organization of production for coiled baskets, or *'aqnipis* as they have been called by the Chumash, is not well understood in California archaeology. In this context, organization refers to the scheduling and location of manufacture within the craft production system. In this thesis, I seek to determine if the stages of coiled basket manufacture can be observed in the archaeological record, and if so, to identify the distribution of production locales across the cultural landscape. To accomplish this, a predictive model for basket production organization in California hunter-gatherer groups was developed. As a means to evaluate the model, four distinct archaeological sites in the Emigdiano Chumash territory were analyzed to identify evidence for the different stages of coiled basket manufacture. The basket production assemblages at each site were contextualized within regional site use strategies to identify patterns of organization. Results suggest that evidence for basket production can be observed in the archaeological record. Interpreted through the lens of taskscape, it appears that women scheduled the different stages of basket production around primary subsistence tasks that occurred at different locations throughout the seasonal round, engaging in basket manufacture across the cultural landscape.

CHAPTER 1: INTRODUCTION

> *After this he led the women to a spring to dig roots [for basketweaving]. He took out the roots, peeled them, split them, and spread them out on the ground. Then he brought out some willow shoots, split them, and commenced a basket. When he was starting to weave the upright part he called one of the women. "This is what you women will do!" he said, and he gave the basket he had commenced to the woman he had called. That woman started weaving right away. Then the others they too started digging for roots, peeling them and drying them in the sun by the side of the willow shoots they had gathered.*
>
> -Excerpt from the Eastern Pomo Creation Story (Luthin 2002: 289).

Baskets are an important part of Native California culture. A good deal is known about who made baskets, how baskets were produced, what they were used for, and why they were important in the past, from the knowledge of contemporary traditional practitioners, ethnographic literature and the archaeological record (Dean et al. 2004; Dozier 2000; Farmer 2010; Hollimon 1990; Hudson and Blackburn 1987). However, we have yet to identify when and where baskets were made prior to the arrival of Europeans. Identifying the timing and location of basket manufacturing situates production in the landscape and integrates the social and economic facets of basketry into other aspects of traditional lifeways.

The poor preservation of organic materials has caused the integral position fiber technologies held in the lives of Native California groups to often be overlooked in the archaeological record (Dozier 2000). Subsequently, study of the manufacture of baskets has been impacted. The general lack of preservation of such artifacts and the absence of an obvious tool kit used in the production of these objects poses a challenge to researchers (Anderson 1999; Hector 2006; Jolie and McBrinn 2010). Ethnographic evidence from numerous California tribes suggest that the work of producing baskets has

traditionally, but not exclusively, been the responsibility of women (Anderson 2005; Hollimon 1990; Hudson and Blackburn 1987; Latta 1977). In the past, the activities of women in prehistory have also been underrepresented in archaeological research (Conkey and Spector 1984; Costin 2013; Dozier 2000; Gero and Conkey 1991).

The purpose of this study is to ascertain if basket production can be identified in the archaeological record and determine if there are differences in where baskets were produced across the landscape. To accomplish this, a predictive model for basket production organization was developed. In addition to contributing a more nuanced interpretation of site use patterns, identifying the location of production is directly linked to the timing or scheduling of production, key aspects of the organization of production (Costin 2005). Therefore, this project, by identifying patterned locations of production, can potentially observe the way women in the past organized the production of baskets. This research incorporates prehistoric Native California women in a discussion of economics that extends beyond the milling feature.

The southern foothills of the San Joaquin Valley, home to the Emigdiano Chumash, hold a tangible archeological record that provides an excellent setting for the investigation of basketry. In the form of a case study, this project takes a regional approach to investigate coiled basket production patterns within the Emigdiano Chumash territory. This culture area was selected because recent archaeological investigations at numerous sites in the region have made the exploration of this topic possible and necessary for understanding observed site distribution patterns and use across the landscape. The regional approach to this study is accomplished by examining four different sites that represent three distinct site types likely used at different points in the

traditional Chumash seasonal settlement pattern. These sites are: *Tashlipun* (CA-KER-188H), a village located at the base of the foothills; Pond (CA-KER-1635) and Three Springs (CA-KER-3388), two seasonal milling camps located at higher elevations in the foothills; and Cache Cave (CA-KER- 10419), an upland cave site which exhibits a wide variety of specialized and utilitarian perishable and nonperishable components. My analysis focuses on the artifact collections generated from previous fieldwork at these sites, excavated as part of the ongoing Enculturating Environments Project led by David Robinson and Julie Bernard (Robinson et al. 2008, 2012, 2015) as well as part of Bernard's dissertation research (Bernard 2008).

Coiled basketry, referred to by the Chumash as *'aqnipis* (Hudson and Blackburn 1987:226), was the main type used in a wide variety of household, economic, religious, recreational, and personal activities. Coiled basket production requires four main phases that each potentially have distinct archaeological signatures, making it an ideal form of perishable technology to study for production patterns. Put simply, these stages are harvesting, processing, storing [raw materials], and weaving. To identify locations where the engendered production of coiled baskets took place in the past, each stage of production was reviewed for types of physical evidence that might remain in the archaeological record. Following this, each archaeological site assemblage was examined for the types and amounts of basket production evidence at each stage of manufacture.

Multiple lines of evidence are incorporated to assess each site's likeliness for being used in the production of baskets at each stage. Harvesting locations may exhibit evidence that plants used in basketry can grow in the area at present or were used at a site in the past. Harvesting locales will also likely show evidence of occupation or use around

the time of year when basketry plants need to be tended or harvested. These avenues are explored by examining current environmental settings, paleoenvironmental data, and site use seasonality.

Processing plants to turn them into useable weaving materials also has an archaeological signature, because the tools used to turn plants into weaving materials are much more durable than the plants or baskets themselves. Expedient, morphologically ambiguous, shell or flake tools, mentioned in ethnographic accounts, used to cut, trim, and scrape clean selected plants may exhibit usewear indicative of these activities. Initial identification of the presence or absence of utilized shell or flake tools was necessary. Then experimental usewear production and comparative usewear analysis of the archaeological tools that could have been used to manufacture sewing fibers were used to infer if a site may have been a production locale. Other plant processing methods, discussed later, also have the potential to leave an archaeological signature and were also considered.

Identifying the ephemeral stage of storing harvested or processed materials is challenging. However, identifying site features that might provide the cool dry conditions needed to store materials is one way to incorporate this stage into archaeological analysis. Evidence for the final stages of basketry production can be observed through the presence or absence of diagnostic artifacts related to weaving or tarring coiled basketry.

In this project, identifying the organization of basket production is conducted using the conceptual frameworks of preindustrial craft production patterns, hunter-gatherer settlement mobility, and landscape archaeology, which incorporated concepts of taskscape, and gendered craft production. These concepts were synthesized with regional

settlement patterns and information on stages of basket manufacture to develop the predictive model for basket production organization. Before evaluating basketry production organization, it was important to understand the different elements of craft production in preindustrial society. Knowing how the different aspects of production intersect and what parts of production signify in economic, political, and social terms is necessary to assess the component parts of past basket production. An understanding of traditional Chumash settlement patterns was also needed to anticipate how people used different site types and at what times of year sites would likely have been occupied. The multiple steps of coiled basket production do not occur in rapid succession and may have been undertaken in different locations because each stage requires different resource and has distinct physical and social constraints. Ingold's concept of taskscape (1993) is a useful tool to evaluate coiled basket manufacture by stage, as it incorporates the physical and social variability of the landscape in understanding production processes. The engendered nature of coiled basket production is an important social aspect which likely influenced when and where different stages of manufacture occurred. Because of the gendered aspect of coiled basket manufacture, theories on gendered craft production and gendered taskscapes were also reviewed.

This thesis is organized into eight chapters, briefly outlined below. Chapter 2 provides the natural and cultural background for the Chumash and the San Emigdio region. Covered in this chapter are the environmental settings in which the project is located, as well as a review of ethnographic and archaeological data on both general Chumash society and the interior Emigdiano Chumash. Chapter 3 provides a literature review of work that has been done on basket production in Southern California. Notably,

this chapter provides a summary of previous archaeological investigations and a detailed review of ethnographic information on basket production, with an emphasis on coiled basketry. This includes a discussion of stages of basket production, types basketry plant materials used, strategies for harvesting and processing plant materials, methods for weaving a basket, and ethnographic information regarding where women may have made baskets in the past.

Chapter 4 discusses the theoretical framework of this research and outlines the approaches used to identify the organization of basket production. This chapter includes a review of literature on craft production systems, hunter-gatherer mobility and settlement patterns, landscape archaeology, taskscapes, and the organization of hunter-gatherer craft production. Finally, a review of interior Chumash settlement patterns is presented and a model for Emigdiano Chumash basket production organization is outlined. Drawing on theoretical frameworks, archaeological data, and ethnographic information, this predictive model estimate where harvesting, processing, storing, and weaving may have occurred in the past.

Chapter 5 lays out my methodological approaches to addressing the question of basket production organization. Methods discussed include lithic analysis, microwear analysis, and experimental archaeology. This is followed by a presentation of the methods specifically used in this study including experimental usewear production and analysis, archaeological usewear analysis, and incorporation and assessment of paleobotanical data and additional artifacts associated with different stages of basket production. Chapter 6 presents a description of the sites incorporated in this study, focusing on site setting, excavation methods, paleobotanical data, and lithic data

generated from the excavated assemblages. Chapter 7 presents the results of the experimental usewear program and analysis of the archaeological assemblages. The archaeological results include the paleobotanical information, usewear analysis, and a discussion of the remainder of the relevant artifacts and features observed at each site. Chapter 8 provides a discussion of the results, comparing them with the model presented in Chapter 4. This chapter finishes with some concluding remarks about the outcome of the results.

CHAPTER 2: ENVIRONMENTAL AND CULTURAL BACKGROUND

Environmental Setting

This project incorporates several archaeological sites located on the Wild Lands Conservancy's Wind Wolves Preserve. At 93,000 acres, Wind Wolves is California's largest non-profit preserve, established for the purpose of protecting earth's biodiversity and sharing the beauty and knowledge nature has to offer (Wildlands Conservancy 2017). The preserve is located in the southern foothills of the San Joaquin Valley. Known as the San Emigdio Mountains (Figure 2-1), this geologic formation comprises a portion of the east/west Transverse Range that connects the north/south running Temblor Range in the west, with the Tehachapi Range to the east.

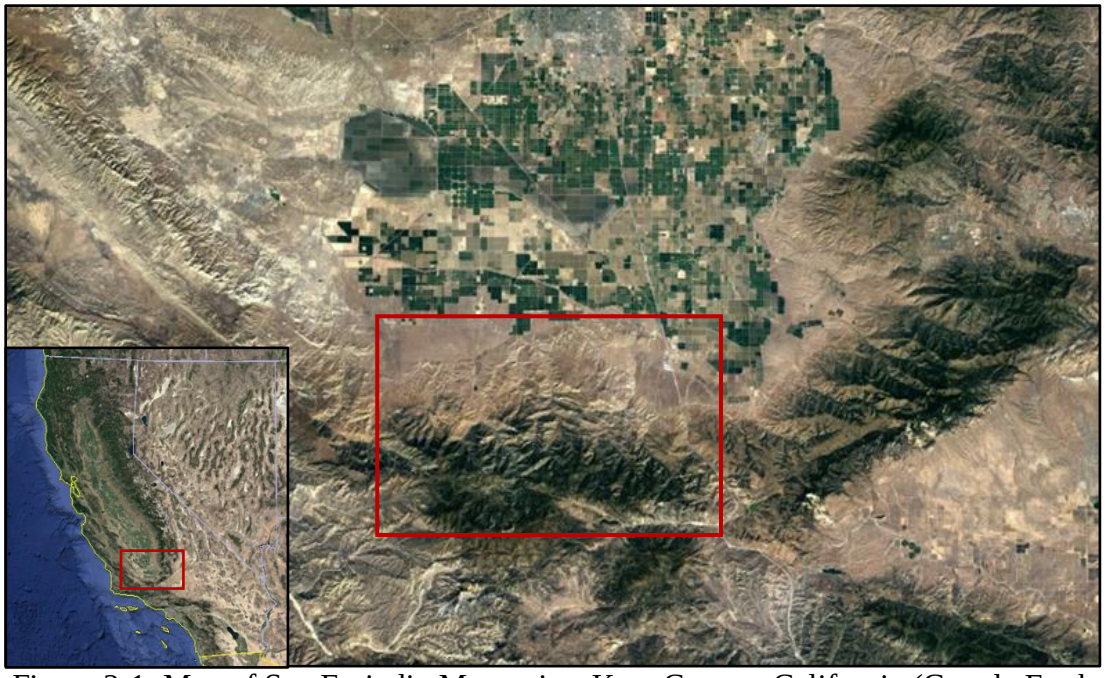

Figure 2-1: Map of San Emigdio Mountains, Kern County, California (Google Earth Image: Landsat/Copernicus).

The San Emigdio Mountains range from between 800 to 1,500 feet near the valley floor, to over 7,000 feet in elevation at the highest peaks (Nilsen 1987). The formation

was created by tectonic uplifting that has subsequently been cut by short north trending drainages, whose waters eroded deep canyons into the hills before being absorbed quickly into the Southern San Joaquin Valley (Figure 2-2) (Robinson 2013; Horne 1981:20). Archaeological sites incorporated in this study are situated between San Emigdio Canyon to the west and Pleito Creek to the east.

Figure 2-2: View of San Emigdio Canyon (view to south).

Following a pattern similar to the rest of mountainous Southern California, the interior Chumash region exhibits wet cold winters with frequent rains and hot dry summers with limited fresh water resources. Low, near freezing, temperatures at higher elevations in the winter months prohibit prolonged human occupation, limiting known Chumash settlements to no higher than around 3,300 feet. Summers exhibit temperatures that regularly reach over 100 degrees Fahrenheit with water restricted to numerous

springs distributed across the landscape and a few creeks that contain perineal water from snow melt runoff. San Emigdio creek generally flows year-round, fed by creeks higher up in the mountains to the south (Bernard 2008:239).

The diversity in the geology of the landscape and climate is reflected in the regional biodiversity. Though slightly arid, the range of plants and animals that inhabit this area provided abundant resources for traditional food ways and other economic pursuits (Robinson 2013). Though historic ranching and agricultural activities have impacted the ecological makeup of the San Emigdio Hills, much of the landscape remains intact, due to private ownership through time and the efforts of the preserve to rehabilitate the area to its natural state (Bernard 2008). At lower elevations, the preserve encompasses annual and perennial grassland and chaparral environments, and at higher elevations an oak woodland environment. This is interspersed along waterways and near springs by riparian environments. Common vegetation observed in the area includes multiple oak species, pinyon and other pines, juniper, willow, cottonwood, giant rye, juncus, tule, sedges, various bunch grasses, seasonal wildflowers, sage, buckwheat, elderberry, three-leaved sumac, poison oak, and more (Wildlands Conservancy 2016a).

Animals commonly found in the project area include the American black bear, coyote, an array of foxes, mule deer, tule elk, bobcat, mountain lion, several squirrel species, opossum, ring tail and northern raccoon, and many species of bats and rabbits. Wide varieties of birds also frequent the preserve, including the several species of quail, many types of water fowl, hawks, falcons, eagles, owls, woodpeckers, flycatchers, hummingbirds, blackbirds and more. The California condor migratory route also passes through the preserve. Amphibians and reptiles are present in the area as well and include

numerous frogs and toads, western fence lizards, and many types of snakes including king snakes, gopher snakes, and the northern pacific rattlesnake (Wildlands Conservancy 2016b).

These plant and animal communities were respected and used by the Emigdiano Chumash to support the health and livelihoods of the communities living in the interior. In addition to living resources, the interior Chumash made use of many geologic resources that were locally available as well as acquired from distant areas. Some locally available sandstone and conglomerate outcrops were used for milling features and as canvases for pictographs (Robinson 2007). Cobbles of granite, sandstone, and other materials were used as manos, pestles, and portable milling equipment. Local basalt and quartzite were used for many types of flake and cobble tools. Several lithic tool stone types were used by the Emigdiano people to make projectile points, knives, drills, and all number of modified and utilized flake tools. Although some rhyolite and chert of undetermined origin may have been collected nearby, the majority of the tool stone used in biface production appears to be imported. Materials include Temblor chert, obsidian, fused shale, Monterey chert, and Franciscan chert. Fused shale, Franciscan and Temblor chert sources are located approximately 70 kilometers away from the study area. Monterey chert outcrops about 135 kilometers from the San Emigdio Hills and the Coso Volcanic Field is around 170 kilometers east of this area (Arnold 2011; McRae 1999; Sutton and Des Lauriers 2002).

Cultural Setting

In this dynamic interior landscape, the environmental setting combines with the influence of other nearby cultural groups, such as the Yokuts, Kawaiisu, and the

Tubatulabal, to create a unique local Emigdiano Chumash history that is not yet well understood. Ethnographic data concerning traditional lifeways for the Emigdiano region is remarkably scant, likely due to the historical contexts of colonization in the region as well as the rugged and dynamic physical geography (Bernard 2008). However, archaeological investigation of this area has increased over the last decade and a better understanding of the prehistory is beginning to emerge.

Information gathered by various ethnographers working with nearby groups provides a baseline of data for what one might expect to observe in the cultural practices of the Emigdiano Chumash. These other culture groups have much fuller ethnographic accounts than the Emigdiano Chumash because of their prolonged and direct contact with Spanish, Mexican and American colonizers. Information on social, political, and economic patterns known for other Chumash groups provides a framework for how we expect the interior Chumash to have organized themselves. Such socioeconomic background is needed to make inferences about the influences guiding basketry production patterns on a local Emigdiano scale.

Further, ethnographic and ethnohistoric accounts from nearby groups mentioned above can provide relevant supplemental information about certain subsistence and technology based aspects of the Emigdiano Chumash because the environments and resources used would have been comparable. This is important for making inferences about the types of tools and types of plants used to make basketry in the Emigdiano Hills. Below is a general discussion of Chumash culture and lifeways known from ethnographic, historic, and archaeological work. This is followed by a more specific discussion of known Emigdiano Chumash data. It is important to note that early

documentation may have inherent biases and incomplete data, that ethnographic accounts reflect traditions that were passed down but likely modified through time as people adapted to the influence of colonization, and that archaeological data is always interpreted though our current lenses.

Chumash Culture

To say that a lot of archaeological work has been conducted on Chumash society is an understatement. As Bernard (2008) highlights, over 1,000 publications regarding Chumash culture have been completed to date. Ranging from archaeology, linguistics, ethnology, and beyond, this extensive body of literature has primarily focused on island and coastal groups (Arnold 1992; Arnold et al. 1997; Bernard 2008:31; Gamble 2005; Gamble 2008; Hollimon 1990; Johnson 1988; King 1981; Perry 2003; Raab 1996; Raab and Larson 1997; Sassaman 2004). The Chumash culture area, defined by the distribution of people speaking linguistically related Hokan dialects, spans from San Luis Obispo in the north down to Malibu in the south, and as far eastward as the Cuyama Valley and Castic Lake (Robinson 2007:188) (Figure 2-3). This broad area incorporates island, coastal, inland and interior environments, with a wide range of ecosystems spread across beaches, mountains, plains, and valleys. The region of California encompassed by the Chumash culture area has a long history of occupation that extends as far back as 11,500 years, with uninterrupted occupation of the area by the Chumash and their ancestors starting as early as 9,000 ago (Gamble 2008:37).

Figure 2-3. Map of Chumash Culture Area (Grant 1978a:506)

Just prior to contact, the Chumash practiced a hunting, fishing, and plant gathering based economy. The political, ideological, and social structure of this chiefdom society was elaborate, interconnected, and dynamic (Gamble 2008). The earliest documented European interactions with the Chumash occurred in 1542 on the Juan Rodriguez Cabrillo Expedition, in 1602 during the voyage of Sebastian Vizcaino, and in 1769 during the Gaspar de Portola expedition (Gamble 2008:38-40). It is estimated that at the time, approximately 20,000 people, speaking at least six distinct languages in the Hokan language family inhabited what is today referred to as the Chumash culture area (Bernard 2008:31). Encompassing an expansive and diverse geographic area, the Chumash were politically and socially connected through familial ties, regional polities, shared religious practices and beliefs, and robust networks of exchange.

Chumash Social, Political, and Economic Organization

Prior to contact with the Spanish, the Chumash were organized around familial clans that tended to trace their lineage through matrilineal descent and often practiced matrilocal residency patterns after marriage (Gamble 2008:55). Beyond clans, Chumash society was organized at the village and supra-village level. Villages maintained political autonomy but were linked through marriages between members of different villages (Hollimon 1990:34). Location and connection played a vital role in social organization of villages. Hollimon states "A village's importance was a function of its place in intraregional exchange (local redistribution), and its interregional exchange (long distance trade). Environmental variation and geographic location played a major role in the pattern of social interaction, underpinning Chumash social organization as a whole" (Hollimon 1990:30). It is important to note here that location in relation to resources was an important factor in the function of a village. Along the coast, villages were permanent and occupied year-round (Gamble 2008), while in the interior, groups practiced a more semi-sedentary lifestyle, occupying villages only part of the year (Mikkelsen et al. 2014a). The relative sedentism of the people living at a village can be seen as a reflection of both the physical resources located in close proximity, as well as the social and political status of a place.

In Chumash social organization, an individual's social status was partially ascribed from birth and social ranks included chief, elite, and commoner. Highly ranked individuals had special rights and it has been suggested that the Chumash had a wealth based class system at the time of contact (Gamble 2008:55). The role of chief, or *wot*, was an inherited position that operated mainly at the village level (Gamble 2008: 62).

Along with chiefs, the *'antap* society was an important elite element of the Chumash social system. The *'antap* consisted of religious specialists who performed the ritual ceremonies for public events and worked at a provincial level, overseeing religious affairs as well as other aspects of social life (Hollimon 1990:30). Members were initiated in childhood and a large shell bead fee was required for entrance into this elite society (Gamble 2008:56-57).

The '*antap* were not the only types of specialists recognized by the Chumash. Others included "canoe owner, fisherman, hunter, undertaker, leather or flint worker, and the makers of cordage, beads, tobacco, nets, baskets, bows, arrows, bowls, boards, mortars, and headdresses" (Hollimon 1990:32). In the late prehistoric and historic period, many roles overlapped and individuals could engage in several important economic, political and religious roles (Hollimon 1990:32).

Directly associated with the hereditary and hierarchical political system, the Chumash had a well-developed economy based on monetized shell bead currency and the regulated exchange of other high value natural resources and specialized crafts. The island, coastal, and inland environments provided distinct resources that were incorporated into intra and interregional exchange networks (Gamble 2008:60; Horne 1981; Timbrook 2008). It appears that there was likely ritual and free market exchange going on, both of which were connected to the power of Chumash chiefs (Gamble 2008:60).

Chumash Daily Life

Though overriding organizational structures are important to understand, it is from the aggregate assemblages of daily lives lived that we gather this information

archaeologically. Every day economic and social practices reflect the larger patterns in political, economic, and religious structures. Along with archaeological assemblages, mortuary evidence and the observations of some of the earliest European colonizers provide some insight into the traditional daily lives of Chumash people.

A good indicator of the types of activities people engaged in regularly are those observed in the physical layout of the village. Although their layouts varied somewhat by region, settlement size, and level of sedentism, villages commonly contained dance grounds, sacred enclosures (*siliyks)*, cemeteries, playing fields, menstrual huts, childbirth huts, male puberty huts, storage structures, smokehouses, and sweat lodges, along with houses, windbreaks and other outdoor work areas (Gamble 2008). Economic activities documented historically at Chumash villages included processing and cooking foods, storing food, fishing, and making baskets (Gamble 2008:149).

At the household level, gender functioned as a defining element in many economic and subsistence practices, and structured social roles within familial units (Hollimon 1990:58). There is also evidence of age being an important structuring factor for work and for family life (Hollimon 1990:89). Social roles were variable and fluid, and could be ascribed, inherited, or earned. It has been noted in California tribes, women were the primary producers of household items (Hollimon 1990:70), though many productive tasks were engaged in equally by all genders in society, such as house building and making clothes (Hollimon 1990:73). Generally, women were responsible for gathering and processing of plants for food and basket production and men have been documented as the primary participants in fishing, hunting, butchering, and the production of related tools (Hollimon 1990:67).

While all members of society participated in some form of domestic production at the household level, specialized craft production in Chumash society was limited to shell beads and chert microdrills produced on the Northern Channel Islands and plank canoes, or *tomols*, made on the mainland coast (Arnold 1987; Arnold and Bernard 2005). Gamble notes that there is limited evidence for the type of extensive specialized craft production at mainland villages observed on the Northern Channel Islands (2008:149). Some evidence is present for specialized Monterey chert biface production near Vandenberg, and at Pitas Point there are a large number of tarring pebbles which may indicate intensive water bottle production, possibly for export (Gamble 2008:149). While there is limited evidence of widespread, organized, full-time craft specialization, there is evidence of part-time craft specialists who were still responsible for some aspects of subsistence activities in addition to their craft production (Arnold 1987:51; Hollimon 1990:61). For the Chumash, part-time, specialized crafts included baskets, wooden bowls, mortars, nets, and stone beads (Arnold 1987:22).

This review of what is known about Chumash culture at the time of contact informs the social contexts in which the Emigdiano Chumash likely lived. The following section provides a discussion of what is known about the interior Chumash region specifically. Intensive and continuous work in recent years by Robinson, Bernard, and others has done much to shed light on the Chumash eastern periphery (Bernard 2008; Cockcroft 2015; Robinson 2006; Robinson et al. 2007, 2008, 2009, 2010, 2012; Horne 1981; Mikkelsen et al. 2014a; Wienhold 2014). Importantly, the social and physical landscape of the San Emigdio Hills is drastically different from the settings in which

coastal Chumash development occurred and should be investigated independently to understand the history of the region and how it relates to other Chumash regions.

Interior Chumash Background

The interior Chumash region has traditionally been broken up into three general areas that are separated based on geography more so than any linguistic or archaeological evidence: the Cuyama, Castac, and Emigdiano regions (Bernard 2008: 37). Cuyama was the largest of the regions with population estimates at around 1,000 at the time of contact. The Emigdiano region was estimated at having a population of several hundred (Grant 1978b:534), however it is likely that prior to colonization populations may have been slightly denser (Bernard 2008:41).

These interior regions have been surveyed over the last 40 years, with attempts at regional synthesis only undertaken recently (Grant 1978b; Horne 1981; Robinson 2004; 2007; 2010; Bernard 2008; Mikkelsen et al. 2014a). Further, the ethnographic and ethnohistoric record for the Emigdiano Chumash is scant at best. In years past, the interior Chumash region has been perceived as a hinterland of simplified cultural expression (Horne 1981: 5). However, the interior Chumash archaeological record disproves this misconception and attests to the robust and unique culture history of the region.

With evidence of occupation in California to the east and west of the Emigdiano region as early as 12,000 years ago, it is probable that people used the area, at least sporadically, at this early time (Mikkelsen et al. 2014a:165). Until recently, there was little evidence of Chumash use prior to about 2500 BP (Horne 1981: 42; Bernard 2008). However, in Cuyama Valley, site CA-SBA-585, a habitation and bead production locale

with numerous features and hundreds of tools, clearly dates to the Early period with shell radiocarbon dates ranging between 4600 and 4000 BP. Also, CA-SLO-576, a habitation area which contained human remains, buried features, and an artifact scatter, produced radiocarbon and other dates with a range between 10,173 and 8310 cal BP, placing the primary occupation of this site in the Millingstone period (Mikkelsen et al. 2014a:255). In addition, Three Springs (CA-KER-3388), a large site with several bedrock mortars and rock art, located in the San Emigdio mountains, produced an AMS date from a deer jaw between 5661 BP-5586 BP (David Robinson, personal communication 2016). The limited presence of sites with early dates suggests a predominantly temporary or sporadic used of the area during the Millingstone and Early period into the Middle period (Bernard 2008:53). Evidence indicates regular, sustained, occupation of the region did not occur until the Middle period (3000-1100 cal BP) (Horne 1981; Bernard 2008:53; Mikkelsen et al. 2014a).

Settlement patterns for the Cuyama Valley can be divided into two types, differentiated by location. In the northwest portion of the valley, where fresh water is confined to the valley floor, occupation sites are limited and set close to this resource. Numerous temporary camps for resource procurement and processing are located in the hills above the valley. In the southeastern portion of the valley, water in the hills is more abundant throughout the year and there is a comparable amount of occupation sites as there are temporary camps scattered across the foothills. In general, the people living in the Cuyama Valley likely had a predominantly sedentary settlement pattern with seasonal dispersal for the purpose of resource procurement and processing (Mikkelsen et al. 2014a:296). This pattern of lower elevation sedentary aggregation, with seasonal

dispersal for harvesting and other purposes into different elevations and environments, has also been observed for the interior Chumash in the Los Padres National forest (Horne 1981). Horne notes that in the Middle period, differential use of lower elevation sites is observed, with evidence for specialized production among the usual household economic activities (Horne 1981:50). What is important to note here is that, while general trends are the same, microenvironments led individual residential or familial groups to operate in fluid ways which best suited their needs and the distribution of resources across the environment.

Emigdiano Chumash Background

Three Emigdiano villages have been documented ethnohistorically, located along major drainages at the northern base of the hills. From west to east they are *Malapwan*, *Tashlipun*, and *Tecuya* (Figure 2-4) (Robinson and Wienhold 2016). Most recently, the Enculturating Environments Project has been investigating "the prehistoric and historic enculturation of the environment seen in rock-art, land use, material culture, and social interactions within past communities and within their local environments" (Robinson 2010:4).

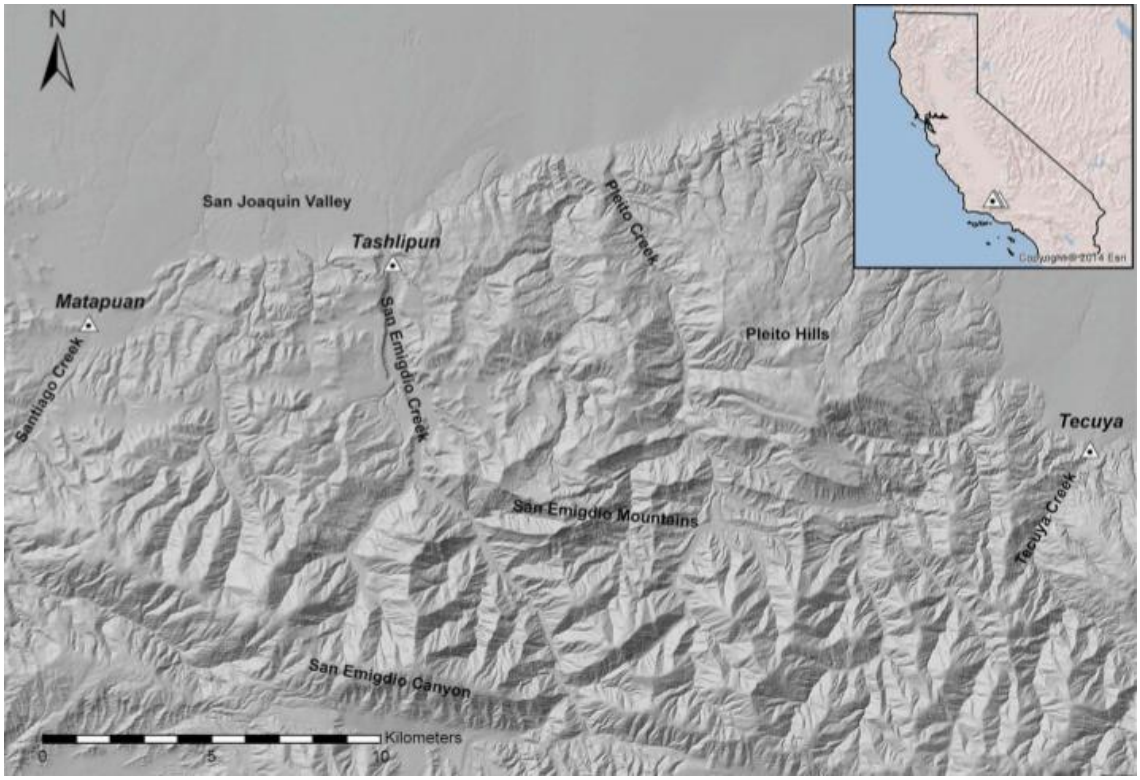

Figure 2-4 Villages in the Emigdiano Chumash Region. (Robinson and Wienhold 2016:6)

Archaeological survey of the foothills of the San Emigdio Mountains has revealed patterns of land use practices that appear to follow general trends for prehistoric settlement patterns in Southern California, similar to those discussed for Cuyama Valley and the Los Padres National Forest. Robinson (2006) notes that in his survey of the Wind Wolves Preserve, where he identified 105 sites, 70 sites (66%) contained bedrock mortars (BRMs) while only 16 sites (15%) exhibited surface lithics or midden deposits (Robinson 2006:191). Much of the region is comprised of oak woodland environments, suggesting that people were intensively harvesting and processing acorns for food and other economic needs. The number of bedrock mortars at sites varies from a single milling feature to over 100 BRMs (Robinson 2006).

Following Jackson's research on land use patterns in the southern Sierra Nevada Mountains (Jackson 1984), Robinson differentiates BRM sites in the San Emigdio region into three types: Villages, K-locales, and small BRM sites (Robinson 2007:192-3). Villages (n=3) in the San Emigdio region are situated at the lower elevations of canyon mouths and contain numerous BRMs. These sites exhibit evidence of extensive occupation and reflect residential settlements rather than seasonal encampments. K-locales (n=16) exhibit at least 18 bedrock mortars, evidence of extended occupation, and often contain some element of rock art. These sites are located at higher elevations and represent seasonal habitation areas where multiple families came together as they moved through their territory annually. Smaller BRM sites (n=55) contain between one and 17 mortars, are distributed more evenly throughout the region, and may represent individual or single family processing locales (Robinson 2006:193).

In general, evidence suggests that in the Late period, Emigdiano Chumash practiced a seasonal settlement pattern of aggregation and dispersal. Wintering in villages where families would congregate, groups would then disperse into the backcountry in late summer and autumn to take advantage of different plant resources as they became available. Families would aggregate again at certain times and places in the backcountry for ceremonial celebrations among other economic endeavors, and return to the lower elevation village at the end of autumn and start of winter with their stores of food for the season (Robinson 2007:193). Smaller sites with BRMs likely represented locales where single families would spend a short amount of time (maybe up to one week) collecting acorns and beginning to process some of them. Families would come together at the larger well-watered K-locales to process and store sufficient amounts of acorn meal for

the coming winter months. Importantly, these K-locales provided a number of resources beyond oak trees and bedrock outcrops and all manner of social, economic, and other activities would have taken place at these locations.

Acorn processing has been overwhelmingly linked to women's subsistence activities. Jackson notes that "[t]hese food processing sites represent the creation by women of fixed production facilities on the landscape which are related directly to the organization of women's labor and production" (Jackson 1991:312). This suggests that these locations were likely prime places for additional productive efforts by both men and women, evidenced by the wide array of artifacts and diversity of assemblages present at these sites.

In addition to the villages, BRM sites, and other smaller surface artifact scatters, the region exhibits at least one cache cave. Storing artifacts in dry caves across the Chumash interior was a common practice, even after colonization (Robinson et al. 2012: 283). These cache caves contain well preserved artifacts not commonly found at other open air sites, such as numerous baskets, stored plant materials, wooden bull-roarers, deer bone whistles, arrows and arrow straighteners, and feather bands (Robinson et al. 2012:283). The materials recovered from caves are generally associated with either subsistence or ritual activities, with the subsistence assemblages more directly associated with the Chumash and the ritual assemblages potentially associated with the Tataviam (Robinson et al. 2012:284).

Summary

The Chumash had a dynamic social and political hierarchy, practiced sedentary and semi-sedentary settlement patterns, engaged in hunting, fishing, and plant gathering

subsistence strategies, participated in regional trade networks, and had an extensive ceremonial and religious system. Particularly relevant to this study is the way in which settlement patterns and site use are tied to economic activities, guided by environmental settings and social needs. Too often, the topic of hunter-gatherer economy is dominated by a discussion of subsistence or specialized craft production, with little research that explicitly focuses on the tasks which constitute the Chumash daily practices that support domestic and exchange economies. People engaged in a myriad of tasks, both specialized and domestic, within society (Arnold 1987; Blackburn 1975; Hollimon 1990:32). In particular, basket production and use straddles the line of domestic daily production and part-time specialized production, making the study of basketry useful for examining a cross section of Chumash economic production patterns.

CHAPTER 3: CALIFORNIA BASKET PRODUCTION

Having discussed Chumash culture and provided a review of previous investigations in the interior Chumash regions, it is necessary to examine the literature on basketry in Southern California to identify what is known and not known about the production of this essential craft. The term basketry has been used to discuss a wide variety of perishable textile items such as matting, sandals, bags, and more (Connolly et al. 1995), however, for the purposes of this review, a basket is defined as "a receptacle made from finely interwoven vegetable fibers that have been either twined or sewn together in coiled, concentric rings" (Hudson and Blackburn 1987:212).

Though the timing and nature of the introduction of basketry in California remains contested (Adovasio 1977; Anderson 1999; Connolly et al. 1995; Elsasser 1978; Gieb and Jolie 2008), what is clear is how ubiquitous the technology was by time of culture contact with the Spanish in the mid 1500s (Hudson and Blackburn 1987). Fiber technology was an essential element of daily life for the various societies in precolonial California. Baskets were used for all manner of tasks and came in a multitude of forms including water bottles, burden baskets, parching trays, seed beaters, storage baskets, hats, gambling trays, game pieces, mortuary baskets, and cooking baskets to name a few (Dean et al. 2004; Elsasser 1978; Hollimon 1990; Hudson and Blackburn 1987). It has been estimated that approximately 50% of fiber technologies and material culture were associated with basketry[1] (Anderson 1999:82).

The standardization of basketry analysis and classification for western North America established by Adovasio (1970) was a significant advancement in the field of

[1] Plants were used to make a wide range of objects used in daily life, including mats, clothing, toys, structures, bags, twine, and more.

North American perishable technology research. This allowed basketry research to examine variation within a single culture and between cultures through time. To date, much effort has been put into studying baskets to establish the antiquity of technologies (Connolly et al. 1995; Geib and Jolie 2008), cultural affiliation and distribution of basket technology types (Adovasio 1974; Bates 1982; Jordan and Shennan 2002, 2009; Kroeber 1909; Shanks 2010; Zigmond 1978), and production materials and techniques (Anderson 1995, 1999, 2005; Benson et al. 2006; Farmer 2010; Hector 2006; Hudson and Blackburn 1987; Pearlstein et al. 2008). This body of knowledge has been developed from archaeological specimens, ethnographic basketry collections and ethnographic data on production. More recently, cultural studies of historic and contemporary weavers have explored native traditions and traditions of academic research through a critical lens (Cadge 2000; Chavez 2012; Dozier 2000; Hough 2003; Ortiz 2008). These types of information are foundational to developing an understanding of the systems of basket production in the past.

The craft of weaving is a California tradition that dates back thousands of years and continues into the present (Dozier 2000:4). Today there is a thriving community of Native American basket weavers across California. This skill has been revitalized over the past several decades (Ortiz 2008) and is, as it has always been, an act of individual and cultural expression passed on from one generation to another. Work with contemporary weavers highlights that, while basket weaving is laced with tradition it is also an expression of the "skilled, thoughtful, and creative agency of the weaver" (Ortiz 2008:V).

Though individual agency can be hard to observe in the archaeology of hunter-gatherer communities (Sassaman and Holly 2011), the additive nature of basket production is a showcase for many of the weaver's choices. Jolie and McBrinn assert that

> [A] perishable artifact can be viewed as made up of many "essential features" that embody its particular cultural character, identity, and meaning. Recognizing that individual choices are culturally informed and constrained, the student of perishable technologies is given a rare glimpse into a physical embodiment of individual and group identity that may yield clues to the formation and maintenance of sociocultural boundaries across time and space (Jolie and McBrinn 2010: 155).

Archaeological research on basketry in California tends to focus on what can be learned from analyzing the finished basket, seldom investigating the system of production as a whole. Basketry is often encountered archaeologically and in museums at the end of its use life, detached from some of the actions and choices of the creator (Dozier 2000). For example, while material choice, weaving style, vessel form, and context of use might be identifiable through analysis of an archaeological basket, the technological aspects as it were, the contexts of production cannot be observed.

This chapter contextualizes known aspects of basket production by offering a brief review of previous basketry research in California and information for Chumash basket production, including materials used, construction techniques, and observations on where various production stages have been noted to occur. This information is essential for identifying basket production locations.

Previous Archaeological Investigations of California Basket Production

Western North American basketry has been of interest to the outside observer from the time of contact. Many references to the quality, variety, and utility of baskets were made by some the earliest Spanish, Mexican, and American settlers in the area

(Hudson and Blackburn 1987: 212-14). This craft captured the imagination of people across the country and around the world. Later, during the Arts and Crafts period, from 1880 to 1930, California basket makers could sell their baskets to interested collectors for a good price (Cadge 2000:100; Dozier 2000:18). The baskets made by past California people caught the interest of early avocational and professional anthropologists and archaeologists as well. Dozier notes that the women who wove baskets generally had little direct interaction with the white male anthropologists of the late 1800s and early 1900s because of cultural perceptions about "social propriety" (Dozier 2000:18). Because of this, women's crafting processes were often excluded from discussions of production. Instead, interested anthropologists focused their attention on the baskets they could purchase, to cultivate an understanding of the material aspects of basket production (Anderson 1999: 81-82; Dozier 2000:19). Initial archaeological research into baskets also focused on well-preserved prehistoric items, most commonly found in dry caves of the Great Basin, with the goal of classifying these items into types (Adovasio 1970:3-4). This research was generally based on localized assemblages with little or no standardized use of terminology with which to conduct interregional comparisons (Adovasio 1970:6; Dawson and Deetz 1965; Peck 1950; Kroeber 1909; Weltfish 1930).

Previous studies on California archaeological baskets treated these artifacts as chance finds (Good 2001: 210), typically cached away in dry cave environments (Adovasio 1970), out of context from everyday use. Although ethnographic accounts and the archaeological record provide some information about weaving techniques, materials employed, and cultural traditions and uses of basketry (Hudson and Blackburn 1987; Latta 1977, 1976; Farmer 2010; Timbrook 2008; Zigmond 1978), understanding of pre-

colonial basket production systems in California remains limited. This is partially due to the rarity of preserved perishable materials at habitation sites and activity areas which, in California, do not usually exhibit the consistent wet and cold or hot and dry environments in which perishable items typically preserve (Good 2001:217). The perishable nature of the worked material, the lack of access or interest of many early ethnographers in how women traditionally produced baskets, and the fact that evidence of production processes is not commonly found or analyzed in the archaeological record have led to an uneven understanding of the system of producing baskets in the past.

A few individuals have proposed ways to identify basketry production in the past, beyond exceptional circumstances of preservation (Anderson 1999, 2005; Benson et al. 2006; Brown and Vellanoweth 2014; Hector 2006). Kat Anderson (1999) suggests several ways to study plant resource management regimes people employed as part of the basketry production process, emphasizing a plant based, landscape approach. First, Anderson recommends reviewing early photographs and ethnographic literature to identify what types of plants would have been cultivated and modified for use in basketry and what the resulting materials looked like (Anderson 1999:89). Examining museum specimens of harvested basketry material that were never used is another way of documented what characteristics were desired and how people may have managed the plants to achieve these qualities. Anderson also suggests that an anthropological approach to interviewing and learning from contemporary California Indian weavers is a way to gain insights on traditional practices that have been passed down and would likely have been used in the past (1999:92). Finally, Anderson suggests that field observations of

plants and experiments in managing plant growth can provide useful information on the earliest stages of basketry production (1999: 99).

Frank Latta, a central California ethnographer, wrote of the traditional Yokuts practice of harvesting sedge rhizomes, noting that families insisted on returning to the same places generation after generation because of the knowledge they had of plant behavior at the spot and because the plants had been cultivated to produce long straight roots which they could reliably harvest (Latta 1977:538-9). Though missionization and colonization interrupted these practices starting in the early 1800s, old stands of certain slow-growing plants may show evidence of intentional modification from pruning, burning, and selective cultivation. For example, Wilke (1988) was able to identify cut marks on juniper trees that were modified to make bow staves. Along with modern plant communities, archaeobotanic evidence provides insight into which plants may have been used at a site, some of which likely served functions other than food or medicine. Ultimately, Anderson argues that understanding how Native people used and managed their plant resources from an ethnographic and traditional sense can help us interpret where baskets may have been produced in the past (Anderson 1999; 2005).

Benson and colleagues (2006) conducted an isotope and trace-metal analysis of plants from textiles recovered from the Great Basin to determine that these materials were harvested from the banks of rivers or marshes where water was moving, rather than from lakes or other standing water sources. The study also differentiated between plants harvested from different watersheds. This study was useful for confirming that a region in the Great Basin did not make a certain type of textile (Benson et al. 2006). Though this is

not directly applicable to examining the production process locally, it indicates that it may be possible to source where basketry materials came from.

Taking a slightly different approach, Hector (2006) focused her efforts on identifying the types of tools and features that preserve archaeologically which can be used to make inferences about where perishable technologies were being produced. Hector has described several of these material traces which include features, such as rubs, milling slicks that have a distinct morphology associated with processing yucca for fibers, and artifacts such as awls, stone knifes, lithic flakes, tarring pebbles, and modified shells. These features and tools were used at various stages of perishable craft production. Flakes and shells used for basketry production tasks are not typically morphologically diagnostic and are not often considered when analyzing basketry. However, detailed examination, such as microwear analysis, can identify traces of use in plant processing for basketry production.

Though not focused on California basketry, in his research Miller (2014) conducted a microwear analysis on lithics from the Clovis-age Paleo Crossing site in Ohio to determine if lithic artifacts from the site were used to process plant materials for perishable technologies. A combination of experimental, ethnoarchaeological, and microscopic analysis methods were used to determine if any of the artifacts had been used for the specific purpose of making fiber materials. Many artifacts exhibited microwear associated with the processing of fiber technologies. Miller determined that scraping motions associated with plant materials are only identified in the manufacture of plant-based technologies, never with processing of plants used for subsistence (Miller 2014: 298).

Brown and Vellanoweth (2014) investigated basketry production by analyzing and categorizing tarring pebbles. Tarring pebbles are smallish heated stones that are tossed into a basket with pieces of asphaltum which then melt from the heat of the hot stones. The asphaltum is smeared around the inside of the basket by the stone, producing an interior coat and a water tight seal. In their work, Brown and Vellanoweth examined tarring pebble clusters from three sites located on San Nicolas Island, one of the southern Channel Islands. Nearly 850 pebbles of the approximately 2,300 examined showed evidence of asphaltum and over 1,000 exhibited evidence of heating as suggested by cracks and spall (Brown and Vellanoweth 2014:6). This analysis indicates that tarring pebbles seem to vary in size, depending upon their intended use. Moreover, they tend to be deposited in discrete clusters, that suggest activity areas, but are also found scattered ubiquitously across a site in the case of the known village. These items were found at different site types suggesting that for the people of San Nicolas, tarring could be done in multiple places but that certain types of tarring may occur at specific locations (Brown and Vellanoweth 2014:12-13). Brown and Vellanoweth suggest that pebble size differences may reflect the sizes of the water bottle openings that they would have been used to tar (Brown and Vellanoweth 2014:14). This approach to studying basketry production tools indicates that detailed analysis can identify variation in an artifact class and that this variation can provide more detailed information about basket production than previously considered.

Ethnographic Information on Basket Weavers

Information regarding basket manufacture can be gleaned from ethnohistoric and ethnographic sources. This type of information is useful for making inferences about who

made baskets, what kinds of baskets were made, and how baskets were used. Ethnographic data may also be used to indicate what types of analysis could identify production in the archaeological record and where production might have occurred in the past.

Women have been linked to textile production around the world (Costin 2013). As Dozier states, the reason women tend to produce woven goods is likely the ability of this work to be put down or picked up at any given point, allowing women the flexibility of childcare, something women have been primarily responsible for in the past as well (Dozier 2000). Hagstrum (2001) has suggested that in the southwest, basket weaving was easily scheduled in the daily and seasonal cycles of other work women participated in, such as pottery production and farming. Connected to the increased importance and use of plant foods in the diet, basketry production by women in California likely functioned as a creative means to address women's food processing needs and other responsibilities.

It has been well documented that women were the primary producers and users of basketry in Southern California cultures generally, and the coastal Chumash, Yokuts, and Tubatulabal cultures specifically (Hollimon 1990; Hudson and Blackburn 1987; Latta 1977, 1976; Voegelin 1938). The Spanish recorded many accounts of basket making and exchange. Soldier and explorer Pedro Fages noted that in Chumash society, women made nearly all the baskets in every form necessary (Hudson and Blackburn 1987:212). While men were observed to occasionally make course baskets, the production of well-made basketry was considered to be the work of women (Hollimon 1990:61).

This versatile and essential technology served many economic functions, played a role in various religious ceremonies, and served as indicators of individual skill and

prestige (Hollimon 1990). In the home, many baskets were used for food preparation, serving, and storage. The *Wukchumni* Yokuts considered six types of baskets essential for women's household responsibilities of food gathering, processing, and cooking (Hollimon 1990:68). As related to Chumash religious life, special baskets were made by women for burying the dead and additional baskets would be made to hang from women's grave poles and to be burned in mourning ceremonies (Hollimon 1990). In addition to these domestic and ceremonial uses, women made baskets for leisure activities such as gambling (Timbrook 2007:114).

It has been noted that in Chumash culture there were basketry specialists, women who made unique items with restricted knowledge, suggesting there may have been some organized control over the labor (Arnold 1987:22-33; Hollimon 1990:72). More commonly though, talented women were considered highly skilled craft persons, renowned for their skill but not linked to any form of specialized production, still responsible for everyday tasks in addition to their weaving (Hollimon 1990:69). Hollimon states, "True craft specializations among Native Californians seem to have cross-cut age and sex categories" (Hollimon 1990:74). This suggests that basket production, a clearly gendered production task does, not meet that classic definition of specialized craft production, though some women with great skill were likely part-time specialists (Arnold 1987:20-21).

Stages of Basket Production

There are four mains stages in basketry production: harvesting plant material, processing plants to make weaving material, storing materials while not in use, and weaving and finishing the basket. However, simplifying this process into four stages can

blur the true complexity of basketry production. As Dozier aptly recounts, the details of basketry production include “gathering, splitting, sizing, and dyeing, as well as soaking the materials, locating and punching holes with the awl, introducing each sewing strand, positioning the stich with the correct face of the withe exposed, and securing each stitch with the right amount of tension” (2000:49-50). At each stage precision is key if a quality basket is to be made. Materials must be harvested at the right time so that they are supple, straight, and of the right color, they must be processed correctly so that the materials are all the same desired width, thickness, and type, and they must be woven carefully with even stiches and patterns (Dozier 2000:50; Farmer 2012).

Dozier indicates that a wider variety of methods and techniques are anticipated to be employed at the periphery of cultural centers (Dozier 2000:50-1). This has implications for what one might expect to see in the Emigdiano Chumash area, a peripheral region of the larger Chumash sphere. More variation may take the form of materials used, tools employed, and spaces used for production. As discussed in the cultural background section, the influence of other local tribes such as the Yokuts or the Kitanemuk likely shaped some Emigdiano cultural behaviors. For these reasons, both Chumash and other available ethnographies inform assumptions about the tradition of basketry production in the San Emigdio region.

Basketry Plant Materials

Many types of plant species were used to make baskets and other fiber objects in California. The types of plants used, the parts of plants selected, and the baskets made varied regionally based on local tradition and availability of plant species. Notable plants used by California groups include juncus, willow, sumac, redbud, deer grass, and yucca

(Zigmond 1982; Farmer 2010; Hector 2006; Timbrook 2008). At the time of contact, the Chumash had a complex folk taxonomy for the plants they knew; however, there is some overlap with the western scientific taxonomy. While today's taxonomic system is organized by reproductive structures, the Chumash organized species by growth habits and stem features (Timbrook 2008:119).

Table 3-1 provides information of plant types used, who they were used by, and what they were used for in Southern California basketry. Many of these plants have multiple uses, but only their uses in basketry manufacture are noted here. This list was compiled from the works of Timbrook (2008), Justin Farmer (2010), and Hudson and Blackburn (1987).

Table 3-1. Plants Used for Basketry in Southern California

Plant Name	**Part Used**	**Uses**	**Affiliated Cultures**
durango root *Datisca glomerata*	Root	Dye juncus yellow	Chumash
California black walnut *Juglans califomica*	Shredded Bark	Finishing basket rims; used for decorative designs	Chumash
rush** *Juncus textilis*** *Juncus acutus* *Juncus balticus***	Split Stem Whole Stem Whole Stem	Coiled basketry weft (weaving material) Used in twined basketry Coiled basketry warp (foundation)	Chumash, Kitanemuk, Gabrielino, Cahuilla, Luiseno
tule** *Scripus californicus*** *Scripus americanus*** var. *monophyllus*	Whole shoots/ Split root	Sewing strands for coiled and twined baskets; used for making twined matting	Yokuts, Chumash (likely interior Chumash, or not used later in time)
willow** *Salix* spp.	Peeled shoots	Peeled shoots used as coiling foundation, spilt shoots used as coiling material. Willow was also used in twined baskets	California and southwest groups; Chumash (rare)

Table 3-1. Plants Used for Basketry in Southern California

Plant Name	**Part Used**	**Uses**	**Affiliated Cultures**
three-leaved sumac *Rhus trilobata*	Woody stems	Weaving material for coiled basketry	Chumash, Cahuilla
deer grass** *Muhlenbergia rigens*	Culms	Basketry foundation	Chumash, Cahuilla, Yokuts
Sedge *Carex* spp.	Rhizome	Peeled and split roots are used in coiled basketry	Yokuts
red bud *Ceris occdentalis*	Shoots	Peeled and split shoots can be used as foundation or for sewing material	Yokuts
Cottonwood *Pupulus* spp.	Stems	--	Yokuts
Yucca *Hesperoyucca whipplei*	Leaf	Shredded leaves provide fibers for basket starts	Cahuilla
milkweed** *Asclepia spp.*	Bark	Mostly used for cordage, occasionally as a basket start	Chumash (rare), Washo
Santa Cruz Island ironwood *Lyonothamnus floribundus*	Bark	Possibly boiled bark to dye juncus	Chumash
mountain-mahogany *Cercocarpus betuloides*	Bark	Possibly boiled bark to dye juncus	Chumash
giant rye/giant wild rye** *Leymus condensatus/ Leymus cinereus***	Culms	--	Chumash
California broom/ deerweed *Lotus scoparius*	--	Burned to produce a smoke that would help dye juncus black	Chumash
surf-grass/ seagrass *Phyllospadix torreyi*	Whole Shoot	Twined basketry	Island Chumash
pine** *Pinus* spp. [except *P. monophylla*]	Needles	Contemporary use in open coil basketry	Many people today
one-leaf pinyon**			

Table 3-1. Plants Used for Basketry in Southern California

Plant Name	Part Used	Uses	Affiliated Cultures
Pinus monophylla	Nut	Nuts were strung on a line and sewn into small baskets	Chumash and Kitanemuk
bracken fern *Pteridium aquilinum*	Rhizome (dyed black)	Weaving strands	Chumash, Yokuts, Mono, Pomo, Washo, Paiute
wild rhubarb/ canaigre *Rumex hymenosepalus*	Root	Mashed up and used to dye basketry material yellow	Chumash
Nuttall's snowberrry/ chaparral honeysuckle *Symphoricarpos mollis/ Lonicera subspicata*	--	Coarsely twined baskets chiquihuites	Chumash
poison-oak** *Toxicodendron diversilobum*	Stems	Nonspecific baskets	Pomo
California wild grape/ desert wild grape** *Vitis californica/ Vitisgirdiana*	Vine	Lashing and basketry material	Northern California groups

** Indicates Plants Located in the Project Vicinity

For the Chumash, the most important basketry plants included several species of juncus, three-leaved sumac, and a few other plants which show regional variation based on environment. Where seagrass was an important fiber for island peoples, deer grass and yucca was more prevalent among interior populations (Timbrook 2008). Juncus is arguably the most important basketry making material for the Chumash (Dawson and Deetz 1965; Timbrook 2008:308; Hudson and Blackburn 1987).

Plants present on Wind Wolves Preserve that are known to have been used by the Chumash and other neighboring groups to produce basketry include *Juncus textilis*, *Juncus balticus*, tule, willow, deer grass, cottonwood, milkweed, giant wild rye, pine,

one-leaf pinyon, poison-oak, and desert wild grape (Wildlands Conservancy 2016a). Basketry recovered from this region appears to be made of a wide variety of materials. Juncus was used in coil and bundle for coiled basketry, a bunch grass, which is likely deer grass, was also used for bundle foundations in coiled basketry. Sumac or willow has also been observed in coiling. Twined basketry appears to be mostly made from tule with some juncus and the evidence of other woody plant stems, which may be sumac (Jolie 2013:3). It is most likely that the Chumash people living around the San Emigdio Mountains used juncus, sumac or willow, deer grass, and possibly sedge root for most of their coiled basketry production. Materials were often traded for as well, so exotic materials such as redbud or devils claw may also have been accessed by people through trade networks (Dean et al. 2004:10; Zigmond 1981:35).

Harvesting and Processing Basketry Plants

The following section provides a review of the ethnographic and contemporary knowledge around how the Chumash and other Southern California groups processed certain plants to prepare them for use in weaving coiled basketry. The focus is on coiled basketry production because it is known to require more steps in plant preparation and therefore, has a greater chance for tool use which may be identified in the archaeological record. Addressed here are the known practices associated with preparing plants for harvest, such as cultivation techniques and processes for plants likely to be used in the region of interest. These include juncus, three-leaved sumac and willow, and deer grass. Not addressed here are weaving techniques, which will be addressed briefly in the following section.

Basketry Plant Management

It is well documented that harvesting locales were not random, but were intentionally selected and cared for through generations. Though environmental conditions dictated what plants could grow in a region, women made use of the resources available, cultivating them to meet their needs. Families often had special areas for gathering plant materials that were used exclusively by their lineage through time, unless permission was given to outsiders (Dozier 2000:166). As ethnobotanist Kat Anderson notes, "Detailed observation and experimentation with the natural environment over many generations led to a profound native knowledge of how natural systems work and an understanding of the basic reproductive biology of plant populations crucial to subsistence economies" (Anderson 1999:80). This includes plants used as food, medicine, and basket materials among others. Basket material cultivation was a particularly important reason for the management of the natural environment. Good basket weaving plant qualities that have been traditionally cultivated and selected for include flexibility, straightness, length, diameter, absence of blemishes or disturbance, and color (Anderson 1999).

In her discussion of woody shrubs and trees used for basketry material in California, Anderson states that only a handful on the hundreds of available species were used regularly, including redbud, wild lilac, hazelnut, sumac, and willow (1999:82). These plants are able to reproduce well after disturbance due to the presence of epicormic branches, which are defined as branches that sprout from hidden buds once the epidermis, or outer layer has been injured, cut or burned (Anderson 1999:83). The shoots that emerge tend to flower late and develop in long, straight, branches that are ideal for

basketry needs. Anderson notes that these shoots do not sprout often enough naturally and human action is required to foster enough development to meet basketry production needs; this action includes fire and pruning (1999:83). This modification which occurred at different stages of plant growth produced straight shoots, which would grow long with limited branching to interrupt or blemish the surface, making the materials stronger, and when harvested within the first year of growth, very flexible in weaving tight baskets.

Deborah Dozier's (2001) discussion of Kumeyaay basketry plant management systems provides details about juncus selection practices. Dozier notes that only the greenest rushes were harvested and there was a preference for uniformity in length, thickness, and straightness. In addition to these above ground plant attributes, juncus is prized for the mahogany base, or bottom 12 inches of the stem, which gets its colors from the mineral rich earth, as opposed to the sunlight of the above ground plant (Dozier 2000:171). The red color cannot be seen, but women who harvest generationally come back to the same places because they can reliably revisit these red bases which are used to decorate baskets in the weaving process.

During his work with the Yokuts, San Juaquin Valley historian Frank Latta was invited to harvest sedges with a Yokuts family who informed him that the location they visit had been used by their family for four generations and it was the place they *had* to go to harvest the plants (Latta 1977:538-9). This is partially because of the root modification that must take place to make the sedge rhizomes useable. As stated above, many plants used by women to make baskets do not naturally exhibit the qualities that define good weaving material and thus must be cultivated (Anderson 1999:80). The root systems of sedges were used to weave baskets. These root systems typically grow in

snarled, kinky bunches. Women would dig up the roots and straighten them, removed rocks and tangles and other barriers that prevented the roots from growing straight. Through generations of plant lifecycles, these roots would eventually grow long and straight and would be useful for making strong, beautiful baskets (Anderson 1999; Latta 1977:539).

This review indicates that basketry production is a generational process not just in weaving techniques being passed down from family member to family member, but in the cultivation and maintenance of the plant resources and the knowledge of plants to be used in weaving. Having provided a general review of cultivation practices, the following section discusses the details of harvesting and processing of plants that were likely used in the Emigdiano region.

Juncus Harvesting and Processing

Both *Juncus textilis* (Figure 3-1) and *Juncus balticus* are perennial grass-like herbs that are often referred to under the general terms basket rush and baltic rush respectively. The Chumash word for *J. textilis* is *mexme'y* and for *J. balticus* the Chumash word is *tas* (Hudson and Blackburn 1987:214-215). A third type of juncus commonly used in twining basketry, *Juncus acutus*, was called '*esmu*' by the Ventureño and Barbareño Chumash. Because this latter species has not been observed on the preserve, it will not be discussed further here.

Figure 3-1 Juncus growing near a creek in the mountains above Hemet, California

Juncus tends to grow in well-watered areas near springs, creeks and lakes. Where *Juncus balticus* has a wide distribution across North America and can grow in slightly more dry environments, *Juncus textilis* is endemic to Southern California and is more of a wetland plant. *Juncus balticus* grows in clumps and usually reach 35-110 cm in length and about 1-6mm thick. *Juncus textilis* also grows in tufts or clumps, grows to heights of three to six or seven feet (100-200 cm), and is usually slightly thicker with stems about

one-quarter inch (3-5mm) (Timbrook 2008:124; USDA 2003a, 2003b). *Juncus balticus* was commonly used whole as rods and bunches, making up the foundational material around which other plants were woven in the production of coiled basketry. *Juncus textilis* was commonly processed by the Chumash and other Southern California groups to weave coiled baskets (Hudson and Blackburn 1987:214-5; USDA 2003a,2003b). Juncus was not an important weaving materials to all Southern California Native Americans. The Kawaiisu perceived juncus as an inferior basketry material only to be used by children (Zigmond 1978), possibly due to the fact that the Kawaiisu have a culture history distinct form the Chumash or because good quality *Juncus textilis* did not grow in their territory. *Juncus textilis* was specifically used for making hats, hoppers, winnowers, burden baskets, storage baskets, parching trays, cups, and bottles (Timbrook 2008:128).

Seasonality: While the juncus is still growing, the base is a milky white color that may be used in weaving but which is not generally preferred. Instead, at the end of summer or start of autumn, the base of the juncus hardens and turns a rusty red color (Farmer 2012:4). This red portion can make up nearly 12 inches of the plant and was a preferred material for basketry design because it turned a golden orange when dried. Diegeño basket weavers have stated that this rust color base tends to be found on juncus growing around 3,000 feet elevation (USDA 2003a). The Kumeyaay also harvest juncus in the summer and have a preference for the deep red bases so prized for basket weaving (Dozier 2000: 172).

The processing of *Juncus textilis* for use in coiled basket manufacture occurs in three main phases: drying, splitting, and scraping. Traditionally, people do not use tools

to harvest juncus, but rather they take hold of the stalk at the base and pull up, removing the shoot from the root system (Daniel McCarthy, personal communication 2015; Timbrook 2008). After it is collected, fresh juncus can be treated to produce a desirable light tan color, or it is left to dry untreated (Hudson and Blackburn 1987:220). Farmer, a contemporary basket weaver, states that drying could take as little as one month but up to several months. During the drying process, the juncus must be rotated every few days so that the sun bleaches the culms evenly. Farmer also asserts that culms should not be split until they are fully dried because twisted pieces would not bleach evenly (Farmer 2012:9). However, Candelaria Valenzuela, one of Harrington's informants stated that twisted juncus would not be harvested, eliminating this concern (Hudson and Blackburn 1987: Timbrook 2008:124-5). Further, Valenzuela indicated that she would weave freshly collected juncus into a mat and leave it in the sun to dry, intimating little concern for uneven bleaching. The Kumeyaay of Southern California and Northern Mexico store harvested juncus in bundles between four and six inches thick, rotating often to prevent mildew and crushing (Dozier 2000:172). In contrast, Donna Largo, a contemporary Cahuilla basket maker, splits the rushes as they are harvested, prior to drying, and then coils them in large bunches to dry (Dozier 2000:172). Though methods varied, the plant was inevitably dried, which strengthened the already tough fibers, producing materials that could withstand great strain and last hundreds of years (Dozier 2000:173).

Valenzuela also indicated to Harrington that the desirable golden tan color was produced when freshly harvested *mexme'y* was treated by running the shoots through a freshly heated pile of old ash. A new fire would be built on top of old ash and once the fire had burned down the juncus would be run through the ash, strand by strand, with

caution taken not to burn the material (Timbrook 2008:125; Hudson and Blackburn 1987: 220).

Valenzuela stated that then she would leave the strands in the sun until the hearts dried, followed by removing them to a place for storage. Once the shoots were completely dried they could be stored in a cool dry place. Moving them to the shade too early could result in rotting (Hudson and Blackburn 1987:217). It appears that juncus was commonly stored whole in a cool place and not split until needed (Timbrook 2007:126; Hudson and Blackburn 1987:271).

When it is time to split the juncus, the ends of the shoots are removed so that there is a straight even length for all the juncus culms being processed, generally around four feet in length. When Harrington brought juncus to one of his informants, she had him cut the ends off. This suggests that some type of implement may have been used to cut the dried juncus at this stage (Hudson and Blackburn 1987:219). The shoots are then split lengthwise, divided into between two and four equal strands. This is done starting from either the base end or the top end, with one half of the juncus in the mouth and the other half in the left hand, the right hand is used to guide the split using a finger or an awl (Hudson and Blackburn 1987:217-221). Once the pieces are split, the pith must be removed from the strands. When dried, the exterior of the juncus stalk is notably hard for its size but the soft spongy interior pith can be removed with little force. Traditionally, juncus strands are scraped between the forefinger and a wide, flat, sharp object. In the past, Chumash people from the coastal regions used a broken clam shell, which they called *tikewewene'es* or *tikewewene'es 'icuwas 'I* 'alaqucum, to scrape out strands (Hudson and Blackburn 1987:218). Neighboring interior groups, such as the Yokuts, used

the sharp edge of a lithic flake, as opposed to a broken clam shell, for a similar process on basketry plants from the interior region (Latta 1977:541). In Cahuilla tradition, juncus is split and dried then soaked and scraped just before use (Pearlstein et al. 2008: 190). Timbrook notes that a similar juncus splitting and pith scraping process was conducted to make the line on which shell beads were polished in their final stages of manufacture (Timbrook 2008:117). For the Chumash, once strands are split and scraped, they are sized so that they all exhibit a similar width to make an evenly coiled basket. This was also done with a clam shell according to Harrington's Barbareño informants (Hudson and Blackburn 1987) and could have been done with a flake tool as well.

A final step in juncus preparation that was occasionally taken was the dying of the weaving materials. Colors of juncus used in weaving include golden tan, red, white, and black. The red color occurred naturally in the bases on juncus that grew in certain conditions, such as mineral rich sands, or higher elevations (Dozier 2000; Farmer 2010; Timbrook 2008). The tan color was achieved by either drying the juncus naturally or by running the freshly picked and cut, but not split, strands through reheated ash as discussed above (Timbrook 2008: 125). The white and black coloring took a bit more time and effort. Juncus could be dyed black in a number of ways, most common of which included burying in ferrous mud, or smoke blackening (Hudson and Blackburn 1987: 222-223). The split juncus would be taken to a place that had rich mud high in organic content. The juncus, in coiled form or laid out flat, would be buried deep in the mud and marked with a rock or stick. This would stay in the ground between a week and a month depending on individual need or mud consistency. This burial was done with juncus that was freshly harvested and split immediately, with the pith still on (Hudson and Blackburn

1987:222). Fernando Librado, a Ventureño and Cruzeño Chumash elder stated that once exhumed, the juncus was not rinsed but a fire was built in a hole and once the fire burned down to coals, California broom, or deerweed was placed on the coals, followed by the mud covered juncus, and then topped with more deerweed, and covered in mud. After about five to eight days, the materials were sufficiently died and could be stored until needed (Hudson and Blackburn 1987:222-4). The juncus could also be dyed white in a similar manner. Valenzuela described that whole, freshly cut juncus was placed in cold white ashes, covered nightly with grasses to prevent mildew, for about eight to fifteen days. This would lighten the materials and was ideal for using in combination with black and red decoration (Hudson and Blackburn 1987:223).

Juncus balticus required little to no processing for use in coiled basketry. It would be harvested similar to *Juncus textilis* by being pulled complete from the ground. Then it would be dried in a similar manner to *Juncus textilis*. The slightly thinner nature of this species meant that it could be used whole as bunch foundation in coiled basketry and required little to not cutting, splitting, or scraping.

Sumac and Willow Harvesting and Processing

Two of the most common types of wood used for making baskets and cradleboards in California were sumac (*Rhus trilobata*) and willow (*Salix* spp) (Farmer 2010; Dean et al. 2004). *Rhus trilobata,* commonly referred to as three-leaved sumac, skunkbrush, or sometimes squawbush, is widely distributed across the western half of the United States and up into central Canada. The Chumash referred to this plant as *suna'y (*Hudson and Blackburn 1987:216). This perennial shrub grows in rounded upright thickets that reach between 0.5 to 2.5 meters in height (USDA 2002). This plant's active

growth period is in the spring and summer in a wide variety of environments including prairies, shrublands and oak woodlands, in elevations between 1000-3000 meters above sea level. Preferred growth sites include dry rocky slopes, streamsides, seasonal drainages, canon bottoms, and sand dunes (USDA 2002). In addition to having been used as weaving material, three-leaved sumac also produces a berry that was used as a medicine as well as in food and drink (USDA 2002)

There are a wide variety of willow species (*Salix* spp.) (Figure 3-2) growing across western North America. The Chumash are known to have used several species, referred to as *saus* (Timbrook 2008:226). Within the preserve, three species have been documented (Table 3-1). Generally, willow is a large shrub or a small tree which usually has long thin leaves. Coyote willow, the most distinctive of the willow species can grow up to 7 meters tall. These plants tend to live in the wetlands of riparian forests, preferring growth sites such as streamside's and alluvial bottomlands. It has been noted that Coyote willow was often found at archaeological habitation sites, which attests to the importance of this plant to Native people (USDA 2003c). This plant was used by many North American tribes for a wide variety of purposes such as constructing houses, looms, boats, baskets, game pieces, prayer sticks, and more.

Figure 3-2 Willow growing in the foothills of the San Emigdio Mountains

Seasonality: Sumac is gathered in late summer, autumn or winter (Farmer 2012: 26). Farmer prefers to gather sumac in the summer when the sap is still flowing and bark can be peeled easily. However, Paiute women would collect and processes willow sapwood in the autumn, once the leaves fall, until spring, when buds begin to swell (USDA 2003c). Year old shoots with no branching are preferred; these were likely pruned the spring prior to collection to prevent branches from growing and interrupting the development of long straight shoots (USDA 2003c; Daniel McCarthy, personal communication 2015). Pruning and coppicing, cutting woody plants down to the ground, could allow the plants to grow long straight shoots to be used in basketry (Timbrook 2008:302; Anderson 2005). When the woody shoots were harvested, they had to be

processed relatively quickly to prevent the materials from becoming too dry or hard (Farmer 2012). This is different from juncus processing which often occurred later than the harvesting because materials had to dry in order to be used.

In her discussion of Kumeyaay basketry production, Dozier recounts how a number of plants were harvested and prepared for use in basketry. She writes "Steel blades make it an easy task to cut sumac. The fibers which make it such an exemplary material for basketry are so tough that they cannot be harvested without a blade. Bending and breaking the branches is of no avail; nor can the branches be stripped from the trunk of the plant. They must be cut. They are cut at the base of the stem where it branches from the trunk" (Dozier 2000:180-182). In the past, stone knives or sharp flake tools were likely used in place of today's knife.

The most common part of willow used as a weaving strand is the cambium, or the woody layer just beneath the shoots outer bark, which transports sap from the plants roots to the trees (Farmer 2012). Several steps are necessary to get this glossy, durable, paper thin plant part. Once the branches were harvested, they were split two, three, or four ways lengthwise down the middle, started with a sharp blade. From there, the wood core must be removed by pealing it out. Then the outer bark is also peeled off (Farmer 2012: 36-51), which could be done after soaking the strands or by simply pulling it off the dry strand. Then the strips would be laid out to be flattened and trimmed with a shell that would be used to scrape the pieces (Timbrook 2008: 217; Hudson and Blackburn 1987:225). Here again, the reference to use of shell comes from Barbareño informants. Interior groups may have relied or more available materials such as stone. Dean and colleagues (2004) note that once willow materials were prepared they would be coiled

and stored in the home, indicating that the materials could be kept indefinitely if stored properly (Dean et al. 2004: 36).

Timbrook writes of both the red and arroyo willow, found on the preserve, as having been used occasionally by the Chumash in basket production (Timbrook 2008). Willow was less used in coiled basketry than sumac was (Timbrook 2008:229-230), however peeled willow shoots were sometimes used as twining warp. Further, red willow, found on the preserve, was used to make open weave *chiquihuites* baskets which are likely a product of contact with the Spanish (Timbrook 2008:233).

Deer Grass Harvesting and Processing

Deer grass is distributed across southern and central California, as well as in a few other southwestern states (Figure 3-3). This perennial bunchgrass grows in large clumps and can reach up to 5 feet in height. The culms are spike-like pinnacles that are less than 1.2 cm in diameter. The plant tends to grow in well-drained sandy or gravely soils at elevations below 2150 meters in places such as valley grasslands, stream sides, and meadows that get a lot of sun (USDA 2003d).

Figure 3-3 Deer grass growing in the San Jacinto Mountains

Seasonality: The plants fruit stalk erupts in late spring and the seed stalks are mature by late summer when they reach their maximum height (Farmer 2012:35). Culms were gathered in the thousands in late spring (still green), or in summer and early fall when they were brown, dependent upon tribe (USDA 2003d).

While juncus was the most common material for Chumash coiled basketry foundation, baskets with deer grass have been found, mostly from the interior (Timbrook 2008: 154). In a similar fashion to juncus, the culms would be pulled out whole from the ground with no need to cut them. Then a stick or a leather covered hand could be used to

brush off the seeds, wiping from the tip downward against the direction the seeds lay (Daniel McCarthy, personal communication 2015). Once the seed husks have been removed, the culm is ready to be used. This plant is particularly useful as foundation precisely because it requires so little processing and it is relatively even in diameter from top to bottom.

Other materials used to make baskets in the area would likely have come from trade or required longer distance trips to acquire. These include some of the darker materials that were used in decoration. Possible identifications include Devils Claw or Bracken Fern (Jolie 2013:3). Additionally, modern ranching may have affected the natural distribution of other basketry plants in the area, causing formerly abundant plant communities to no longer be present in the area today. Modern plant distribution, ethnographic data, and archeological materials suggest that juncus and sumac or willow constitute the most likely materials to be processed locally for use in basketry. Therefore, the following review of basketry production will focus on these three plants.

Weaving a Basket

The following section briefly addresses basket weaving methods. The Chumash made and used dozens of types of baskets. However, traditional construction types fall into two main categories: twined and coiled. Though coiled basketry, which requires more plant processing and tools use, is the focus of this study, both types are discussed here.

Coiled Basketry

Coiling is a type of basket-making that involves wrapping a bundle of fibers (the foundation) with a weaving strand, which is sewn into a part of the bundle wrapped

earlier on in the process, in a spiral manner and an upward direction (Dean et al 2004: 49; Farmer 2012:xi). A large amount of Chumash baskets were of a coiled construction, including burden baskets, parching trays, storage baskets, hats, and more (Timbrook 2007:97-98).

Before starting to weave a coiled basket, a basket maker must soak the weaving materials in water to make them pliable. The plants must be moist enough that the rigid material will bend without breaking. However, they should not be soaked for too long a period because being over saturated makes the materials soft and breakable (Hudson and Blackburn 1987: 226). As juncus is the most common weaving material, the description of weaving a coiled basket will take this material as an example. The first step is to gather evenly shredded *Juncus textilis* (*mexme'y*) into a bundle to make a foundation, which is then bent into a tight spiral which serves as a 'start'. This foundation start is wrapped with split *Juncus textilis*, creating coils, which are sewn together with the split and scraped juncus, used as a weaving strand. An awl is used to pierce a hole in the foundation of a previously wrapped bundle, between wraps or stiches, and a weaving strand is run around the foundation and through the hole. The stiches are made between two previous stiches, not through a single stich of juncus, and around the protruding, yet unwrapped, foundation. (Timbrook 2008: 128-129). When Candelaria Valenzuela, an important Chumash informant who worked with Harrington, described the process of weaving, she noted that every few stiches, it was necessary to overlay stiches in order to avoid the stiches becoming diagonal (Hudson and Blackburn 1987:228).

A new weaving strand is added when the previous one is about 1 ½ inches in length. This length is left facing inside the basket. The new strand is inserted near the

hole of the previous weaving strand, but not in the same hole. A small bit of the new strand is left sticking out as well. The excess material left sticking out is not removed until the weaving has passed around the circumference of the basket between one to three times at least. Foundation bundle size is dependent upon the intended size of the basket, with thicker foundations used to weave larger baskets and thinner foundations used to weave smaller baskets.

While each woman had her own unique ways of accomplishing weaving, there are a number of weaving practices that had broad or regional presence in the Chumash weaving tradition. For the Ineseño, Barbareño, and Ventureño Chumash, this coiling and stitching was done in a spiral, clockwise direction, when looking into a basket (Hudson and Blackburn 1987: 226). Harrington noted that deer grass was used as the foundation in basketry after the shredded juncus start in the Ineseño, Barbareño, Ventureño, and Emigdiano groups (Hudson and Blackburn 1987:226). Usually only the most even and straight piece of juncus were selected for weaving strands, however, occasionally these weaving strands would have crooked segments that women would trim and straighten. This straightening was done using a fingernail by the informant who explained the process to Harrington; however, the informant mentioned that in the past women would have a clam shell nearby to do this (Hudson and Blackburn 1987:227). There are a number of other detailed aspects to the Chumash tradition of weaving a coiled basket that while important to the craft, are not particularly relevant to this discussion. For a comprehensive collection of information on coiled basketry production, see Volume V, Manufacturing Processes, Metrology, and Trade, of The Material Culture of the Chumash Interaction Sphere series (Hudson and Blackburn 1987:226-233).

What should be taken away from this discussion is the general weaving process for coiled baskets and the use of many different tools (Figure 3-4). Water containers made of wood or stone would be kept nearby for women to dip their hands in to keep weaving material moist (Hudson and Blackburn 1987:227). An awl, usually made of bone, would be used to poke holes in foundation bundles so that the weaving strand could be passed through. Many of Harrington's informants also note that a clamshell would also be used for many trimming tasks related to basket weaving (Hudson and Blackburn 1987:212-231). It should be noted Candelaria Valenzuela had family lineage from the Ventureño Chumash tradition that had closer links to the coast. This meant that there would have been easier access to clam shells than there would have been in the interior Emigdiano region. The function of the clam shell could have also been accomplished using a lithic flake, similar to the way a flake could have been used to scrape the juncus in the processing stages of production.

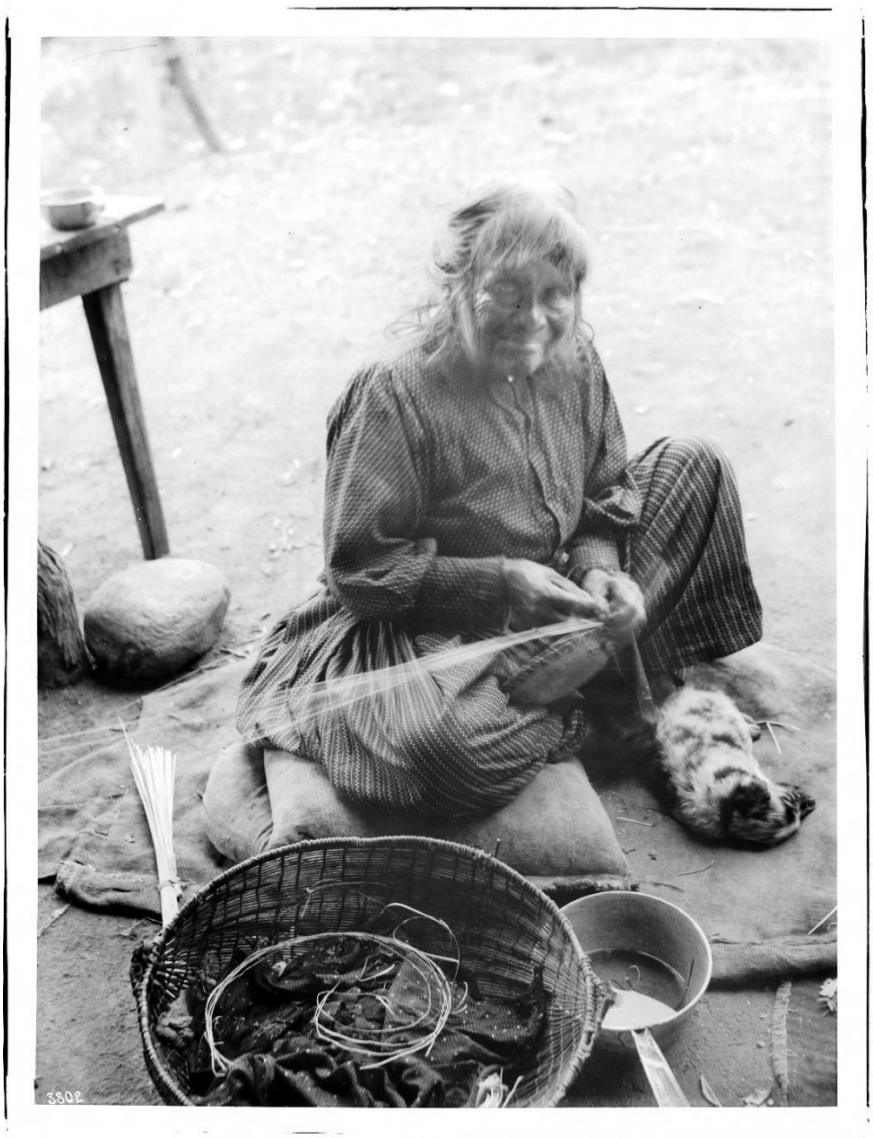

Figure 3-4 Yokuts woman weaving a coiled basket. Note the pot of water in the foreground used to moisten weaving materials, the long straight weaving materials by her side, and the twined basket in the left front of the photo, circa 1900 (James ca. 1900)

Twined Basketry

Several different types of basketry were constructed of twined works, most predominantly water bottles, but these also included acorn leaching trays, carrying baskets, and shallow waterproof canoe bailing baskets (Timbrook 2007: 97-101). Fernando Librado, a Chumash traditional practitioner and informant, stated that the '*esmu*

or *Juncus acatus* would be pulled whole from the ground, similar to the way other species were harvested, and be used in whole form for twining immediately after being harvested (Timbrook 2007:100). Harrington noted that twining using juncus was present among the Ineseño, Barbareño, Ventureño, Kitanemuk, Fernandeño, and Gabrieleño (Hudson and Blackburn 1987:233). It can be suggested that the Emigdiano also had a tradition of twining basketry based on the presence of twined basketry in the archaeological record in the Emigdiano region (Cockcroft 2015; Robinson et al. 2012). For the Chumash and the Kitanemuk, the starting knot at the base of the basket was comprised of four warps, or the vertical rods, around which the wefts, or sewing materials, were woven. The twining was clockwise when looking into the basket, similar to coiling directionality (Hudson and Blackburn 1987:233; Dean et al. 2004:36). A sketch Harrington made of Chumash twining technique is present in Hudson and Blackburn's work (1987:237). Based on descriptions, it appears that there were few if any tools needed to weave a twined juncus basket, however, this work would have been needed to be done shortly after the material was harvested. Twining with willow or sumac would take more preparation; however, it appears that this too would require few tools for the actual weaving of twined willow baskets.

Though weaving a twined basket does not appear to have required tools, many, such as water bottles, cups, and canoe bailers were made waterproof by tarring. This process of tarring baskets leaves an archaeological presence. First, the exterior of a basket was coated with a thick layer of mud. Dried chunks of asphaltum were pounded into small pieces and placed inside the basket, along with small hot stones or pebbles which had been heated in a fire. The stones and asphaltum were swirled around the inside of the

basket, with the hot pebbles melting the tar and coating the inside with a waterproof layer. The exterior mud acted as a wall so that any spaces in the weave were filled in solidly with tar all the way to the exterior of the basket, making is watertight (Timbrook 2007:100). Chunks of dried asphaltum or small pebbles with tar residue or evidence of heat treatment could indicate that some level of taring had occurred at an area (Brown and Vellanoweth 2014).

Just as there are many types of baskets, the time and effort put into weaving them varied greatly. Some coiled baskets could take months to prepare and weave (Dean et al. 2000; Anderson 2005). These baskets would be made for special purposes or intended to be used for decades. On the other side of the spectrum, some baskets would be made expediently as needed for particular purposes. As Delfina Cuero, a Kumeyaay woman who grew up learning traditional lifeways, indicated in her autobiography, "The greens and roots were cooked and then spread on the rocks to dry. If no rocks were near, the women would quickly twine some loose open baskets out of a tough green grass that grows in wet places. Then they would spread the cooked vegetable in them to dry" (Shipek 1991: 32).

Where Women Made Baskets

Direct discussion of where women engaged in the work of making baskets is rarely presented in the historic and ethnographic record. However, within the California Indian community, family traditions have been passed down from one basket weaver to the next regarding what plants to use, where to get them, how to prepare them, and how to weave with them. This knowledge, when graciously shared with interested, non-family

members, combined with historic documents and photographs, can be used to develop an understanding of the places women produced baskets.

Linguistics can offer some clues as to where women may have engaged in the different stages of basket production. One linguistic indication that specific stages of coiled basket production may have occurred at distinct locations was provided by Luisa Ygnacio *nut'u,* a Barbareño Chumash woman who worked with Harrington in the first quarter of the 20th century. Ygnacio told Harrington the word for 'I make coiled basketry' is *kaqni'ip* in the Ventureño and Barbareño dialect and that *aqnipmu'u* means 'a place where they sew basketry' (Hudson and Blackburn 1987:226). The word *aqnipmu'u* suggests that weaving was known to occur at specific places, indicating that there was a limited cultural space where women engaged in the act of weaving or that there were places that specialized in basket production. Additionally, at locations where juncus was known to grow, the Chumash word for juncus, *mexme'y*, was incorporated into the identifier, giving these spaces names which meant 'at the reeds' or 'place of the reeds' (Timbrook 2007:102-103). In this way, places like the town of *Kameckhme'y* were likely locations of harvesting juncus (Timbrook 2007:103). The presence of words that specify places in the physical and cultural landscape where different aspects of production occur are a strong indication that basket manufacture occurred in many different locations for different stages.

Prior to removal from their ancestral lands, women tended patches of resources, including plants for basket weaving (Anderson 1999, 2005; Latta 1977; Timbrook 2008). Women from tribes across California are known to have had their favorite harvesting locations (Dean et al 2004: 35). The work of pruning branches or manipulating root

growth in basketry plants required seasonal visitation to these places (Daniel McCarthy, personal communication 2015). This suggests that the locations of harvesting would likely have been within reasonable walking distance to the place where people spent their time at key pruning periods or where they spent most of the time through the year. Information provided by Yokuts informants and Thomas Jefferson Mayfield supports these observations. In the 1940s Yokuts from the San Joaquin Valley showed Latta one of their family sedge patches which they had been tending for generations (Latta 1977:538). Part of the reason people go back to the same location is that the process of tending plants becomes easier once they have been tamed in the first place and they are then easier to manage (Dean et al. 2000:35). When Mayfield lived with the *Choinumni* Yokuts, he recalled that the women would head out for a morning and afternoon and return home with harvested basketry plant materials (Latta 1976:60). However, Mayfield did not specify what kind of place they were living at, be it a seasonal camp or a village. Either way, plants were harvested and brought back to a main camp within a single day, suggesting these locales were nearby.

Locations where women processed plants for use in basketry are also not commonly discussed. When Harrington and Latta were learning about processing plants from their informants, this was usually at the home of the informants. Because traditional lifeways changed drastically after colonization, these observations do not directly reflect where women might have processed these plants in the past.

Crespí visited a Chumash village in 1769 and was able to see the interior of several houses. In his account of the incident, he wrote “There were women distributed among various lodgings within these houses, some of whom were grinding for gruel,

others toasting the seeds, and *others making baskets and bowls, made so finely out of rushes, with such patterns and pictures, as to strike one with wonder*" [Gamble 2008:113; emphasis added]. This indicates that, at least along the coast where some houses could fit as many as 60 people, women were engaged in making baskets inside. The account does not detail the stage of production, but Crespí's comment on designs suggest he at least saw objects in the later stages of weaving. An informal review of historic photographs, such as the one in Figure 3-4, showing California women engaged in basketry production often display them sitting in a chair or on a matt on the ground, near their home. However, these photographs were taken several decades or centuries after initial colonization, which drastically altered traditional lifeways.

Discussion

This review of California basketry studies reveals the complex role of baskets in prehistoric California lifeways. Further, it highlights the strengths and weaknesses of contemporary archaeological research around California basketry. Currently, it is known that women were the primary producers of basketry in the past and that basketry technology dates back to California as early as 9,000 years ago (Connolly 1995). Further, we know how the Chumash and other groups made baskets, including what plants they used, a general idea of how they used to be processed, and the traditional weaving techniques, based on information handed down through generations of crafts people, historic documentation, and the archaeological record.

This information is essential for informing interpretations about where women would harvest, process, and weave baskets and where we might expect to see these activities in pre-colonial contexts. However, the specifics of where women participated in

the act of preparing plant materials for weaving, or where the weaving actually occurred has not been discussed in detail in the ethnographic or archaeological literature. Ethnographic data indicates that in historic times, women worked at their homes, busily employed in weaving to produce baskets for family domestic pursuits and for the growing market for these beautifully crafted items. However, by this time native Californians had been deprived of their traditional lands and were not usually engaged in their traditional settlement patterns practices which included some level of seasonal mobility. The restricted mobility altered where women spent their time engaged in traditional craft production, limiting the connection of location of production between traditional past and ethnographic present.

It is worth exploring where women made basketry in traditional settings for several reasons. First, knowing where women worked in the past may hold insight regarding why certain traditions arose, such as plant material choice or processing tool choice. Second, knowing which sites were used by women to produce baskets provides a more complete understanding of how people in the past used the discrete places and spaces where they lived and worked. This information has implications for larger domestic and regional economic patterns. The review of archaeological evidence for production indicates that it may be possible to identify these locations based on nuanced interpretations of related artifact and feature assemblages.

While the presence of tools or features that could have association with basketry production are good indicators that such activities occurred at a location, it is also important to contextualize this data with known cultural patterns of landscape use, settlement patterns, and production styles. The following chapter outlines a possible

method for merging these different levels of data to create a model for basket production locations in the interior Chumash region.

CHAPTER 4: APPROACHES TO IDENTIFYING THE ORGANIZATION OF BASKET PRODUCTION

Scholarship on Chumash craft production is typically concerned with addressing the relationship between craft specialization and the emergence and character of complexity in hunter-gatherer groups (Arnold 1987; Gamble 2008; Hollimon 1990; King 1981). Studies of craft production have focused on high value items associated with wealthy elites, such as plank canoes and shell beads, including microdrills used to make the beads (Arnold 1987; Arnold and Bernard 2005; Gamble 2008; King 1981). The study of specialized crafts in Chumash literature has examined the control of production and distribution (Arnold 1987; Arnold and Bernard 2005), the timing and character of the emergence of specialization (Arnold 1987; Arnold 1992; Gamble 2008, King 1981; Hollimon 1990), and how craft specialization functions in exchange systems and sociopolitical systems.

What is less prominent in the discussion of Chumash craft production is the system of household craft production. A few individuals have asked questions about utilitarian craft production, seeking to identify locations of water proofing objects through tarring (Brown 2015; Brown and Vellanoweth 2014) or production of tule boats (Sunell 2013). However, there has been no formal discussion of the organization of basket production, one of the most essential crafts made and used by the Chumash. In California archaeology, baskets have been discussed in terms of basketry plant resource management and processing (Anderson 1999; Timbrook 2008; Dozier 2000; Farmer 2010; Hudson and Blackburn 1987), weaving methods and styles (Farmer 2010, 2012; Hudson and Blackburn 1987; Timbrook 2008), technology associated with basket

production (Hector 2006), cultural identity expressed in manufacture (Jordan and Shennan 2002, 2009), the social networks developed to sustain production (Dozier 2000) and division of labor associated with production (Hollimon 1990). However, these topics are covered in varying degrees of detail for different culture groups at different periods of time. Information maintained by contemporary basket weavers and previous research on Chumash basketry indicates that women were most likely the producers of basket crafts in the past and has identified the raw materials, tools, and knowledge that comprised basketry technology (Chapter 3). However, missing from this literature is thorough discussion of the scheduling of basket production in the daily, seasonal, or annual cycle, and the location of production prior to colonization, both of which provide social context for basketry and information about the daily lives of the craft producers.

This chapter provides a brief discussion of the purpose of studying craft production and outlines the attributes that make up a craft production system. The robust literature on craft production tends to focus on sedentary, agricultural, state and complex chiefdom societies, with little discussion of craft production systems in hunter-gatherer societies (Arnold et al. 2016; Sassaman 2008). The mobile nature of hunter-gatherer lifestyles is distinct from that of the sedentary agriculturalists who are most commonly the subject of craft production studies. Mobile societies warrant a modified approach to discussing craft production systems, incorporating the influence of seasonal movement on production. Hunter-gatherer settlement pattern literature provides insight as to how and why people move across the landscape in an annual cycle, revealing scheduling priorities and other influences on locations of production. Because hunter-gatherer settlement occurs across a landscape and through time, a landscape approach is adopted

and the concept of taskscape (Ingold 1993) is presented to conceptualize locations of production. Finally, an approach to conceptualizing basket production in the San Emigdio region is provided and used to make inferences about where basket production would be expected to occur.

The Study of Craft Production in the Archaeological Record

The study of craft production in the archaeological record illuminates the technological, organizational, and social aspects of production systems, identifies how craft production systems develop through time, and can be used to examine similarities and variation in craft production systems cross culturally (Costin 2005:1034). This information can be used to make inferences about the broader nature of social, economic, or political organization and change within cultures or between cultures (Bayman 1999; Costin 2005:1035; Sassaman 2008). While there is an extensive collection of literature around craft production in state or complex chiefdom level societies, the discussion of craft production in middle range societies such as simple chiefdoms with agricultural or hunter-gatherer subsistence strategies is more limited (Bayman 1999; Sassaman 2008; Pauketat 1987). Often, when discussed in middle range societal contexts, the focus is on identifying the nature of specialized or ritual craft production (Spielmann 2002; Sassaman 2008; Hagstrum 2001). However, as Cathy Costin (2005) points out, most objects made by people living in preindustrial societies serve utilitarian purposes, were made at the household level, and functioned as a form of social communication. No matter the structure of a group's sociopolitical organization, the study of craft production in past societies should describe the technological, human, and organizational aspects of

production and try to explain these facets of production in the historical context of the culture under study (Costin 2005:1036; Sassaman 2008; Pauketat 1987).

Craft Production Systems

Production systems can be most effectively studied by examining a set of six interconnected aspects of production. These are the artisans, or people who made the craft goods; the means of production, or raw materials, tools, and knowledge need to make crafts; the organization and social relations of production, or the physical and social way people are organized to produce goods and how they interact with consumers; the craft goods themselves, such as the form and function of the objects in society; the relations of distribution, or how crafts are transferred from producers to consumers; and the consumers of craft goods, which indicate the social role and value of the produced goods (Costin 2005: 1038-1039). This can be broken down into three main components which make up a craft production system: the technology, the artisan, and the organization (Costin 2005:1046).

The technological aspect of a production system concerns the knowledge, materials, and tools which are needed to make the craft (Costin 2005:1047). The raw materials, tools, and skills may be discussed in ethnographic literature, can be determined through experimental replication of production, and can be identified in the archaeological record (Costin 2005:1050-1051; Hurcombe 2008; Jolie and McBrinn 2010). Knowing how to identify the production sequence in the archaeological record is the basis for determining other aspects of production, such as time investment, temporal scheduling in the organization of production, and the function of production systems in sociopolitical complexity (Costin 2005:1051; McPherson Smith 2015). In the study of

hunter-gatherer societies, lithic tool production is most commonly discussed in terms of the technological components described here.

Equally important to understanding a craft production system is establishing the social identity of the producer or artisan. Factors such as gender, class, ethnicity, and locality influence the technology and the organization of production (Costin 2005:1053). For example, in Chumash society, it is understood that members of the elite class maintained exclusive access to the knowledge needed to build wood plank canoes and subsequently, ownership of these canoes were restricted to the elite (Arnold 1992). Basketry was a gendered craft in Chumash society, with women maintaining and passing down knowledge of how to tend, harvest, process, and weave. Additionally, Chumash women from the coast might use distinctive weaving materials or tools, such as sea grass and clam shell scrapers, that were geographically restricted to their homes, whereas, women from interior Chumash settlements might have used plants and tools more available in their region.

The organization of production can be separated into two main factors: temporal organization and spatial organization (Costin 2005: 1055-1059). Temporal organization refers to the scheduling of craft production in relation to other important social and economic pursuits (Costin 2005:1055). Crafting can be discussed in terms of full-time or part-time production and also as it relates to daily, seasonal, or annual scheduling of larger social processes (Costin 2005:1055; Hagstrum 2001). Full-time and part-time production can be used to illuminate the level of craft specialization. Full-time craft producers were specialized and sometimes attached to the elites managing political systems. Part-time craft production was typically undertaken in domestic settings with

varying degrees of individual specialization (Costin 2005; Hagstrum 2001). However, there is variation within the concept of full-time/part-time, attached/independent craft production as Ames (1995) evidenced in his discussion of embedded specialists on the Pacific Northwest coast. Embedded specialists maintain elite status themselves and participate in full-time craft production independent of ruling elites as part of their social role (Ames 1995). In craft production systems that do not have full-time specialists, scheduling of craft production is organized around prioritized activities, such as subsistence tasks, and by the division of labor (Costin 2005: 1056; Hagstrum 2001; Logan and Cruz 2014; Homsey-Messer 2015; Windes and McKenna 2001). In most complex and middle range societies, seasonal scheduling is generally found in part-time production strategies associated with independent or household level crafting (Costin 2005:1056).

The influences of seasonal availability and geographic circumscription of resources on craft production in middle range societies warrants further discussion. In their research on the archaeology of wood production in the construction of Great Houses in Chacoan society, Windes and McKenna (2001) demonstrated that tree harvesting was undertaken in relation to the seasonal farming schedule, in part because preferred trees with desired attributes were easily harvested in times of agricultural inactivity in late spring. Additionally, Windes and McKenna (2001) demonstrated that the process of felling, preparing, transporting, and using trees in construction occurred at particular times of year based on natural tree attributes. For example, the authors state that preferred trees had a four-month growing period starting in spring and ending in early fall, but that the best time to remove bark from a tree is in the spring when growth makes the bark

adhere less tightly. Additionally, leaving bark on a downed tree makes the wood less durable (Windes and McKenna 2001:125-6). Their research suggests that trees could be felled early in their growing season, when agricultural activities could be postponed and when it was easiest to remove bark, which needed to be stripped immediately, to produce good quality wood for house construction that did not interfere with agricultural needs. In another example from Chaco Canyon, Hagstrum (2001) examined the household craft economy (Bayman 1999) to identify how individuals organized a wide variety of farming, building, crafting, and cooking tasks in relation to one another. Using the concepts of complementary and intersection technologies, Hagstrum (2001:48-49), observed that certain crafts or tasks tend to complement each other in daily or seasonal cycles through being ideally scheduled at different times or by sharing similar technical knowledge or resource needs (2001:50).

The spatial organization of production is concerned with the locations where different production tasks occur (Costin 2005:1056). Knowing at what location production occurs informs the regional distribution of production. With direct evidence, an understanding of spatial organization can reveal the social context in which production is undertaken, and indicate the size and type of production system in place. The regional distribution of production can be studied by the identification of materials in situ associated with production, or indirectly inferred though an analysis of the physical characteristics of finished crafts (Costin 2005:1056). The identification of production locations can be challenging because the materials are not always observable in course grained archaeological analyses or because the indicators can be lost in the myriad of other site attributes (Costin 2005: 1057). Though challenging, making strong inferences

about locations of production is possible and provides important contextual information needed to make inferences about social patterns. For example, Windes and McKenna (2001) used the distribution of stone axes to demonstrate where people were cutting and processing wood for use in Great House construction, demonstrating that patterns appeared to vary by time period and location. Identifying where different regions retrieved wood and where they prepared it provides insights into the organization of labor, labor intensity, and other social aspects of production. Arnold and Bernard (2005) were able to use the presence of asphaltum, redwood, and chert drills to identify a likely *tomol* (plank canoe) construction location at a Chumash village. Identifying that production likely occurred in a major sedentary village on the coast supports the evidence that the *tomol* was a high value, high status item generally owned by elites (Arnold and Bernard 2005).

Hunter-Gatherer Mobility and Settlement Patterns

As stated earlier, the literature on craft production rarely considers mobile hunter-gatherers, focusing instead on sedentary or agricultural societies (Arnold et al. 2016; Sassaman 2008). Mobile settlement patterns, which have the potential to dramatically influence the organization of production, have not been taken into consideration when discussing location of production and seasonal scheduling of production in typical craft production system research. To address this, a review of literature regarding hunter-gatherer settlement patterns is needed, clarifying what factors influence seasonal mobility and what such settlement patterns look like.

Hunter-gatherer mobility strategies can be defined as the way in which a group moves across a landscape seasonally in an annual cycle to acquire resources (Kelly 1983:

27). In his work with the Nunamiut, Binford established some of the most influential method and theory used by archaeologists to interpret the way people living mobile traditional lifestyles use space to achieve a wide range of important subsistence and economic tasks (Binford 1980, 1981). With his work on hunter-gatherer settlement systems and site formation processes, Binford (1980) suggests that there are two main types of hunter-gatherer mobility strategies: residential and logistical. Residential mobility strategies are employed by foragers who 'map on' to a landscape by moving the group from resource patch to resource patch through the course of the year. Logistical mobility strategies are employed by collectors, who move resources to a centrally located habitation area using variable logistical expeditions throughout the year (Binford 1980). It has been suggested that the primary motivating factor for the type of mobility strategy groups employ is the location and availability of resource patches (Binford 1980; Kelly 1983). Binford argued that more seasonal variation in temperature, and thus, a shorter growing season for plants, increases the need for reliance on stored plant resources. This combination of temperature variation, short growing season, and storage appears to lead to reduced settlement mobility (Binford 1980:15). Collectors, as described by Binford, may employ any number of logistical mobility strategies which tend to range between semi-sedentary and sedentary. In his description of semi-sedentary systems, Ames states that residential sites "are not occupied for all seasons of the year, even though their residential settlement systems may be as permanent in the landscape as those of agricultural or industrial societies" (1991:109). Ames also asserts that both sedentism and semi-sedentism can be practiced at the same time within a region (1991:110). Because the Chumash fall into the category of 'collectors', who practice a range of sedentary and

semi-sedentary mobility patterns (Horne 1981; McRae 1999), the following discussion will focus more on this logistical strategy of hunter-gatherer mobility (see Binford 1980).

Binford (1982) examined the location and distribution of activities across a logistical 'collector' group's territory in their seasonal round of movement to understand larger economic and social systems. Binford argues that to understand the past we must understand the place, because site patterns are developed through long-term repeated use of a landscape adapted to local geography (Binford 1982:6). In this work, Binford argued that 'economic zonation' is a mixture of both biogeography and cultural geography that can be used to break down general patterns of how people used their environments (1982:6-7). Binford sets up a model of five expanding, non-concentric increments of differential territory use that expand outward from a basecamp, which may be permanent or seasonal. The first or central zone is the **Play radius**, which is not for resource procurement, but for residence. Next, expanding outward is the **foraging radius**, rarely more than 6 miles from residential base, which people exploit for economic needs but from which people can return home in a day. Next is the **logistical radius**, exploited by task groups with the intention of overnight or extended camping before return to residential base. Following this is the **extended range**, which is much broader and is used sparingly by people who visit these distant regions to maintain knowledge of resource productivity in the areas that are not used regularly. The final sphere of use is the **visiting zone**, places occupied by relatives, trading partners and so on (Binford 1982:7).

Mobility patterns indicate how people likely utilized places economically. The transition of a base camp located in the foraging radius from one spot on the landscape to another is influenced by changes in season and availability of resources. This transition

will alter the location of the foraging radius and the various surrounding economic zones as well. Meaning, when a group moves from one camp to another, the economic zones also shift to encompass the new location. Conversely, the former habitation site and original foraging radius is thus relegated to a temporarily less used radius. However, people may still return to use the previous base camp for logistical foraging purposes, thus the site exhibits multiple functions in a single seasonal round (Binford 1982). Ultimately, Binford states that to make larger observations about social evolution and culture systems "we must turn our analytical attention to understanding the role of different places in the organization of past systems" (Binford 1982:29). Settlement mobility is a product of cultural, technological, and environmental factors, which influence the way a community uses places in their territory.

Clearly, economic subsistence activities in hunter-gatherer societies are linked to both seasonal movement and place. Binford, and other proponents of New Archaeology in particular, embraced the study of settlement systems by emphasizing that the landscape, the spaces of cultural activity and between cultural activity, are the level at which social practices must be understood (Anschuetz et al. 2001: 170-171). However, these settlement approaches tend to focus on subsistence activities as the primary factor influencing site patterning. The recognition that sites exist beyond utilitarian purposes and that symbolic meaning given to places was of equal importance was a major development in the theory of studying the cultural landscape (Anschuetz et al. 2001:173-4).

Landscape Archaeology

Archaeologists have been interested in the study of space, and thus landscapes, from the start of the discipline (Knapp and Ashmore 1999:1). Archaeological interest in place has taken many forms through several different paradigms, however, the establishment of an explicitly landscape based approach has benefited many aspects of archaeological research (Anschuetz et al. 2001). Landscape archaeology is an active set of methods that are ideally suited to aid in developing a fuller understanding of cultural and historical processes in the past, rather than relying on any single theoretical approach (Anschuetz et al. 2001:160). Anschuetz and colleagues lay out a four-part definition of the landscape paradigm that guides this research. First, landscapes are not directly correlated to natural environments, but rather are a culturally constructed way of interacting with the natural environment (Anschuetz et al 2001:160). Next, landscapes are cultural products that are given meaning through a community's activities, beliefs, and values (Anschuetz et al. 2001:161). As Ingold states, "the landscape is the world as it is known to those who dwell therein, who inhabit its places and journey along the paths connecting them" (Ingold 1993:156). Third, landscapes encompass all human activity across culturally organized conceptions and non-culturally organized resources (Anschuetz et al. 2001:161). Finally, landscapes are fluid in that they are used and modified distinctly by communities through generations (Anschuetz et al 2001:161).

The power of this paradigm is that it invites the study of sites across a region and through time by recognizing that archaeological sites and human actions should not be interpreted in isolation. By recognizing that the landscape is a product of a community's activities and values, patterns of locations for human activity in the landscape and patches

void of human activity in the landscape are informative about cultural traditions and, conversely, can potentially be anticipated from known cultural patterns. In this way, the observed material culture patterns can be thought of as the actions of thinking people and not, as has been a problem in the past, as automatons moving about the world reacting to places and situations (Anschuetz et al 2001: 162).

Taskscapes: Craft Production in Mobile Hunter-Gatherer Society

Landscape archaeology is well suited to serve as a medium in which to connect the study of craft production systems and mobile hunter-gatherer societies. Tim Ingold's (1993) taskscape theory, an axial concept where these distinct theoretical approaches combine well, proves useful for organizing the relationship between mobility and production. As both Ingold and Binford discuss the use of space through time, it is pertinent to compare the two theorists to highlight the distinct advantages of taskscape theory.

Both Binford and Ingold assert that a cultural system cannot be understood without analyzing the spatial distribution of the various components of the system or activity. However, for Binford (1982), the underlying system of interest was usually the subsistence economy, visible through an evaluation of the distribution of site types in an environment used logistically for hunting, gathering, fishing or any combination thereof. Ingold holds a different, more holistic view of the landscape, contemplating all the acts of life, not strictly subsistence activities, in understanding how people use places. Ingold writes:

> "A place owes its character to the experiences it affords to those who spend time there - to the sights, sounds and indeed smells that constitute its specific ambience. And these, in turn, depend on the kinds of activities in which its

> inhabitants engage. It is from this relational context of people's engagement with the world, in the business of dwelling, that each place draws its unique significance. Thus whereas with space, meanings are attached to the world, with the landscape they are gathered from it" (Ingold 1993:156).

Another similarity between the two theorists lies in the importance of time in their discussion of how groups use the landscape. Binford is interested in settlement mobility through the seasonal round. The places people move to at different times of the year are shaped by subsistence needs, such as following herd animals for the Nunamiut (Binford 1982), or moving upland to gather acorns in the autumn for the Chumash. Binford also states that these seasonal patterns are shaped by repetition through long periods of time (1982:7).

Ingold perceives of time not strictly by the seasonal movement of people across a place, but in terms of temporality, or the process through which landscape is engaged with by organisms. The concept of temporality used by Ingold (1993:157-159) asserts that the passage of time is intrinsic to events, in that events occur with relation to what preceded and take into account what will happen in the future. In this way, time is defined in social terms. It is in these historical and chronological contextualized settings that people make decisions about how they do the things they do. The things people do, also termed tasks, "are the constitutive acts of dwelling" (Ingold 1993:157). A task is any operation done by an individual in a place as part of typical daily life (Ingold 1993:158). Just as tasks are inherently linked to time, so too are they linked to place.

Ingold merges his definition of landscape with the contextualized concept of dwelling to create the idea of a taskscape. It is Ingold's conception of the taskscape that separates his thinking from Binford. Ingold writes:

> "Every task takes its meaning from its position within an ensemble of tasks, performed in series or in parallel, and usually by many people working together. One of the great mistakes of recent anthropology … has been to insist upon a separation between the domains of technical and social activity, a separation that has blinded us to the fact that one of the outstanding features of human technical practices lies in their embeddedness in the current of sociality. It is to the entire ensemble of tasks, in their mutual interlocking, that I refer by the concept of taskscape. Just as the landscape is an array of related features, so - by analogy - the taskscape is an array of related activities." (Ingold 1993:158).

A taskscape can be defined as the intangible, lived actions of individuals, undertaken in the process of accomplishing a task from start to finish, which invariably occur across space and time, and which are influenced by a myriad of other tasks occurring both simultaneously and chronologically. The taskscape of an item or an act may incorporate different people at different places at different times and may be influenced by other tasks in which people are also engaged. Archaeologically, the landscape represents the collapsed taskscape in that the landscape is the tangible setting in which the past actions of people have left traces in the form of sites, features, artifacts, and sacred spaces (Ingold 1993:162).

Having addressed the major components of the taskscape concept, there are two social elements that are intrinsic to taskscapes that require further discussion: social time and division of labor. An important aspect of the taskscape as it relates to time is that it is not measured by the clock, but by the society (Ingold 1993). Logan and Cruz (2014) assert that a Western, capitalist conception of time is usually seen as labor-time, perceived of as a commodity. However, non-Western time "is more often tied to daily, seasonal, and weekly cycles of activities" (Logan and Cruz 2014). The taskscape concept

considers time as it is experienced socially, pertaining to each action or step in a task. Broadly, social time for hunter-gatherer societies can be perceived of as the seasonal mobility cycle, as Binford pointed out (1982), but must consider the range of tasks that are associated with this cycle, beyond subsistence needs.

Importantly, the social time in seasonally mobile hunter-gatherers will not only vary cross-culturally, but also within a culture, demographically. In other words, the division of labor will determine the nature of social time for different segments of a society. For many hunter-gatherer societies, the division of labor tends to fall along gendered lines (Hollimon 1990). Because of this, women can be thought to participate in distinctive seasonal patterns which are influenced by their daily tasks, be they related to food preparation, craft production, or any other socially influenced action. Further, these gendered differences in activities through a seasonal cycle will also likely exhibit spatial differences both affected by the mobility of the society and the identity of the individual.

Organization of Hunter-Gatherer Craft Production

Having briefly reviewed literature regarding craft production, Hunter-Gather settlement patterns, and the concept of taskscape, it is now possible to return to the discussion of the organization of craft production in hunter-gatherer societies. For the purposes of this project, organization refers to the temporal scheduling and spatial distribution of production (Costin 2005). Craft production in hunter-gatherer groups is almost always a part-time activity undertaken in relation to other important economic activities (Arnold 1987; Sassaman 2008). These economic activities are accomplished through mobile settlement strategies in which groups move to various locations in their territory to take advantage of differentially available resources throughout the year

(Binford 1980, 1982; Kelly 1983). These resources should not be strictly conceived of as food or as materials needed to maintain tools, but rather, should be seen as complex sets of economically and socially desired materials. Thus, the spatial distribution of craft production will be linked to the seasonal movement of people across the landscape as dictated by cultural tradition, social need, and resource availability in time and space. While subsistence-related activities such as hunting game and gathering, processing, and storing plant food resources may have been primary movers of people across the landscape, other important tasks such as craft production are also key aspects of this mobility or are conducted in relation to this mobility. Because some craft production tasks have seasonal resource availability restrictions or intensive labor investment requirements that must be scheduled, it is possible that distinct stages of craft production may occur at different types of sites occupied at different times of the year.

Another essential aspect of hunter-gatherer craft production is the gendered division of labor. Because different genders engage in distinctive economic activities, the way they schedule their time and engagement in craft production is also different (Cruz and Logan 2014). In addition, the different economic activities of men and women influence where craft production takes place (Sassaman 2008). To better understand the influences shaping women's part-time basketry craft production, a pattern assumed based on ethnographic data (Hudson and Blackburn 1987) and archaeological research (Arnold 1987), it is necessary to understand what major tasks women participate in throughout the year and how women tend to schedule craft production with other economic activities.

In their archaeological and ethnographic analysis of taskscapes relating to food and pottery production in an agricultural community in Banda, Logan and Cruz found

that the time and technique for each type of task were patterned along the gendered nature of the tasks (Cruz and Logan 2014). Essentially, Logan and Cruz found that home and craft tasks of women were conducted in relation to the primary task of farming, which takes priority over other tasks in social life given its economic importance. This is also the case with hunter-gatherer societies, although instead of sedentary farming, this gendered organization is scheduled in the mobile settlement pattern.

However, Logan and Cruz also observe that subsistence organization can change, depending on social needs, and is not fully environmentally determined. This is also probable in hunter-gatherer groups, with variation in plant harvesting locations and times dependent upon other social needs or constraints undertaken within the window of opportunity for economic production. In their discussion of pottery production, a task predominantly done by women who build and sell the pots but who are prohibited from gathering the clay, Logan and Cruz note that socially observed rules follow the needed rhythms of farming. For example, women in Banda stated that pots should not be made in the dry season (also the season for field preparation and planting), because they believe the seasonal winds will dry and crack the pots. However, experienced potters indicated it is possible to make pots at this time, suggesting that the justification for not making pots during field preparation and planting is a strictly social one (Logan and Cruz 2014).

There are numerous examples of similar tradeoffs in task schedules between technological developments or social need in more mobile societies. Eerkens and colleagues observed that among the Paiute of eastern California, a transition to a more labor-intensive harvesting strategy for Pinyon Pine nuts might have occurred as a result of the development of irrigation for other plant resources, which caused a conflict with

previous subsistence schedules (Eerkens et al. 2004:24). In a similar trajectory but focused on engendered scheduling, Whelan and colleagues argue that food storage patterns among California hunter-gatherer in the Sierra Nevada region were likely shaped by the gendered nature of plant gathering tasks and the need to balance foraging and storage with other important tasks such as child care (Whelan et al. 2013). Women's production roles were influenced by cultural traditions, social needs, and resource availability and distribution.

In her review of rock shelter and cave use in the Archaic mid-south, Homsey-Messer (2015) discussed the concept of engendered taskscapes from a hunter-gatherer perspective. In this work, Homsey-Messer asserted that the landscape is gendered and that certain site types can be perceived as components of gendered taskscapes (2015:347). Following Homsey-Messer's the line of reasoning, mid-south cave sites represent women's nut processing locales in the middle Archaic period, which indicated that nearby, women were maintaining plant resource patches, and while working, cultivated memories and meanings for these places that were female. In this way, the caves and the surrounding foraging areas represent locations of gendered taskscapes. Homsey-Messer also points to other work in the south that indicates bedrock mortars were also women owned and represented another form of gendered taskscape (Homsey-Messer 2015:347-8). In California, milling sites are strongly tied to women's activities (Dick-Bissonnette 1997; Jackson 1991; Jones 1996; Leftwich 2010; McGuire and Hildebrandt 1994; Rucks 1995; Whelan et al. 2013). Therefore, tasks associated with women's roles may be more likely to occur at these places within the gendered taskscape of subsistence plant processing (Robinson 2006).

Modeling Emigdiano Basket Production Location Distribution

This discussion of craft production, hunter-gatherer mobility, and taskscapes provides the framework in which basketry production locations have been conceptualized for this project. The dynamic nature of creating a basket is structured in many steps that cannot always occur in rapid succession. Each step requires a unique set of natural resources and settings imbued with meaning by the people who used them. A basket represents various time and labor investments by women, that likely occurred at different times or locations due to the nature of the availability of basketry resources and the need to schedule production around other important activities that had their own temporal constraints. The mobility associated with accomplishing some of these other important activities also indicates that different basketry tasks may have been conducted in various locations.

Modeling how women organized basket production in the past cannot be done with a simple formula. The evaluation of potential production locations must consider known Chumash settlement patterns, basketry plant seasonality, and gendered production practices. Below is a discussion of data from the San Emigdio region and other nearby areas which are used to evaluate the potential of site types considered in this thesis to be used in basket production.

Interior Chumash Site Type Use and Seasonal Settlement Patterns

In his examination of interior Chumash site distribution patterns, Horne (1981) developed a seasonal settlement pattern model for the region (1981:136). It should be noted that Horne acknowledges, and I agree, this model is not rigid and may not reflect patterns in all interior Chumash areas. As an example, a large cultural resource

management report indicated that site distribution and settlement patterns were slightly varied from one end of Cuyama valley to the other (Mikkelsen et al. 2014a). Horne's model is presented as a set of hypotheses based on ethnohistoric data, subsistence practices, and a rational choice framework. This model was built around known archaeological and historical data for the village of *Hawamiw*, along the Sisquoc River, between Santa Barbara and Cuyama valley, but was not tested through additional survey or excavation efforts.

Horne's first hypothesis states that interior Chumash people would have lived at villages from late fall to mid-spring, when most plant resources were unavailable (1981:130). Ethnographic documentation in the early 1880s at the village of *Kastiq* indicates that the village population was low in the summer and much higher in November (Horne 1981:131). Horne's second hypothesis asserts that seasonal dispersal of villages would have occurred in late spring and summer to take advantage of plant foods that were diffused over wide areas of the territory (1981:132). Horne asserts that the winter village broke up into summer villages where the primary economic activities consisted of food collection, processing, and storage (1981:132). In the summer of 1806 when Zalvidea traveled through the interior Chumash region, many of the villages he encountered, including *Tashlipun*, were empty or had limited populations present (Horne 1981:133; Bernard 2008). Zalvidea also encountered villagers at the Yokuts encampment of *Sisupistu* where only about 50 to 60 people remained and the majority were "away gathering their harvests" (Horne 1982:133). Horne's third hypothesis assumed that late summer and fall crops, such as acorns and pine nuts, were available at the same time but

in different areas, requiring the need for groups at summer villages to break into smaller family sized groups to strategically harvest different resources (1981:133-135).

This model suggests that base villages were occupied by all members of the village in winter and early spring when they relied on stored foods and nearby available resources (Horne 1981:143-145). In summer, widespread ripening of plants across a variety of environmental zones led communities to break up into subgroups to take advantage of these resources. These subsets of the community would occupy summer or seasonal villages where much food would be amassed (1981:145-6). In the fall, the abundant and dispersed plant resources would become less available and the environmentally restricted resources of acorns and pine nuts became available. Early fall would be a time when summer villages divided into small family groups who would take advantage of these resources and return to the seasonal villages. Towards the end of fall, the community would congregate again at the main village in time to celebrate the harvest with the *Hutash* festival (Horne 1981:147-8).

For the Emigdiano Chumash territory, work has not been explicitly done on seasonal settlement patterns; however, inter-site mobility has been studied and can be used to generate information concerning potential seasonal patterns of site use. Robinson and Wienhold (2016) have essentially created a type of economic zonation map for the Emigdiano region. In this research, GIS was used to create isochrones, which use geographic information such as slope and direction, along with Tobler's hiking function, which estimates average walking speeds, to establish the time it would take to reach any location from any of the three villages in the Emigdiano Chumash area (Robinson and Wienhold 2016). Broken up into four-time range intervals (0.002 to 4 hours, 5 to 8 hours,

9 to 12 hours, and 13-16 hours), these isochrones can be correlated to Binford's foraging radius, logistical radius, extended range zone, and visiting zone, respectively (Figure 4-1). The isochrones are useful in that they do not assume pathways, allowing room for the agency of individuals who would have selected paths unknown to archaeologists today, to get to specific places on the terrain (Robinson and Wienhold 2016).

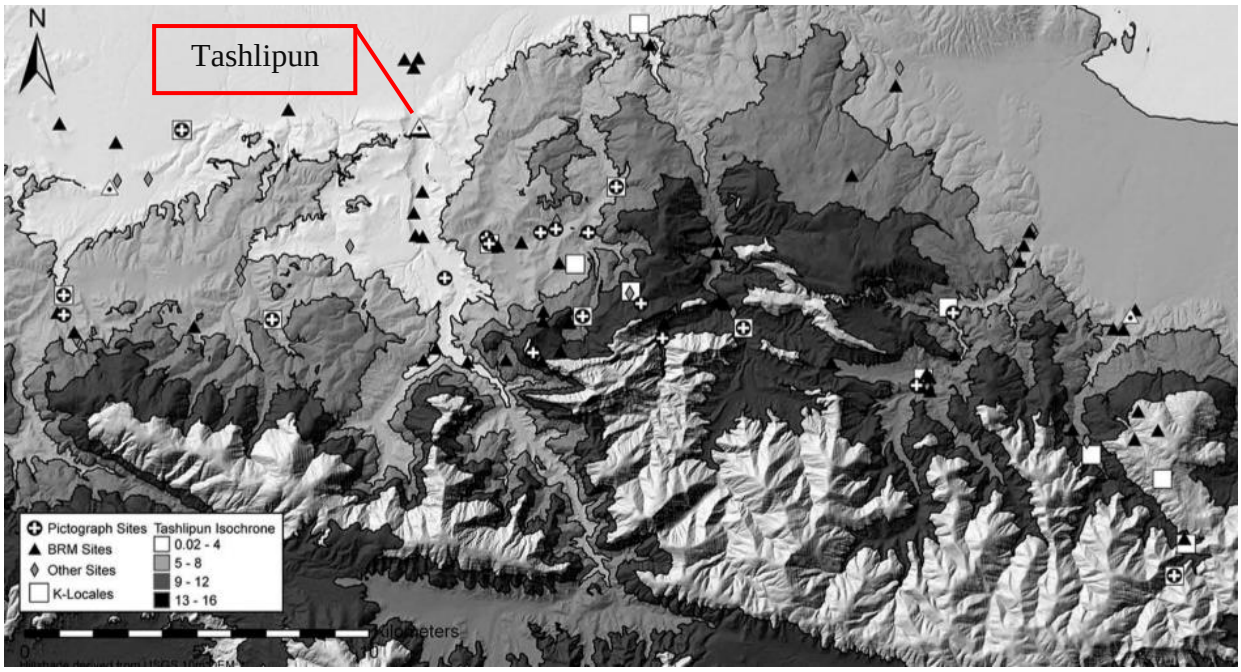

Figure 4-1 Isochrone Map of Tashlipun indicating walking distances at different time intervals. Tashlipun is demarcated by the central white triangle with the dot in the center (Robinson and Wienhold 2016:9)

In this line of thinking, the village of *Tashlipun* represents Binford's basecamp or Horne's base village, with San Emigdio Canyon comprising the foraging radius that would have been used in winter and early spring. The Pond Site represents a locale that straddles the edge of the foraging zone and the logistical zone. This suggests Pond could have been used by people living at *Tashlipun* who traveled to the site in local foraging activities, and/or that it was a place where people from *Tashlipun* moved to for a set time during their seasonal round, potentially as a seasonal or summer village (Robinson 2010).

Three Springs is located firmly in the logistical zone. This means that people would likely have only used the site for logistical resource gathering trips where they intended to be away from the village for a period of time, or that, like Pond, it was a place where *Tashlipun* villagers lived during summer and fall when local resources near Three Springs were available (Robinson 2010). While people living in the village of *Tashlipun* likely utilized these sites, Cache Cave is located further upland and eastward. The isochrone data indicates this site is in the extended range or visiting zone for the village of *Tashlipun* and in the extended range for the village of *Tecuya* (Robinson and Wienhold 2016).

However, as Binford states, mobility defines the center of the economic zones. For California hunter-gatherers living in foothill environments, summer and fall were usually times of dispersal from the village basecamp, for hunting and harvesting purposes, often in upland environments (Horne 1981). Tribelets would regroup at set locations in higher elevations, forming seasonal villages and temporary camps for the harvesting season. This annual pattern of movement would also adjust the foraging and logistical radii of the Emigdiano Chumash families from *Tashlipun* to another preferred upland site for a temporary time. This means that people who moved to Three Springs or Pond in the summer or fall established those places as residential base camps, transitioning Cache Cave to a place in the logistical zone for the people who likely came from *Tashlipun*.

This review of Emigdiano seasonal settlement patterns is necessary to evaluate the organization of basket production and identify potential production locales. Scheduling of craft production for hunter-gatherer groups is anticipated to be patterned in

relation to primary subsistence schedules which shape seasonal mobility (Binford 1980). Knowing where people were likely spending time at any given point in the annual cycle allows for predictions to be made about production locations. The organization of Emigdiano Chumash basket production is modeled using the concept of taskscape, which incorporates spatial differentiation of activities, seasonal settlement patterns, and engendered production, to predict where women may have engaged in different stages of production. The following sections use theory, archaeological data, and ethnographic accounts to model when and where each stage of production might have occurred.

Proposed Harvesting Locales

The plants considered in this analysis include juncus, sumac, willow, and deer grass. Based on the known seasonal availability of plants and Horne's (1981) model for site use in the seasonal round, Table 4-1 provides an indication of where people would have been when plants are available for harvest:

Table 4-1. Seasonal Site Use and Basketry Plant Availability

Season	Utilized Sites		Basketry Plant Harvest Schedule		
	Occupation Sites	Special Use Sites	Juncus	Sumac/Willow	Deer Grass
Winter	Base Village	--	Available for Harvest	Available for Harvest	Not Harvested
Spring	Base Village	Food Processing Sites	Available for Harvest	Pruned/ Not Harvested	Not Harvested
Early Summer	Base Village	Food Processing Sites	Available for Harvest	Not Harvested	Not Harvested
Late Summer	Summer Village	Food Processing Sites, Food and Water Caches	Preferred Harvest	Preferred Harvest	Available for Harvest
Early Fall	Summer Village	Food Processing Sites, Food and Water Caches	Preferred Harvest	Preferred Harvest	Available for Harvest
Late Fall	Base Village	Piñon Pine Nut and Acorn Camps, Food Processing Sites	Available for Harvest	Available for Harvest	Available for Harvest

These plants grow in distinct habitats and require different harvesting methods. However, it appears that there is some overlap in harvesting times. The late summer and early fall are known to be times preferred for harvesting each plant, depending on the culture and region. Juncus can be harvested at any time of year. However, the rich red base prized for decoration only develops at the end of the summer or the start of autumn. It has also been stated that this red color was obtained from juncus growing at higher elevations above 3,000 ft. in canyons that also fostered the growth of sycamore and willow (USDA 2003a). This suggests that juncus might have been harvested at higher elevations later in the year; this is consistent with mobility patterns that suggest people would have dispersed upland to harvest acorns in fall. Juncus might have been harvested within the foraging radius of seasonal villages or camps in upland settings.

Willow and sumac appear to have a wider range of preferred harvesting seasons, dependent upon cultural practices, ranging from late summer to winter (Farmer 2012; USDA 2003b). The preferential time for harvest was also in the late summer and early fall, though material could still have been harvested through winter until spring. In this case, willow and sumac could have been harvested at many different locations throughout the year, including around the village, seasonal camp, or special use sites. However, it appears that preferred harvest times were when people had likely moved into seasonal villages or camps, or dispersed to smaller family camps. Deer grass appears to have been preferentially harvested from summer to fall, suggesting that it would have more likely been gathered near seasonal camps or special use areas.

These plant harvesting times overlap with the season for harvesting many other important plant food resources used by the Emigdiano Chumash (Timbrook 2008). The

fact that similar activities, knowledge, and locations are associated with both food and craft plant harvesting, both done by women, indicates that these activities may have been complimentary and intersecting tasks (Hagstrum 2001), scheduled together.

Latta recounts stories from Thomas Jefferson Mayfield, an early pioneer of the San Joaquin Valley who lived with a tribe of Yokuts for many years as a child in the late 1800s. In this account, Mayfield states that women would go out during the day to collect basketry materials among other items and bring them back to camp later in the day (Latta 1976). However, the details of gathering and weaving were not remembered well or known by Mayfield who was a young boy at the time of his experiences (Mayfield 1993:15). Unfortunately, these accounts do not state what time of year these plants were gathered or what type of settlement he and the Yokuts were living in when these plant-gathering forays occurred. Mayfield's account suggests though, that harvesting took place in the foraging radius of the residential base, since the women returned before the day was out. Additionally, the fact that women brought back both basketry plant materials and other resources supports the intersecting and complementary nature of basket production scheduling with other subsistence tasks. It should be noted that the *Choinumni* Yokuts, who Mayfield stayed with, lived at slightly lower elevations than the Emigdiano and thus, likely had a different type of seasonal round, particularly because they were precluded from heading into the upper elevations by the tribes living in the foothills with whom they did not have good relations (Latta 1976). Additionally, this account does not indicate what types of plants were collected or in what state they were brought back. In any case, it appears that harvesting of common, locally available plants used in basketry may have occurred within the foraging or logistical zones of the occupied base camp.

In sum, juncus, willow, sumac, and deer grass were most likely to be harvested near seasonal villages around late summer and early fall. All of these plants were in their prime for use in basketry at this time of year when Native California women were engaged in the harvesting and processing of many plant materials in the foothills. While engaged in these and other activities, families were living at seasonal villages or temporary camps which would have tools and features necessary for plant processing, such as BRMs. Based on plant availability and settlement patterns, this model predicts that the Emigdiano Chumash seasonal habitation sites of Pond and Three Springs are most likely to have been occupied when plants were harvested.

Proposed Processing Locales

Processing plants also occurred in different ways at different times after materials were harvested. Juncus intended for coiled basketry was typically dried for an extended period after harvesting, deer grass processing has no time constraints, and woody plants such as willow and sumac required relatively immediate processing. Because willow and sumac must be processed shortly after they are harvested, there is a greater likelihood that they would have been processed closer to where they were harvested. Therefore, sites located near these plant resources that exhibit archaeological assemblages containing knives, flakes used to cut and scrape wood, and paleobotanical remains of these plants could have served as harvesting and processing locales. The wide possibilities of harvesting periods indicate that these processing locales could be near winter villages if plants were harvesting in winter or early spring, seasonal villages if boughs were cut in summer or fall, or other types of temporary use sites associated with these two base camp types, depending upon time of harvest.

In contrast, juncus processing is not tied to harvesting location. These plants typically needed to be dried for a few weeks to several months prior to final processing for coiled basketry (Chapter 3). If plants were harvested in late summer then they would be ready for processing in early fall, both tasks likely occurring while people were using seasonal villages as their residential base. However, if material was harvested in early fall it could have been processed in late fall when people likely congregated upland to harvest acorns and pine nuts, or less likely in early winter on their way back to the main village. The potential variation possible in the processing of these plants indicates that identifying the presence of processing tools and plant remains is the best way to distinguish processing locales from other sites that people were living in at the time.

To summarize, if harvested during preferred period, juncus could have been processed in late fall or early winter and willow and sumac would have been processed in late summer or early fall. During these periods of time women would have continued to be engaged in harvesting and preparing available plant food resources, shifting focus from small seeds earlier in the spring, summer and fall, to acorns and pine nuts in the fall. These resources with later harvesting times are available at higher elevations, suggesting families were living at foothill seasonal villages or upland temporary camps. The model predicts that processing was most likely to occur at the seasonal habitation sites of Pond, and Three Springs, or at the upland site of Cache Cave. Emigdiano Chumash women could have scheduled the processing of basketry plants at the foothill seasonal habitation sites of Pond and Three Springs, where they likely harvested basketry plants and were already spending time processing plant food resources. Both woody plants or juncus could have been processed here, depending on the time they were harvested. Or, women

could have scheduled in basketry plant processing at Cache Cave, where important food resources available late in the harvesting season brought people upland. Because Cache Cave was occupied later in the year, juncus could have dried from harvesting earlier in the season in the foothills, and been ready to be processed by the time they were living around the Cache Cave area.

Proposed Storage Locales

There is considerable time lapse in the collection, harvesting, and use of some basketry plants, particularly juncus (Timbrook 20008; Hudson and Blackburn 1987). Whether plants are left to dry before they are processed or stored after processing for a time when they are needed, this step has certain requirements. Timbrook (2008), Latta (1976), and Farmer (2012) note that cool dry places were used to store basketry plants and fibers that were not in use. These cool dry places could consist of temporary structures such as sun shades, more permanent living structures, or natural storage areas such as rock shelters or caves. In this way, sites that exhibit natural cool dry spaces could have been used for storage and places with evidence of structures could also have been used for storage.

Basketry plant storage could occur at any location, depending on the stage of plant processing. Unprocessed juncus is more likely to be stored at seasonal villages or upland sites while processed juncus could be stored at any location. The model predicts that Pond, Three Springs, and Cache Cave have the greatest potential to be used to store unprocessed juncus and processed juncus and *Tashlipun* was likely used to store processed plant materials.

Proposed Weaving and Finishing Locales

Binford (1982) states that residential base camps are where people spend the most time engaged in different pursuits and are more likely to exhibit a rich and heterogeneous assemblage of archaeological materials that are reflective of these tasks. In thinking about basket production, this can be corroborated with the fact that many Chumash village assemblages exhibit evidence of a wide variety of productive activities (Gamble 2008; Hollimon 1991; Horne 1981). Several Chumash villages that have been identified and analyzed exhibit a plethora of tarring pebbles and awls. These items represent the activities of weaving baskets and water sealing completed baskets (McRae 1999; Gamble 1991). This suggests that later stages of production are most likely to be observed in villages where people spend greater amounts of time and accumulate a wider variety of material goods for many different activities. However, efforts to identify other types of basketry tools, such as utilized flakes or shell, and features associated with tanning or drying materials appear to be limited or nonexistent, skewing data on production stages for these locations.

Work by Brown and Vellanoweth indicates that villages are not the only location of tarring, however (2014). In their work on the Channel Islands, Brown and Vellanoweth observed that sources of natural asphaltum were also places where people would tar baskets. Further, work by Sunell (2013) indicates that tule for *bolsa* boats was likely harvested, processed and constructed in locations of resource availability. This suggests that the presence of resources may also be an indicator that an area was used by individuals in later stages of craft production. However, presence does not equal use and the larger cultural function of the setting must be understood to make interpretations.

Little work has been done to identify the presence of other, early stages of basketry production, such as harvesting or processing of plants, making it a challenge to determine if this was an activity conducted near a village site or at other foraging or logistical sites.

In any case, the model predicts that basket weaving and tarring of completed basketry is most likely to be conducted at winter villages when there was more time for non-subsistence related tasks and women had the time to weave, and when the materials had already been harvested or processed. In the Emigdiano case study, *Tashlipun* has the greatest potential to have been a place of basket weaving and tarring. The presence of late stage productive tools and absence of earlier stage tools at sites will indicate if this prediction is accurate.

Summary

To summarize, given what is known about historical and modern Chumash basketmaking and prehistoric settlement patterns, I expect to find evidence for harvesting basketry plants at seasonal village sites, evidence for basketry plant processing at seasonal villages and upland sites, and evidence for weaving and water proofing at village locations. Storage has the potential to occur at any type of site, with unprocessed materials stored where they were harvested or processed, and processed plants stored at any location.

Harvesting basketry plants is likely to have been scheduled with the harvesting of other plant resources, activities which commonly occurred in the late summer and early fall when people were living in the foothill seasonal villages. Processing basketry plant materials was variable, with woody plants needing to be processed shortly after harvest and juncus needing to be dried for several weeks or month before processing. Since both

types were likely harvested around seasonal villages, depending on how early in the season, processing of juncus, willow, and sumac could all have occurred at the seasonal village or habitation site. However, if juncus was harvested at the start of fall, it might not have been ready to be processed until people had moved further upland to take advantage of late ripening plant resources such as acorns and pine nuts. Weaving baskets would have taken place after materials had been harvested and processed. This stage, though possible to put down and pick back up again, is time consuming and likely took place in winter months when plant food resources were less abundant and women had more time for other pursuits. This basket production taskscape model incorporates idealized settlement patterns and production stages which can be compared against real world examples to determine the accuracy of the established predictions.

CHAPTER 5: METHODS

Several methodological approaches are needed to evaluate a site's potential as a location of basket production and to determine which stage(s) of production might have occurred in that place. Because in most instances perishable technologies do not preserve well, it is necessary to draw inferences from tangible evidence to indicate if basketry was made or used at a site. The primary approach taken in this research project is to identify tools that could have been used in basket production. This identification is informed and contextualized by ethnographic information. Further, supplemental data from paleobotanical samples and contemporary environmental settings help to round out the interpretation of whether a site was used for basketry production, and if so, what stages of basketry production took place there.

The possibility that a site was used for the initial harvesting stages is evaluated using evidence such as contemporary plant communities, paleobotanical data, and any other relevant material culture, such as knives needed to cut woody plants. The likelihood that a site was used during the processing stage is evaluated by examining artifact assemblages and archaeological features that are known to have been used as part of the materials preparation. Based on the review of basketry plant processing knowledge discussed in the previous chapters, utilized flakes are anticipated to have been used to process coiled basketry weaving strands in the interior Chumash region. Identifying utilized flakes that may have served to cut plant materials or scrape the pith from plants to render them useful can serve as a key indicator of production activities (Tringham et al. 1974). This identification requires many levels of analysis. In order to confidently make inferences about the use of prehistoric tools, an experimental flake tool use

program and usewear analysis was undertaken as part of this project. Replicative studies serve to increase the confidence of interpretation for the compared archaeological materials (Bamforth 2010). This experimental program produced a comparative usewear collection that was used in conjunction with usewear studies conducted by other researchers.

Prior to comparing the archaeological utilized flakes with the replicated utilized flakes, it was necessary to identify utilized flakes in the collections that could be considered for this analysis. Three of the four sites used in this study (Pond, Three Springs, and Cache Cave) had no previous lithic analysis conducted on excavated assemblages. Therefore, it was first necessary to analyze the lithic assemblages from these sites to characterize the other uses of stone at the sites and determine if there were utilized flakes present.

After the experimental replication was completed and the lithic assemblages were analyzed, it was then possible to conduct a microwear analysis of the utilized flakes identified in the archaeological assemblages. Microwear analysis, while insightful, has its limitations. Because of the limitations of the microwear analysis methods I used for this paper, it was also necessary to examine supplemental data from the sites to strengthen the interpretations regarding basketry production. Supplemental data included paleobotanical information where available and identifying and quantifying additional tools and features used in basketry production.

A site's capacity for serving as a storage locale was evaluated based on physical characteristics of the sites, artifact assemblages, and archaeological features, such as structural remains. The final stages of production, such as weaving and water proofing,

was identified at sites based on artifact assemblages which contained evidence of basketry, awls, and tarring pebbles.

In this section, I discuss the methods I used for the general lithic analysis, provide a review of microwear analysis methods, the production of the experimental comparative collection, the archaeological microwear analysis, and the assessment of supplemental data. Also provided is a brief reflection on the utility and shortcomings of the methods along with a clear description of how I employed each method and addressed concerns with methodology.

General Lithic Analysis

All lithic assemblages considered in this study are housed at the Santa Barbara Museum of Natural History (SBMNH). Each assemblage was taken out on loan for several months to allow time to conduct all the analyses, under the guidance of Tacy Kennedy and Dr. John Johnson. In many instances, tools were bagged with debitage or artifacts of different material types were cataloged together. In these cases, the Object ID number, or catalog number, was broken up with the addition of sub numbers in order to analyze the assemblage in the clearest and most complete fashion. If an Object ID number has a period and a number at the end of it, this indicates that these items are cataloged in the same bag but have been recorded separately in this analysis. For example, originally cataloged item CC-14-1547 contains a modified flake and a piece of debitage. In this catalog, the flake tool has an Object ID of CC-14-1547.01 and the debitage has an Object ID of CC-14-1547.02.

Lithic analysis can be defined as the visual assessment and measurement of attributes on flaked stone objects. Lithic analysis can provide information on a range of

topics, including procurement, tool manufacture, assemblage variability, tool use, human behavior, and perspective (Odell 2003: 2-12). Based on information such as artifact type, size, material, and condition, much can be said about the activities that took place at a site specifically, and when looked at on a regional scale, can be used to infer patterns within broader society (Andrefsky 2005). Essential to the study of lithics is the classification of artifacts into like groups. The main purpose of classifying items is to organize and summarize data to facilitate communication and to identify patterns in the data. This is also a way to make comparisons across a site, a region, or across cultures (Andrefsky 2005:61). This process of classification is started by organizing items by similarities or clusters of like attributes, known as types or classes which must be inclusive and systematic enough to be repeatable, made possible using meaningful variable attributes (Andrefsky 2005:62; Odell 2003:87).

The classification system used for this analysis draws from several useful and relevant typologies. Formal tools are generally organized into a morphological typology as described by Andrefsky (2005:74-84). This typology is nuanced by more local chronological and morphological typologies relevant to the region, such as that used by Mikkelsen and colleagues in their work in Cuyama Valley (2014b:4-8). For debitage, Andrefsky (2001, 2005) outlines four distinct typological schema that can be used to classify flakes and shatter: Triple cortex, application load, technological, and free-standing (2005:115-130). The triple cortex typological system was used to classify debitage type for all flakes which could not be assigned to more detailed flake type categories. The application load typology differentiates between hard-hammer percussion, soft-hammer percussion, and pressure flaking (Andrefsky 2005:118). I did

not differentiate between hard or soft hammer types but I did differentiate between percussion and pressure flakes based on known characteristics such as bulb presence and size, platform size, presence or absence of rings of force, and general flake size.

When possible to identify, reduction strategy and reduction stage was noted, as was platform type (Andrefsky 2005; Balme and Patterson 2006; Sutton and Arkush 2009). The technological typology, as Andrefsky describes (2005:120-127), is a popular classification system to accomplish this, and one I relied upon heavily for my own debitage analysis. In this system, sets of attributes or characteristics are consistently identified as being produced by specific types of reduction strategies or tool production strategies. Such flake types commonly include bifacial thinning flakes, alternate flakes, or notching flakes. A critique of this typology comes from Sullivan and Rozen (1985) who note the lack of analysists using consistent definitions for commonly used types such as bifacial thinning flakes. To correct for such issues in my own typological assessment, I maintain detailed descriptions for each flake and tool type which guide classification. My own typology follows selected aspects of many scholars (e.g. Mikkelsen et al. 2014a, 2014b, Whittaker 2010, Wilke 2009, Andrefsky 2005, Balme and Patterson 2006, and Sutton and Arkush 2009). Finally, a free-standing typology, as discussed by Andrefsky (2005:127-130), was used in instances where no cortex, load, or technology typology could be applied. These included flake fragments and shatter.

Provenience data, count, weight, artifact type, material type, and presence or absence of cortex, and usewear were recorded for all formal stone tools and debitage. A 10x hand lens was used to make initial observations regarding usewear. For formal stone tools, additional data was recorded, including dimensions (mm), and further description

of tool type and subtype. These items were also visually examined for evidence of residue. Flake tools were subjected to an even more detailed examination to provide supplementary information for the microwear analysis of these items. Additional attributes recorded for flake tools included number of tool use edges, utilized edge morphology, location of wear, and types of wear (Balme and Patterson 2006; Odell 2003; Tringham et al. 1974). Flakes and flake tools which exhibited possible evidence of usewear were analyzed with an incident light stereo microscope to determine the extent and nature of microwear patterns, as discussed in the Archaeological Microwear Analysis section.

Microwear Analysis

Examining stone tool characteristics to infer use has a deep history in archaeology. In 1872, John Evans was one of the earliest archaeologists to link edge damage on a tool to the task for which it was used (Marreiros et al. 2015; Tringham 1974:171-172). However, contemporary usewear studies in the United States were revitalized in 1964 with the translation of Semenov's work on usewear, "Prehistoric Technology", into English from Russian (Semenov 1964; Evans 2014:1). This work was influential because Semenov removed the vague guesses of early observations by employing systematic experimental testing to link certain usewear patterns to how a tool was used and on what material it was used (Tringham et al. 1974:172). Microwear analysis examines the polish, edge damage, and striations on lithic artifacts, which develop as a result of use. The use of lithics in different activities, such as cutting meat, drilling holes in shell, or scraping plant materials, produces different usewear patterns

which are identifiable through a microscope (Bamforth 2010; Elzinga 2011; Keeley 1980; Shea 1992).

This methodology is the only contemporary means of providing direct evidence for tool use in the archaeological record (Bamforth 2010). A good microwear study must determine the function or multiple functions of artifacts examined with precision (Keeley 1974:323). An instrumental aspect of my research was to identify tools used to make basketry, a difficult task, given the lack of a well-defined and consistent tool kit, as already discussed (Hector 2006). Microwear analyses connect the presence of an artifact at a site to the function of the artifact and thus provides additional information on the types of activities which occurred at a site. In the following section, I will provide a brief discussion of common usewear analysis methods, types of usewear that can be observed, and how usewear is interpreted. This will be followed with a description of the experimental program of this project and the methods used in the analysis of the archaeological artifacts.

Starting in the late 1960s, archaeologists began experimenting with different methods of usewear analysis that have coalesced into two distinct types: low power methods and high power methods. A heated methodological debate ensued over the next few decades about which method produced superior results (Tringham et al. 1974:172-3; Newcomber et al. 1988; Keeley 1974; Odell 1975). Limited use of the methods early on resulted in low confidence in the ability of microwear analysis to make meaningful interpretations, exacerbated by the time-consuming nature of the work and the need for trained professionals to conduct the analysis (Tringham et al. 1974: 174). However, it is now widely agreed that microscopic usewear analysis is a useful tool and the most

accurate usewear analysis should consider both high and low powered techniques when developing an analytical methodology, since each method is well suited to different, yet complimentary tasks (Elzinga 2011: 85; Shae 1992). Nevertheless, standardization of terminology and documentation remains elusive (Evans 2014:1).

The three most common types of usewear used in analysis to identify directionality and material worked include microflaking (also known as edge scarring), abrasion, and polish. Striation is less reliable and, while noted when observed, is not always helpful in identifying use (Odell 1975:229). Defining wear, Odell states "'Edge scarring' is taken here to mean the tiny chips removed from the edge of a stone tool under pressure. 'Abrasion' refers to the smoothing, or wearing down, of corners and projections produced by external forces. Some researchers refer to this phenomenon as 'edge rounding'. And 'polish' is any area exhibiting a lustrous finish" (Odell 1975: 229). Where both methods can identify abrasion, low power is best used for identifying and interpreting microflaking while high power is best used for identifying and interpreting polish.

Low Power Magnification

Low-power microwear analysis consists of looking at the used edges of a lithic artifact with a low magnification device. The definition of low magnification seems to vary among scholars, generally ranging from 10 power magnification (x) to 100x (Bamforth 2010; Elzinga 2011:86; Keeley 1980: 2). This method can be employed with minimal artifact preparation, and using affordable tools such as simple hand lenses and stereoscopic microscopes (Elzinga 2011:86; Keeley 1980:2). This method is best suited to assess directionality of use and the likely hardness of the material on which a tool was

used (Elzinga 2011). Microflaking is best identified and analyzed in low power techniques (Tringham et al. 1974:185-6). Microflake types includes scalar (Tringham et al. 1974), circular (half-moon), semi-circular, triangular, quadrangular, trapezoidal, and irregular (Marreiros et al. 2015:13). At these lower magnifications, it can be difficult to observe polish or striation which develop at much slower rates than the edge damage, sometimes not developing at all or not to the degree where it can be observed (Odell 1975:229; Tringham et al 1974: 175; Keeley 1980). However, larger striations and evidence of polish can be seen at the lower power magnification at times (Keeley 1980). Microflaking size, shape, and distribution along a utilized edge has been analyzed to provide successful interpretations of how a tool was used and on what categories of materials it was used (Tringham et al. 1974; Shae 1992).

While Tringham and colleagues (1974), and Odell (1975) are well known early proponents of low power studies, other more recent studies will sometimes opt to use these low power techniques (Claude et al. 2015; Elzinga 2011; Rotts 2005). Ultimately, this method can be used on a large number of artifacts, quickly, and with minimal equipment. It can successfully identify directionality of use and the relative hardness of the material worked. However, this method does not identify striation or polish as well some high powered methods. This limits the methods usefulness in identifying the type of material worked.

High Power Magnification

Lawrence Keeley introduced high power microwear analysis in 1980, conducted with a high magnification reflected light microscope (Marreiros et al. 2015:9). This method started using magnifications between 100x to 400x to analyze striations, polish

and edge damage to inform tool use (Andrefsky 2005). Similar to low powered methods, this type of analysis has the potential to inform the way in which an object was used and on what type of material it was used (Bamforth 2010; Odell 2003). However, the advantage is that this method has the ability to more narrowly define what types of materials were worked, predominantly based on polish type (Keeley 1980). Striations are predominantly used to infer directionality of tool use for the high powered method, however, this approach has its limitations (Vaughan 1985:24-25). Similar to abrasion in low powered analyses, edge rounding can indicate intensity of use and hardness of material (Vaughan 1985:26). Polish, or the luster developed from sustained contact with a worked material, is the most diagnostic wear observed in high powered analyses and can be used to identify the class of material worked, such as wood, meat, or hide (Odell and Odell-Vereecken 1980:88; Keeley 1980).

Just as Tringham and colleagues (1974) demonstrated that different microflakes appear dependent upon type of task and hardness of material, so too does polish pattern in a way that can inform analysts about the type of activity a tool was used for and on what material it was used (Keeley 1980). The main drawback to this high powered method is the narrow focus of the high magnification for some devices. Additionally, it can be challenging to make the distinctions between types of polish and striation (Marreiros et al. 2015:9). Further, these methods require expensive machinery and often have required a great deal of time commitment (Odell and Odell-Vereecken 1980:89).

Microwear Analysis Technology

Both high and low power analyses make use of optical microscopes. Low power analysis tends to us stereoscopic microscopes (up to 100x to 160x) (Andrefsky 2005:6;

Odell 2003:143) and high power analyses use metallurgical microscopes (50x-400x) (Marreiros et al. 2015:11; Odell 2003:148). Additional high powered techniques include Scanning Electron Microscopes (SEM) (up to 10,000x) (Andrefsky 2005:6) and laser scanning confocal microscopes (25-800x) (Marreiros et al. 2015:11-12).

Microwear Analysis Accuracy

Some studies have undertaken the assessment of both types of methods to determine that these approaches should be used in a complimentary way (Borel et al. 2014; Marreiros et al. 2015; Shae 1987, 1992; Stevens et al. 2010). An important outcome of these studies has been the assessment of the accuracy of each method. Stevens and colleagues (2010) compared the accuracy of high power and lower power methods. They found that blind testing of high power and low power usewear analysis methods display varying degrees of accuracy, dependent upon the level of detail a researcher is looking for. For low powered techniques, an accuracy level of 70-90% is attainable for identifying presence or absence of usewear. However, only 65-70% accuracy was achieved when determining classes of hardness for contact material. The lowest accuracy with the most variation of success, 20-70%, occurs when attempting to identify types of worked material. The authors state that although low powered techniques exhibit limited success in identifying worked material types, they were successful at identifying general hardness categories which can be improved with the inclusion of polish analysis (Stevens et al. 2010:2672). However, no statistics were provided on how much identification of material is improved with the inclusion of polish. In the blind tests by Odell and Odell-Vereecken, it appears that low power analysis identification of relative worked material, or hardness, is accurate around 61.3% to 67.7%

of the time and identification of actual worked material is low, around 39% on average (1980:116). Odell and Odell-Vereecken state that methods for any particular usewear study must be "adapted to the particular situation and questions being asked of the data" (1980:87).

Microwear Analysis Methods Used

For this project, an incident light stereoscopic microscope was used with power between 14x and 135x. Though this device is most suited for use as a low power analytical device, a high magnification lens allowed for the identification of the presence of some larger striations (Keeley 1980:2) and polish or gloss (Elzinga 2011). This device allowed for the expedient analysis of many flakes. Additionally, Odell and Odell-Vereecken asserted that only a limited amount of information is lost by not using time consuming high power methods (1980:89). Future work on this project should incorporate a high power usewear component to identify polishes that may strengthen the interpretation of what type of material was worked by each tool. At this time, knowing directionality and relative hardness is a good basis with which to interpret that plant parts were being processed for perishable technologies. As Miller (2014) asserts, plant-scraping wear is almost always associated with production of goods, not food (Miller 2014: 298). Ultimately, many researchers agree that having access to comparative usewear photographs and developing a good experimental lithic reference collection is a must for a sound microwear analysis (Bamforth 2010; Marreiros et al. 2015:15).

Experimental Methods

Flint Knapping

The experimental replication of stone tool production is termed flint knapping (Whittaker 2010). Experimental flint knapping can inform tool production processes, site interpretation, and provide technology to use in other types of experimental research (Andrefsky 2005; Carr and Bradbury 2010). There are three types of flint knapping experimentation: technological (inferring technological production from debitage), replicative (cognitive, assessing process of tool manufacture) and highly controlled (looking at fracture mechanics, how and why flakes form the way they do) (Carr and Bradbury 2010:75). Detractors assert that flint knapping experiments do not have the controls to avoid issues of equifinality, or the possibility that the end result observed could have been reached by other behavior processes (Carr and Bradbury 2010). Despite potential variability, close attention to detail has provided some very useful results from experimental flint knapping which can be used successfully to interpret the archaeological record (Carr and Bradbury 2010).

I first began learning how to flint knap under the guidance of Dan Reeves at the San Bernardino Applied Archaeological Field School in 2010. Since then, I have continued to develop my skills in flaked stone tool production, taking classes, assisting in training workshops, and teaching students the fundamentals of making stone tools. This training has provided me with a solid understanding of lithic reduction processes, an essential skill for experimental replication and lithic analysis. Incorporating my seven years of flint knapping experience, and drawing from sources such as Tringham and colleagues (1974), Odell and Odell-Vereecken (1980), Bamforth (2010), Jolie and

McBrinn (2010) and Carr and Bradbury (2010), the experimental portion of this project was designed specifically to help identify stone tools that may have been used in basketry production.

Experimental Perishable Technology Production

A major component of this project was the identification of tools used to make baskets. Some basket-making tools, such as tarring pebbles or awls, have distinct morphological characteristics that suggest they were used in basketry production. However, as discussed previously, ethnographic literature from Southern California indicates that modified shell or utilized flakes may have been exploited to prepare juncus for use in weaving coiled basketry. To identify these tools, which are not morphologically diagnostic, the patterns of usewear that develop from basket material preparation must be identified. This objective is best accomplished by experimentally reproducing basketry using traditional techniques. Further, Chumash ethnographic accounts suggest that only *Tivela* clam shell was used to prepare juncus (Hudson and Blackburn 1987) while accounts of Yokuts basketry plant processing from the interior indicate that a lithic flake was used in similar circumstances (Latta 1977:541). Jolie and McBrinn (2010) assert that the ethnographic record does not always account for all the nuances of perishable technology production processes, suggesting that there may have been some flexibility in the Emigdiano people's choice of tool to accomplish processing tasks. As the Emigdiano Chumash region is a crossroads of inland and coastal cultural influence, stone, instead of shell, may have been used in basketry material preparation. The abundance of lithic materials at the interior archaeological sites and the limited presence of marine shell suggest that flake tools are more likely to have been used by

interior populations. Though modified clam shell may have also been used by these populations, this experimental program was undertaken to see if lithics could be identified as tools used in this process.

To test whether utilized flakes could be used in making baskets and to produce comparative usewear of basket material processing tools, I undertook the task of making a coiled basket from the start, using flakes in the place of clam shell. This task was undertaken using juncus as the main weaving material because it is such a common basketry material used by the Chumash, the production processes is well documented, and it requires a set of processing stages that have the potential to produce diagnostic usewear.

While the physical process of making a basket begins with harvesting the material, one must first be introduced to the knowledge of where to find good quality plants and best practices for retrieving them. Danial McCarthy, an archaeologist with decades of experience working with California tribes to expand our knowledge of cultural resources and traditional cultural practices, was kind enough to take me to a juncus gathering location in the San Jacinto Mountains. We visited the patch of juncus in mid-February 2015 and collected approximately 90 chutes ranging from 3 to 5 feet in length and approximately 3 mm thick (Figure 5-1 and 5-2).

Figure 5-1. Harvesting juncus (note that the plant is grabbed close to the base and pulled up; Daniel McCarthy in photograph)

Figure 5-2. Bundle of fresh picked juncus (note the rust colored base, prized color for decorating baskets; Daniel McCarthy in photograph)

Once harvested, the plants were left to dry indoors, near a window with ample light. After a week, a selection juncus stalks was used for some initial processing

experiments. The purpose of this first phase of experimenting was to determine if usewear developed from cutting and scraping juncus and to get a feel for the different stages of juncus processing. First the ends were cut off the dried juncus (Figure 5-3). Both the tips and the red bases were removed to produce chutes that were of approximately equal length and even thickness. Cutting with an unmodified flake was very difficult due to the hardened exterior of the juncus.

Figure 5-3. Cutting the red bases off juncus using an unmodified flake

Following cutting, the juncus stalks were split into two strands following the description provided by Hudson and Blackburn (1987:217-218). The juncus was split in two, due to the small diameter of the chutes. To start the split, one cut end was divided by using a fingernail, extending no more than an inch into the strand. Then a pencil, used in place of an awl, was used to separate the two strands, one of which was held in the mouth and the other of which was held with the left hand which also guided the split (Figure 5-4).

Figure 5-4. Splitting juncus strands

Much of the juncus that was harvested was twisted so that the grooves or ridges of the exterior that run lengthwise along the plant stalk were not straight from top to bottom but rather spiraled around the exterior. Because of the twisted nature, the juncus was cracked open first, by placing both hands on the plant as if holding a handlebar and twisting each hand away from each other in a slight jerking motion. This was done for the entire length of the juncus and created a single seam that was followed when the juncus was split with the pencil and hands.

Once the juncus was split it was necessary to scrape the interior of the juncus to remove the spongy or papery pith. Small Temblor chert flakes were used for the initial experiment. The strands were scraped in multiple ways, such as pulling the flake towards the body to remove the pith, holding the flake still and sliding the strand underneath the edge, and pushing the flake along the interior of the strand starting close to the body and moving away (Figure 5-5).

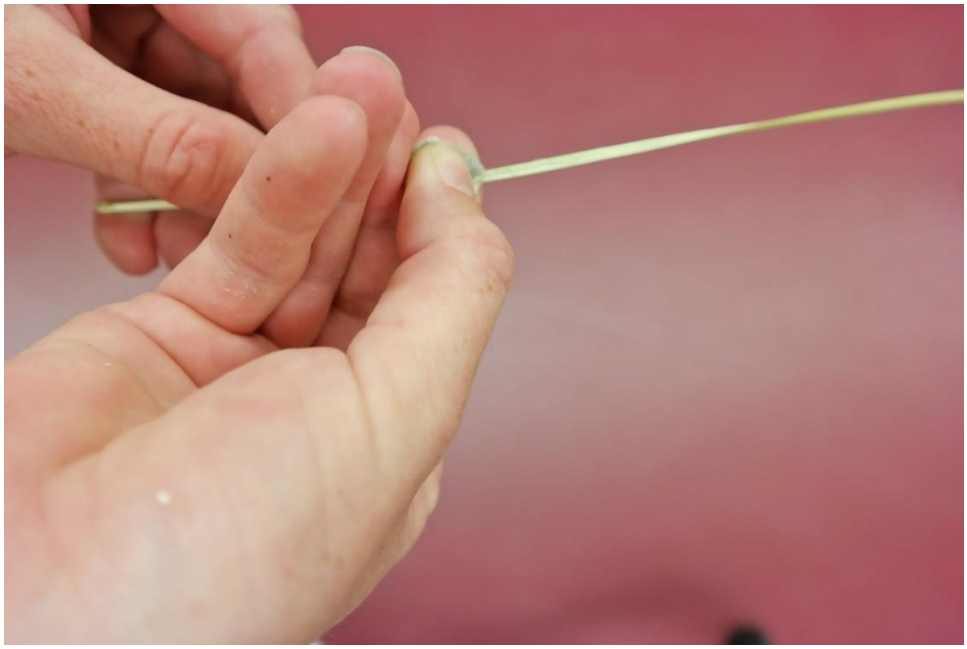

Figure 5-5. Scraping the pith out of the interior side of a strand of split juncus using a Temblor chert flake

Once the juncus was split and scraped it was ready for use in weaving (Figure 5-6). Additional steps for dying the juncus were not attempted as part of this project. Using the juncus that I harvested and processed, along with some yucca and deer grass that I also harvested and processed, I started a coiled basket following the instructions in Justin Farmers "Creating an Indian Style Coiled Basket" (2012). I used yucca fibers for the basket start and added shredded juncus for the early foundation. Once the basket had been coiled a few times it was possible to start using deer grass in the foundation. The juncus strands I processed to weave the coils were not evenly sized and were often short, due to the imperfections in the plants I harvested and the fact that I am a complete novice. The process of making a basket from harvesting the plants to the weaving the processed materials together provided me with an appreciation for the knowledge and skill that weavers poses and also, a better understanding of the practical importance and value of each step in the tradition of basket making.

Figure 5-6. Basket start with shredded yucca start, deer grass and split juncus foundation, and split juncus weaving material

Comparative Usewear Experiments

Utilized flakes are not morphologically diagnostic and thus their use in basketry cannot be inferred without conducting a usewear analysis. Just as the review of usewear methodology indicates above, it is necessary to have a comparative collection to make informed interpretations regarding the wear observed on archaeological specimens (Marreiros et al 2015:15). Tringham and colleagues (1974) state that one of the most important aspects of a good microwear analysis is a "program for rigorous, systematic, large-scale testing of the formation of edge-damage on stone tools as the results of their usage" (1974:174). While images presented in previous studies can be useful to guide interpretations, they do not provide the detail that conducting project specific experimental replication does.

The purpose of this experimental project was to create a controlled comparative microwear collection of utilized flakes made from materials similar to those that would have been used by the Emigdiano Chumash. The types of materials selected to be processed and the ways chosen to process them were informed by current knowledge of traditional Native California lifeways. For this project, worked material types include hide, meat, bone, wood (Crabtree and Davis 1968:426; Odell 2003:188; Tuohy 1982:86-88; Wylie 1974), juncus (Farmer 2010; Timbrook 2007; Hudson and Blackburn 1987), and yucca (Elzinga 2011; Lightfoot and Parrish 2009; Daniel McCarthy, personal communication 2015; Farmer 2010). Each of these material types was processed in a way that involved cutting tasks and scraping tasks, two of the most common uses of flake tools (Tringham 1974; Miller 2014). The purpose of the cutting and scraping varied by processed material type, contingent upon how they would have been used by people in the past. For a more complete description of processing by material type, see Hill et al. (2015).

To account for variability in usewear accrual and patterning, tasks completed on each processed material were done with two different lithic material types: Monterey Chert and Browns Bench Ignimbrite. These materials were selected for two reasons: 1) chert is a common material found in the California archaeological record 2) ignimbrite is a type of volcanic rock which can take the form of a dark volcanic glass with an appearance similar to obsidian or fused shale. It was selected to provide a comparable example for obsidian and fused shale, which are common in Southern California. The flakes used in the experiments were removed from rounded nodules through multiplatform core reduction, with the intention of producing flakes with edges that can

be used to conduct scraping and cutting tasks on the various processed materials in our experiment. In each case of processing, flake use was focused on successful completion of a task rather than the accrual of consistent usewear. This was done to best represent what we might expect to see in the archaeological record (Bamforth 2010).

Experimental replication of different types of worked materials with different types of stone in multiple ways requires a significant time and labor investment. The experimental replication program I designed was conducted with help from several California State University, Northridge Department of Anthropology graduate students as part of a group project for a lithic analysis class. Each participant was responsible for processing one worked material type with the two different lithic materials and documenting the work with sketches, notes, and micrographs. The time and effort of my fellow graduate students is greatly appreciated.

Analysis and Documentation Methods

Materials used for the analysis of experimentally produced usewear included raw stone and organic materials for processing as discussed above, paper, a camera, a MEIJI Techno EMZ-2TR incident light stereo microscope, and the Ken-A-Vision Applied Vision camera and software. The Ken-A-Vision was used to take digital micrographs of usewear. The microscope was used at magnifications between 14 to 135 power; strength of the magnification varied depending on need for analysis. Like most utilitarian tools, utilized flakes experience different life histories and each flake is discarded at a different stage of use depending on material type, flake size, intention of use, tool user's needs, and any other number of factors (Elzinga 2011). To make a thorough comparative collection it is important to take variability of tool life history into account. To best

capture the variation expected in real utilized flake assemblages, experimental replicas were analyzed and documented at three different stages of use: prior to use, after 100 uses, and after 300 uses (Tringham 1974:184).

Flakes were documented prior to use to provide a base line with which to compare the progress of the experiment. Prior to use, flakes were traced onto plain paper to document their initial morphology. This sketch was also used as a reference for illustrating where usewear occurred on the flake as the experiments progressed. Then micrographs of each unutilized flake were taken to document what the items looked like before use. Following this, each flake was used for 100 strokes, either for cutting or for scraping, on each worked material type. At this point, each utilized flake was analyzed and the observations were documented. Using the microscope, locations of usewear were identified, wear was plotted on the sketches, and the extent and morphology of the usewear was noted. Micrographs were taken to document the observed usewear. A final round of use for each flake resulted in a cumulative total of 300 strokes per flake. Following the same procedure, flakes were documented with micrographs and quantitative and qualitative descriptions. In addition to documentation through notes and micrographs, a database was compiled that contains the details of the experimentation process as well as the results of analysis for each flake.

In 2015, I undertook a preliminary experimental usewear production and archaeological analysis, which I presented at the Society for American Archaeology Annual Meeting in 2015 (Hill 2015). The purpose was to gain a better understanding of which methods would be most useful for the larger study and to test if it was possible to identify diagnostic usewear from processing juncus. The lithics excavated from Cache

Cave in 2012 and 2014 were analyzed based on these initial experimental procedures. This process was similar in many ways to the methods described below, with some key differences in this earlier phase of experimentation. Though utilized artifacts were analyzed at different stages of use and notes were taken in between, no tracings were used to note specifically where the use developed on the margin or where the micrographs were taken. This proved challenging when it came time to use the comparative data. Additionally, only juncus cutting and scraping was incorporated in this early study. The current study incorporated a much wider array of worked materials, making the comparative collection more robust.

Although much effort was put into creating a thorough comparative collection, no blind tests were conducted to assess the utility of the comparative assemblage in providing evidence of diagnostic usewear. Many microwear analysts attest to the importance of blind tests and future work in this area should incorporate this into the research design (Odell and Odell-Verkeecken 1980; Stevens et al. 2010). Additionally, many experimental replication usewear studies on other tool types set time limits or stroke limits on experiments, some consistent and some variable (Claud et al. 2015; Elzinga 2011; Tringham et al. 1974). The limit of 300 strokes per flake was chosen because utilized unmodified flakes tend to dull more quickly than modified flakes or other formal tools and it was though that utilized flakes were likely expedient tools that were not used for long periods of time. Additional experiments with longer use times and greater stroke counts would benefit this experimental regime.

Archaeological Microwear Analysis

The microwear analysis of the archaeological assemblages occurred in three phases. As discussed in the General Lithic Analysis section, potential utilized flakes were initially identified using a 10x hand lens in the course of analyzing the entire assemblage for Three Springs, Pond, and Cache Cave. Because Tashlipun had been previously analyzed, flake tools were identified in a slightly different manner. That assemblage was examined at SBMNH and only cataloged bags with flakes large enough to likely exhibit usewear were taken out on loan for further analysis. These cataloged items were then examined using a 10x hand lens for traces of wear.

Once the utilized flakes or potentially utilized flakes were identified, I created a flake analysis sheet similar to the ones used in the experimental microwear analysis. The catalog number, material, and flake type was noted at the top. The flake was traced with the ventral face up on one half of the paper and the dorsal face up on the other half of the paper. This sheet was used for documenting the location and type of use, notes about observations, and locations of micrographs taken. Though the entire surface of each flake was examined, micrographs were only taken of representative sections of the tools. The utilized flakes were examined under the same MEIJI Techno EMZ-2TR incident light stereo microscope and photographed with the same Ken-A-Vision Applied Vision camera and software used in the experimental program. Like the experimental analysis, the strength of the magnification used for analysis and micrographs varied depending on need for analysis.

After the initial documentation, utilized flake use was assigned by carefully reviewing the micrographs, sketches, and notes and comparing them with data generated

from the experimental program in this study and information from previous studies. Attributes documented for utilized flakes were determined based on methods noted by Tringham and colleagues (1974), Odell and Odell-Vereecken (1980), and others, and include number of utilized edges, utilized edge morphology, presence or absence of polish, gloss, striations, abrasion, and microflakes, distribution of usewear, and microflake types present. The interpretation of use included task, such as cutting, scraping, or boring; the relative type of material worked, hard, medium hard, medium, medium soft, and soft; and an interpretation of possible worked material such as bone, wood, soft plant, or hide.

While the identification of utilized flakes potentially used to process plants for weaving baskets is an important element of this study, the emphasis on low powered techniques leaves some ambiguity in the interpretation (Keeley 1980; Odell and Odell-Vereecken 1980; Stevens et al. 2010). Because of this, the results of the utilized flake analysis cannot be relied upon alone to make interpretations of site use for basket production. Further, these flake tools only account for a single stage of basket production, namely the processing of plants that have already been harvested but which are not yet ready to be used in weaving. The following section provides a discussion of what other types of archaeological evidence can be used for identifying stages of production and how this data was recovered.

Additional Basketry Production Evidence Analysis

As discussed in Chapter 3, a number of researchers have attempted to use tangible evidence to identify basket production locations. Here I discuss which of those methods I incorporated into this study and how they were employed.

Artifactual Evidence

In her discussion of features and tools used in processing basketry material, Hector (2006) asserts that a few tools are required in the production of baskets. These include awls, stone knives, scrapers, sizers (used to trim weaving strands to desired widths and thicknesses), pulpers or pounders (used on agave and yucca to remove pulp), and pebbles (used to rub seed off stalks of deer grass and to tar baskets) (Hector 2006:107-8). Another necessary aspect of basketry production is water, used to moisten the weaving strands, making them pliable enough to bend without breaking (Timbrook 2008). This water could be used in situ, from a spring or stream, but was more likely used at a site in some sort of storage container such a basket or bowl (Hector 2006:108). Awls and tarring pebbles specifically, and bowls supplementally, could suggest that late-stage basket production occurred on site.

Features to consider in the identification of fiber or basketry production include milling rubs and sand pits for roasting leaves for pulp removal, both associated with processing yucca or agave. Hector also notes that "bleaching or dyeing areas potentially present as pits or depressions only" could potentially be observed archaeologically (Hector 2006:108). Because the Chumash used juncus more often than yucca in basketry production, it is less likely that milling rubs would be identified in the region. To dye juncus fibers, materials would be run through warmed ashes from an old fire or be buried in dark mud with a high organic content (Hudson and Blackburn 1987). Though it may not be possible to identify places where strands were buried, the warmed ash pits may be identified by the presence of an ash lens or charred and preserved macrobotanical

remains. This supplemental data was gathered from excavation reports and artifact catalogs generated from the various field efforts at each of the sites.

Environmental and Paleobotanical Evidence

Following Anderson's (1999:81) discussion of basketry plant management systems, each site was examined to determine the presence or absence of plants known to be used for basketry. Anderson notes that historical changes have likely occurred to vegetation distributions due to ranching and farming, however, if these native plant communities still exist near a site it is a good indication that they could have been harvested at these locales. Plants considered include juncus, sumac, willow, and deer grass. Though the region has been impacted by ranching, the Wind Wolves Preserve has rehabilitated the area to allow native species to thrive. Therefore, it is anticipated that the presence of any native plants located at the site today could have grown at the site in the past. This information is taken into consideration when identifying locations as potential harvesting locales.

Additionally, each site has been subjected to some level of paleobotanical analysis, with Cache Cave analysis still in progress. The presence or absence of basketry plant remnants can be used to infer if people at any given site were using basketry plants. Additionally, the presence of seeds can be used to determine when a site may have been occupied seasonally (Gill 2012:). As discussed in Chapter 4, this site use seasonality can be used to infer the likelihood that people would have been at a site at the times that basketry plants were available for harvesting. If site use in the seasonal round overlaps with when basketry plants would have been tended or harvested, even if there is no paleobotanical evidence for the basketry plants themselves, this increases the likelihood

that the site could have been a place of harvesting. Harvesting locations were tended carefully, depending upon the material growing there, and would have been reused for many generations (Hector 2006:105).

Finally, the presence of prepared plant materials may also indicate that a location was used in some stage of basket production. Hector notes a weaver's kit was discovered in Death Valley which contained bundles of prepared devils claw and willow shoots, a handless porcelain cup, a cake of white chalk, and a chunk of rock salt (Hector 2006:108). No tools of prehistoric production were observed but it is possible the cup was used for production somehow. This cache was a location of plant material storage, one of the stages in basket production.

Summary

Lithic analysis, experimental replication, microwear analysis, and artifact and feature identification are all important aspects of the methodological approaches in this project. The experimental replication, lithic analysis and microwear analysis take up a disproportionate amount of work in this thesis because these steps had not been previously undertaken. Unlike the paleobotanical analysis or the identification of additional artifacts or features, no lithic analysis had been conducted on three of the sites and no usewear analysis had been conducted on any of the sites. Thus, the methodological approach in this project needed to address these aspects to evaluate each of the sites potential for basket production. Having reviewed the methodological approaches taken in this thesis, the following chapter presents information about the sites incorporated in this study: *Tashilpun* (CA-KER-188H), Pond (CA-KER-1635), Three Springs (CA-KER-3388), and Cache Cave (CA-KER- 10419).

CHAPTER 6: ARCHAEOLOGICAL DATA SETS

The goal of modeling the organization of basket production in hunter-gatherer society and identifying production locales in the archaeological record is pursued as a case study in the Emigdiano Chumash region of Southern California. In this case study, four sites representing three different site types are analyzed: the village of *Tashlipun*, two milling camps or k-locales, and an upland cache cave. With only three site types analyzed, it is possible that a suite of sites related to basketry production are not examined in this study. However, these sites were intentionally selected for several reasons. First, these sites are places where people are known to have spent time in many different pursuits that are distinct from each other. Additionally, the sites are places that were likely used at different times of the year. Finally, each of the sites was previously excavated, providing an abundant and diverse set of archaeological assemblages to work with.

This chapter provides site descriptions for *Tashlipun*, Pond, Three Springs, and Cache Cave, including the physical setting, excavation methods, and a general discussion of the cultural assemblage recovered from each site. More specific information is presented for assemblages which provide evidence for basketry production, such as paleobotanical and lithic collections. In order to conduct the microwear analysis for this thesis, the lithic assemblages of Three Springs, Pond, and Cache Cave needed to be fully analyzed. The details of this general lithic analysis, while important, is supplemental to this project. Because of this, only a brief summary of the lithic assemblage at each site is provided. Analyses of these assemblages are ongoing and will be presented in later work.

***Tashlipun* (CA-KER-188H)**

CA-KER-188H, the largest and most densely occupied site identified in the canyon, was used by the Chumash in prehistoric and historic times, as well as by European descendants during the Mexican and American periods (Bernard 2008; Sheir 2011). The site is located on the western bank of the San Emigdio creek in an open area known as Dominguez Flats, close to the northern aperture of the canyon. This site extends approximately 120 meters N/S by about 120 meters E/W (Figure 6-1). The location is known today to be the historically documented village of *Tashlipun*, determined through the field and research efforts of Dr. Julienne Bernard as part of her dissertation (Bernard 2008). Later in time, this site served as the headquarters of the Rancho San Emigdio starting in 1842, and changed hands several times through the American Period (Bernard 2008:86; Sheir 2011).

This site was first excavated in 2004 under the direction of Rebecca Orfilia who was interested in the historical archaeological assemblage (Bernard 2008:86). Bernard conducted excavations focused on the Native American occupation of the site in 2005 and 2006. In 2005, three 1x1 meter (m) units were excavated up to a meter below surface and exhibited an upper and lower cultural stratum (Bernard 2008:117). Excavations in 2006 focused on the upper cultural layer and consisted of nine 1x1m units that generally extend between 0-40 cm below surface (Bernard 2008:119). Bernard conducted the analysis or submitted for analysis all artifacts recovered from the site during the 2005 and 2006 excavations. Materials excavated in 2005 and 2006 were reviewed for the current project; any prehistoric artifacts recovered by Orfilia in 2004 were not analyzed as part of this study.

The site was occupied from at least as early as AD 1167-1278 based on AMS dates, up to the mission period in 1818 when a number of *Tashlipun* residents entered into the mission system (Bernard 2008). *Tashlipun* exhibits a large midden, three mounds, and a bedrock mortar feature. The midden exhibits freshwater shell and faunal remains, lithic flakes and tools, stone and shell beads, minimal groundstone artifacts, and charcoal. In her analysis, Bernard found that there was evidence of intensified trade interaction through time (2008:235) and a shift in diet from a largely lacustrine subsistence strategy with little evidence of intensive plant processing and a limited amounts of small mammals in the earliest occupation of the site, to an increased and more diverse presence of meat in the diet with less fish and a more intensive use of small grass seeds (2008:305).

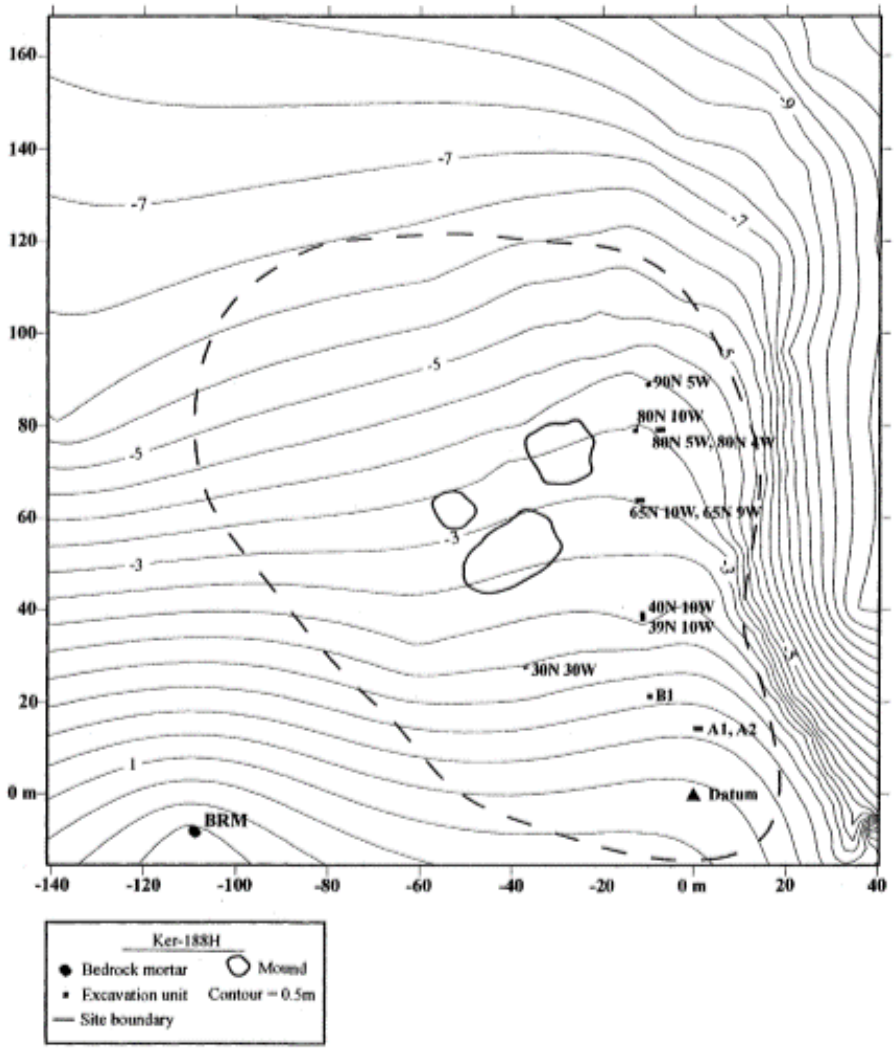

Figure 6-1: Site Map of Tashlipun (CA-KER-188H) (Bernard 2008)

Tashlipun Paleobotanical Data

Bernard collected macrobotanical data from charred plant screen residue and 2 to 4 liter paleobotanical samples taken from most levels of the excavation. Light fraction remains from 11 samples were analyzed by Virginia Popper at the UCLA Paleoethnobotanical Laboratory. All uncharred plant remains were determined to be modern and all charred plant remains were determined to be cultural, based on

comparison with a sample taken from a nearby area that did not appear to exhibit human occupation (Bernard 2008:241-2).

People living at the village used a wide variety of plants from several habitats such as wetlands, grasslands, pinyon-juniper woodlands, riparian oak woodlands, and conifer forests (Bernard 2008:242). The Lower cultural stratum exhibited 29 taxa of seeds and the upper cultural stratum exhibited 24 distinct taxa (Bernard 2008:248-9). Common plant taxa identified from seeds included bulrush or tule, goosefoot or pigweed, grass family, mallow family, miners lettuce, mustard family, poppy, saltbush, and sunflower family (Bernard 2008:249). The most prominent and ubiquitous type are large and small grass seeds (Bernard 2008:252) Common woods identified at the site include saltbush, oak, poplar/willow, and conifer (Bernard 2008:521).

Tashlipun Lithic Data

The Tashlipun lithic assemblage is comprised of approximately 18,000 flaked stone artifacts. As is the case for all sites examined in this project, chert accounts for approximately 98% of all lithic materials, with Temblor chert being the most abundant. The remainder of the assemblage is comprised other chert types such as Monterey and Franciscan, and to a lesser degree, fine grained igneous, fused shale, obsidian, quartzite, quartz and other metamorphic and volcanic materials (Bernard 2008:194) (Table 6-1).

Table 6-1: Tashlipun Lithic Artifact Distribution by Material Type

Artifact Type	Chert	Fine Grained Igneous	Fused Shale	Igneous	Obsidian	Other	Total
Biface	55	2	--	--	1	--	58
Projectile Point	45	1	1	1	3	--	51
Modified Slats	32	--	--	--	--	--	32
Unmodified Slats	69	--	--	--	--	--	69
Cobble Tool	--	--	--	--	--	--	--
Core/ Core Tool	4	1	1	--	--	--	6
Modified Flake Tool	--	--	--	--	--	--	--
Utilized Flake Tool	9	--	3	--	--	1	13
Flake/spall	17837	101	87	1	32	17	18075
Shatter	239	1	--	--	2	1	243
Thermal Spall	--	--	--	--	--	--	--
Total	18290	106	92	2	38	19	18547

Approximately 95 tools were identified in the lower cultural stratum and 45 tools were recovered from the upper cultural stratum. However, Bernard found that when standardized against charcoal, there was an increase in the intensity of tool deposition in the upper cultural stratum (2008:211). There appears to have been a large amount of biface production at the site, mainly using chert materials. Fine-grained igneous and

fused shale were the second most abundant materials, but were present far less than chert. In addition to biface technology, modified Temblor chert slats, cobble tools, and utilized flakes were also present.

Pond (CA-KER-1635)

Pond (CA-KER-1635) was excavated in 2008 by David Robinson, Fraser Sturt, Julienne Bernard and others as part of the regionally focused Enculturing Environments project (Robinson et al. 2008). Pond is a pictograph K-locale, a multi-component site which contains numerous bedrock milling features and a dense midden deposit associated with painted rock art, or pictographs (Robinson et al. 2008:7-9). The K-locale is actually comprised of four individual sites which were previously recorded: CA-KER-1635, -1636, -1637, and -1684. Site CA-KER-1684 consists of single milling feature. CA-KER-1635 and -1636 contain midden soil, 25 milling features with up to 100 mortars, and several rock art locations including five pictographs and dozens of cupules. CA-KER-1637 is a nearby rock art site with four panels. All the pictographs at this complex consists of weathered and fragmented linear red elements. The 2008 excavation was limited to CA-KER-1635, which exhibited the greatest concentration of cultural material. This site is located on a gentle southwest sloping hillside which terminates in a small, round valley with a seasonal sag pond (Robinson et al. 2008:23) (Figure 6-2). The 16 milling features at this locale are on large, linear sandstone outcroppings. Robinson et al. (2008) suggest that this location was a prominent food processing site, located only 4.5 km from *Tashlipun* (2008:8). This site contains *tinajas,* or natural basins carved out of the sandstone outcrops, which hold rainwater (Robinson et al. 2008:8). In addition, there are multiple rock shelters of varying sizes at CA-KER-1635 and the other sites considred in

the Pond complex (Robinson et al. 2008:8-9). A southeast to northwest trending road bisects the midden deposit at the north end of the site.

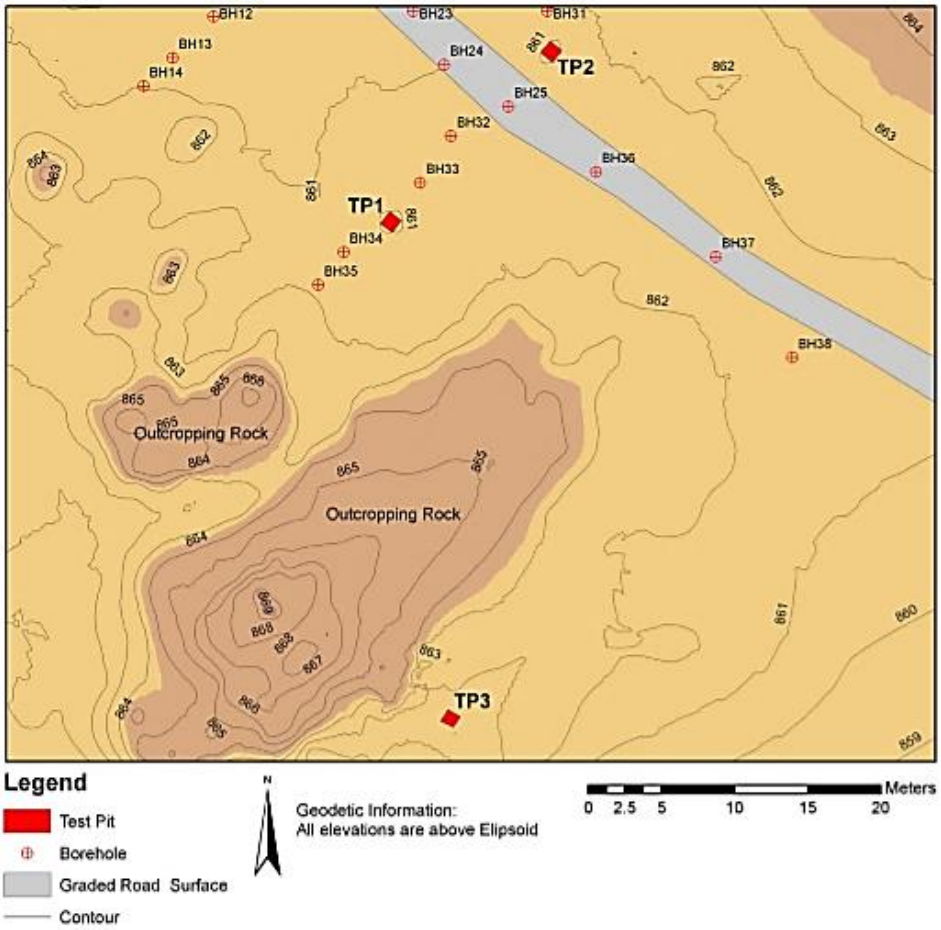

Figure 6-2. Site Map of Pond (CA-KER-1635) (Robinson et al. 2008:7)

Three test pits (TP) and over 40 boreholes were placed across the site to determine the subsurface extent and character of the locality. TP 1 is a 1x1m unit that was placed in the midden deposit north of the large milling features and south of the road. Excavated to a depth of 140 cm below surface, no features were observed in the unit which was heavily bioturbated. However, many lithics, bone, shell, and charcoal were recovered, along with ochre, fire affected rock, groundstone, and tarring pebbles (Robinson et al. 2008). Located near the concentration of milling features, a rock art

panel, and a flat open space with lots of room for activities, TP 1 exhibited the densest artifact concentrations. TP 2 is also a 1x1 m unit excavated to 140 cm in depth. This unit was placed near the roadcut on the northern side, to investigate how the road may have impacted the site. Material culture from this unit was minimal compared to nearby TP 1. TP 3 is a 1x1 meter unit excavated to 50 cm below surface. No features were observed and an increased amount of historic materials were present in the soil.

One olivella wall disc shell bead returned an AMS date calibrated to AD 1060-1221 and other temporally diagnostic artifacts place the occupation of the site from the end of the Middle period into the Late period (David Robinson, personal communication 2016). The lack of year-round water sources, no evidence for house features, the presence of extensive midden with dark soil containing bone and fresh water *Anodonta* shell, a wide variety of artifact types including, lithic tools and flakes, manos, and pestles, suggests this site was most likely a seasonal camp. The presence of a stone bowl, metate fragments, and an increase of *Anodonta* shell in lower levels suggest that the site may have been used more intensively in the earliest part of its occupation (Robinson et al. 2008: 22).

Pond Paleobotanical Data

Paleobotanical analysis was conducted by Kristina Gill in 2012 on 6 samples from a column sample taken from TP 1 (Gill 2012a). Similar to Tashlipun, only the charred materials were incorporated in the analysis because non-charred materials could not be directly associated with cultural activity. Common taxa recovered from the samples include wild cucumber, juniper, oak, and seeds from the grass family, sunflower family, fire poppy, and Indian rush (Gill 2012:7). A little over 99% of the plant materials

recovered from the site were charred seeds (Gill 2012a:10). Grasslands were predominantly exploited, along with wetland habitats, with only minimal evidence of woodland exploitation (Gill 2012a:10). Gill also provided an assessment of plant availability seasonality which suggests the site may have been predominantly used in the spring and summer when a majority of the plant taxa used at the site would have been available. However, Gill cautions that the sample is small and the results of the analysis should be interpreted with caution.

Pond Lithic Data

The Pond lithic assemblage is comprised of 1,354 flaked stone artifacts. The lithic assemblage is dominated by Temblor chert in both debitage and formal tools, followed closely by unidentified chert materials. The remainder of the assemblage is comprised of obsidian, quartzite and Monterey chert, and to a lesser degree, Franciscan chert, fused shale, chalcedony, jasper, quartz, basalt, andesite, rhyolite, and materials that could not be distinguished (Table 6-2).

Table 6-2. Pond Lithic Artifact Distribution by Material Type

Artifact Type	Basalt	Franciscan Chert	Fused Shale	Monterey Chert	Obsidian	Temblor Chert	Unidentified Chert	Other	Total
Biface	--	--	1	3	2	6	1	--	13
Projectile Point	--	--	--	--	--	3	1	--	4
Modified Slats	--	--	--	--	--	2	--	--	2
Unmodified Slats	--	--	--	--	--	--	--	--	0
Cobble Tool	--	--	--	--	--	--	--	3	3
Core/ Core Tool	--	--	--	--	--	--	--	2	2
Modified Flake Tool	--	--	--	--	--	2	1	1	4
Utilized Flake Tool	--	--	--	2	--	1	6	2	11
Flake	20	13	9	35	120	611	155	148	1111
Shatter	--	4	1	10	7	69	50	14	155
Thermal Spall	--	1	--	--	--	39	7	2	49
Total	20	18	11	50	129	733	221	172	1354

A total of 39 stone tools were identified in the lithic assemblage from Pond, including four projectile points, thirteen biface and biface fragments, two cobble tools, one core, sixteen flake tools, and two modified slats. Analysis of the debitage indicates that a the cherts, fused shale, and the obsidian were associated with biface production and use. Quartzite appears to have been the primary material for cobble tool production.

Three Springs (CA-KER-3388)

Three Springs was excavated by David Robinson, Fraser Sturt, Julienne Bernard and others as part of the Enculturing Environments project in 2008 (Robinson et al. 2008). Like Pond, Three Springs is a pictograph K-locale, a multi-component habitation site which contains numerous bedrock milling features and a dense midden deposit

associated with painted rock art, or pictographs (Robinson et al 2008:4) (Figure 6-3). The site is located approximately 4 km east/northeast from Pond and nearly 6 km southeast from *Tashlipun*. Located on a high terrace above Pleito Creek, the site is near a wetland area consisting of a flowing stream and, as its name suggests, three springs. The site contains five milling stations with a total of 36 bedrocks mortars and midden deposits that contain stone tools and lithic debitage, burned faunal bone and shell (Robinson et al. 2008:23). Also identified at the site are two circular depressions, which may indicate house floors that have yet to be investigated, as well as a yet unidentified rectangular stone enclosure. The rock art component of the site consists of two shallow rock shelters which both exhibit pictographs. One pictograph, located on the largest bedrock milling station with 20 mortars consists of a circular element made of red pigment. The other pictograph, which contains two panels with anthroporphs, zoomorphs, zigzags, elaborated bird figures, aquatic elements, radial bursts and a pinwheel element, is in a small shelter which can fit one to two people (Robinson et al. 2008:25).

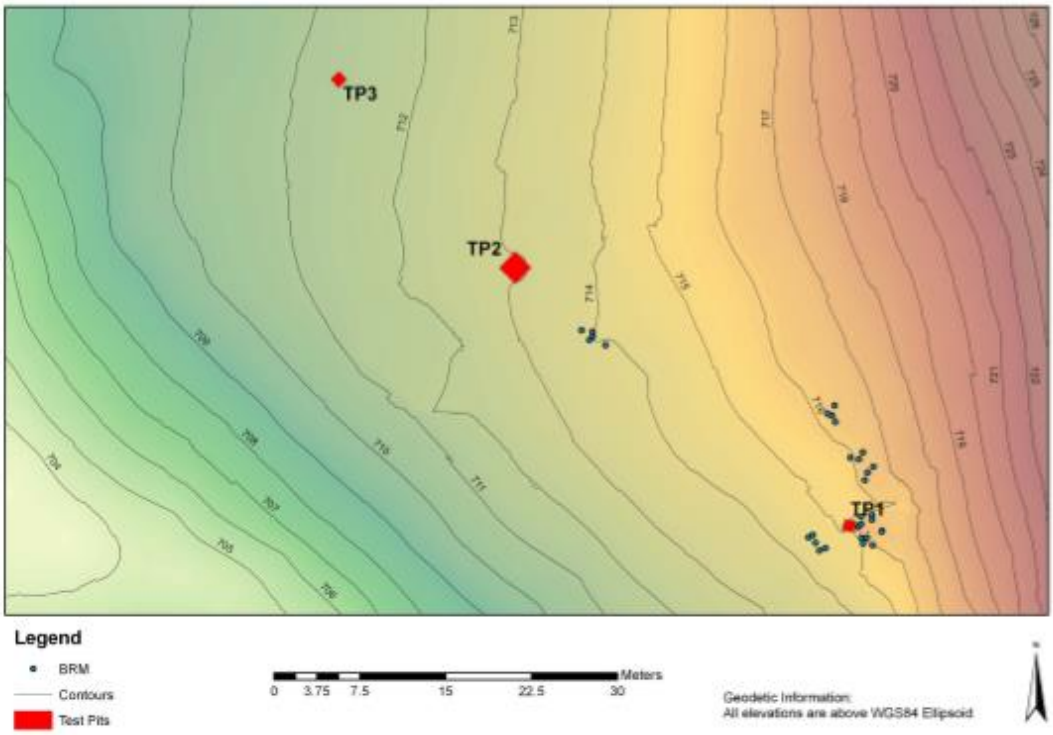

Figure 6-3. Site Map of Three Springs (CA-KER-3388) (Robinson et al. 2008:25)

Four test pits and over 40 boreholes were placed across the site to determine the subsurface extent and character of the locality. TP 1 is a 1x1m unit located in the milling feature concentration, in front of the milling feature with the pictograph. This unit was excavated down to 180cm below ground surface, however the soil was heavily bioturbated and no features were identified. TP 2 is a 2x2m unit from 0 to 50 cm below ground surface, at which point, from 50 to 200 cm below ground surface it was excavated as a 1x1m unit. This unit was placed on the terrace where it overlooks the associated wetlands, away from the BRM features, chosen based on a high concentration of artifacts recovered from auguring. One possible rock ring feature was identified between 160 cm and 180 cm below surface, however, the presence of fire altered rock was sparse and the soil was heavily bioturbated (Robinson et al. 2008:34). TP 3 is a 1x1m unit excavated to 120 cm below surface. This test pit was placed the furthest east in an area that had a

distinct vegetation coverage and where augers revealed A*nodonta* shell and other items. One possible rock ring feature was identified 70-80cm below surface. TP 4 is a 1x1m unit excavated to 60 cm below ground surface. This unit was placed in the southern portion of a rock enclosure found far away from the heart of the site. TP 2 and TP3 exhibited the densest artifact concentrations. These units were located in the wide flat of the site, suggesting this area was likely a primary space for many activities beyond processing resources in the BRMs (Robinson et al. 2008).

Based on the result of excavations at the site, Robinson and colleagues suggest that Three Springs was an important habitation site with the potential to be occupied by several families at one time (Robinson et al. 2008:24-44). Artifacts attest to plant processing and animal butchering among other activities (Robinson et al. 2008:24). More recent network and artifact analysis of the site in regional context has led Robinson to believe Three Springs may have been a village location for some of the earliest settlers in the region (Robinson and Wienhold 2016). This site is similar to Pond in many ways, though there is a higher presence of *Anodonta* shell and ochre in the assemblage (Robinson et al. 2008:44). There are many dates for the site, taken from bone and shell as well as from temporally diagnostic projectile points and beads. Generally, the site has evidence of Early period occupation as well as some Middle and Late period dates. A deer jawbone produced a date of 3711-3636 BC, representing the earliest evidence occupation so far recovered from a Chumash pictograph site in the interior (David Robinson, personal communication 2016). Additional dates from temporally diagnostic artifacts, bone, and shell retrieved from the site indicate there is also evidence of a later

occupation during the Transitional period up to the Late and the Historic period (Robinson et al. 2008:46).

Three Springs Paleobotanical Data

Paleobotanical analysis for Three Springs was conducted by Kristina Gill in 2012 (2012b). This analysis examined various depths from two column samples. A total of 10 samples from TP 1 were analyzed and 8 samples were analyzed from TP 2 (Gill 2012b). Like *Tashlipun* and Pond, charred materials alone were evaluated. Seed identification was conducted with the use of the comparative collection housed at the UC Santa Barbara Paleoethnobotanical Laboratory and supplemental guides. Wood identification was not conducted in this analysis. Common taxa recovered from the samples include wild cucumber, oak, seeds from the grass family, sunflower family, fire poppy, pondweed, and goosefoot (Gill 2012b:7-8). Seeds made up a large majority of the plant materials recovered from the site, at 99.72% (Gill 2012b:12). Grasslands were predominantly exploited, followed by wetland habitats, and minimal evidence of woodland exploitation (Gill 2012b:12). Gill also provided an assessment of identified plant seasonality which suggests the site may have been predominantly used in the spring and summer when a majority of plant taxon used at the site would have been available (Gill 2012b:9). However, similar to her analysis of Pond, Gill cautions that the sample is small and the results of the analysis should be interpreted with caution (Gill 2012b).

Three Springs Lithic Data

The Three Springs lithic assemblage is comprised of 2,456 artifacts. The lithic assemblage is dominated by Temblor Chert in both debitage and formal tools. The remainder of the assemblage is comprised of basalt, unidentified chert, obsidian,

Monterey chert, Franciscan chert, and to a lesser degree, fused shale, jasper, and quartzite, quartz and other volcanic materials (Table 6-3). At the time of analysis two flakes could not be relocated and are not considered in this analysis.

Table 6-3. Three Springs Lithic Artifact Distribution by Material Type

Artifact Type	Basalt	Franciscan Chert	Fused Shale	Monterey Chert	Obsidian	Temblor Chert	Unidentified Chert	Other	Total
Biface	--	--	--	1	1	7	1	--	10
Projectile Point	--	--	--	--	--	1	2	--	3
Modified Slats	--	--	--	--	--	6	--	--	6
Unmodified Slats	--	--	--	--	--	2	--	--	2
Cobble Tool	3	--	--	--	--	--	--	--	3
Core/ Core Tool	1	--	--	--	--	--	1	--	2
Modified Flake Tool	--	--	--	--	--	1	1	--	2
Utilized Flake Tool	--	1	--	--	1	2	1	--	5
Flake	106	27	18	36	92	1484	69	23	1855
Shatter	50	16	3	13	8	300	45	18	453
Thermal Spall	--	4	--	1	--	96	5	7	113
Total	160	48	21	51	102	1899	125	48	2454

Thirty stone tools were identified in the Three Springs lithic assemblage. As with all the other sites considered in this analysis, chert is the predominant debitage material type. The chert, fused shale, and obsidian flake assemblages, were primarily used in biface technology. Basalt is the second most abundant material at the site, making up the larger cobble processing tools and exhibiting concentrations of debitage from the test pit located at the base of the bedrock mortar.

Cache Cave (CA-KER- 10419)

It is hard to overestimate the spectacular nature of Cache Cave, a Southern California cache site with a unique in situ artifact assemblage. However, given the ongoing investigation of this locale and the current confidentiality of its location, only limited data will be discussed.

The site is located in a steep walled canyon which exhibits a perennial creek (Robinson et al. 2012:8). This site represents the southernmost extent of this research project, located approximately 10 km from *Tashlipun*. The cave is not completely isolated from other activity areas, as bedrock mortars, midden soils, and cupules can be found in the vicinity. The cave itself consist of several large chambers and many smaller crevices. To date, four caves large enough for several people to fit in have been identified in this complex (Figure 6-4). Robinson and colleagues are working to document the cave excavations extensively and remove important artifacts to protect the site from negative impacts from natural rock movement and looters (Robinson et al. 2012:5).

The first documented encounter of the cave was in the late 1990s (David Robinson, personal communication 2016). In 2012, David Robinson and a team of archaeologists and students began the initial excavation of this site. This was followed by additional field seasons in 2014, 2015, and 2016 with an anticipated fifth field season set for summer 2017. To date, two test pits have been excavated in Cave 1, over a dozen units have been excavated in Cave 2, removing most of the easily accessible sediment in the cave, and almost all of Cave 3 has been excavated. Many modern methods have been used to document the cave, such as GIS, 3-D imaging, and photogrammetry of features

and in situ artifacts. In addition, large amounts of soil samples and screen residue samples have been collected due to the high levels of preservation within the cave.

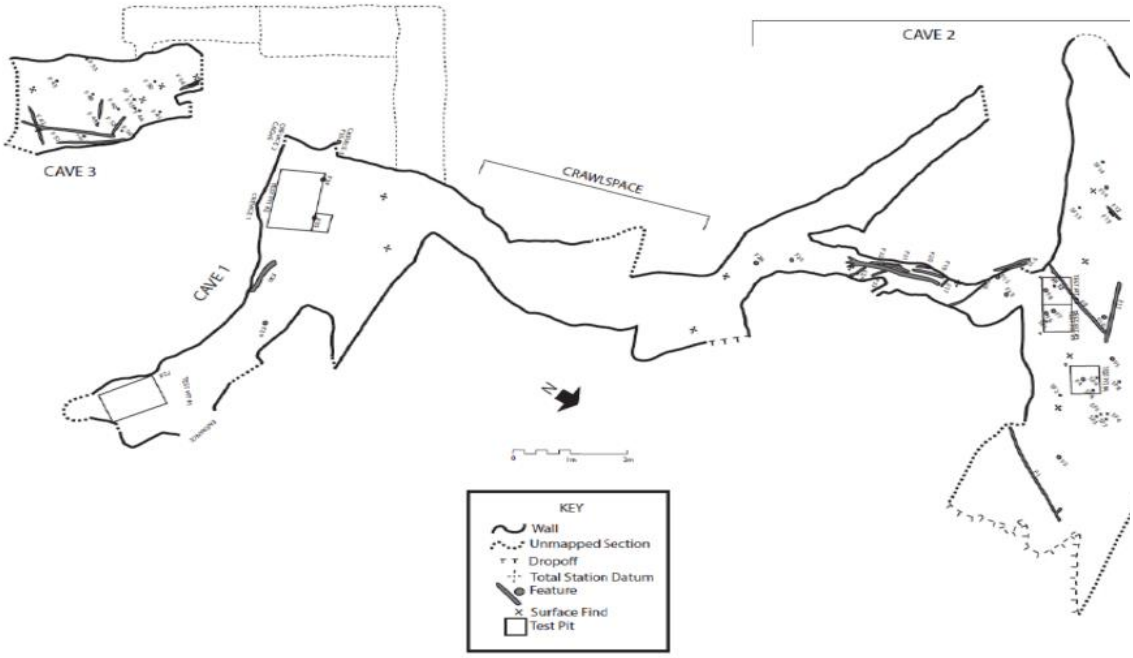

Figure 6-4. Sketch Map of Cache Cave (CA-KER-10419) depicting Cave 1, 2, and 3 (Cockcroft 2015)

AMS dates place most site activity between AD 1300 to 1700; however, there is also evidence of use in the Early and Middle period (David Robinson, personal communication 2016). The assemblage includes perishable goods such as basketry, mats, cordage, and worked wood items, a variety of lithic, bone, and shell artifacts, as well as faunal remains. Work in the cave is still ongoing and the function of the cave in the regional settlement pattern has not been determined, however there currently appears to be evidence that the cave may have served different purposes at different times.

Cache Cave Paleobotanical Data

The soil matrix of the cave is packed with fragments of plant fibers, seeds, and nuts which cannot be immediately disregarded as the workings of local fauna brining

materials into the cave, or being windswept through openings into the cave because of the extraordinary preservation of perishable artifacts. However, the presence of large amounts of small animal bones that are not modified, contemporary rat midden, and evidence of other animal use indicates that the plant remains cannot be assumed to be strictly cultural either. To solve this ambiguity, large samples of soil and processed screen residue samples have been collected for analysis. In addition, samples have been taken from nearby, non-cultural soils, such as rat middens, to generate a comparison of plant use and identify if any plant remains in the cave stand out as cultural compared with the natural matrix.

A preliminary review of the collected data by Virginia Popper provides a glimpse at what full analysis may later reveal. Popper reviewed samples from Cave 2, TP8, level 5 which had been processed by Bernard (Julienne Bernard, personal communication 2016). The materials collected from natural settings around the cave site consisted heavily of ephedra seeds and grass stems. Eriogonum seeds and flowers, atriplex fruits, grass seeds and spikelet's, and phacelia seeds were also common and a few fragments of charcoal and juniper seeds were observed as well (Julienne Bernard, personal communication 2016).

The cave sample, exhibited numerous juniper seeds, some pine nut fragments, leaf fragments, monocotyledon stems, and some ephedra. While ephedra seeds were found in the cave, the stems, known to have been used by people were not observed, suggesting the presence of ephedra is likely due to natural processes. Popper observed very little evidence of charcoal or charred seeds and suggested that food processing was likely not a typical activity in the cave (Julienne Bernard, personal communication 2016). These

early analyses of the paleobotanical remains make no mention of plants that would have been used in basketry production. However, this assessment is a work in progress and should be considered with caution when assessing plant use in the cave.

Another type of the analysis of past use of plants in the cave comes from the identification of the recovered perishable goods, conducted by Edward Jolie, an expert in western basketry construction. In 2013, Jolie examined approximately 200 objects classified as basketry, matting, cordage, or netting. Although more materials have been collected since then, this analysis can be considered a reliable sample. Materials were broken down into artifact type, botanical (unmodified plant parts), and fibers (plants that could not be confirmed as cultural). The details of the basketry analysis conducted by Jolie is not the focus of this thesis and will likely be published at a later time, along with the results of other work still in progress at Cache Cave. The plant identification conducted by Jolie is presented in the Cache Cave paleobotanical results section.

Cache Cave Lithic Data

As of 2015, when the collection was analyzed for this project, the Cache Cave lithic assemblage consisted of 234 artifacts distributed across the cave site. The lithic assemblage is comprised of a wide variety of material types with a high presence of Temblor and Franciscan chert (Table 6-4). Additional lithic materials have been recovered from the cave and will be analyzed as part of the ongoing research at the site.

Table 6-4. Cache Cave Lithic Artifact Distribution by Material Type

Artifact Type	Basalt	Franciscan Chert	Fused Shale	Monterey Chert	Obsidian	Temblor Chert	Unidentified Chert	Other	Total
Biface	--	1	1	--	--	9	--	--	11
Projectile Point	2	1	1	--	--	5	--	1	10
Drill	--	--	--	--	--	4	--	--	4
Knife	--	--	--	--	--	2	--	--	2
Modified Slats	--	--	--	1	--	3	--	--	4
Unmodified Slats	--	--	--	--	--	14	--	--	14
Cobble Tool	--	--	--	--	--	--	--	--	--
Core/ Core Tool	--	--	--	--	--	--	--	--	--
Modified Flake Tool	--	5	2	--	--	2	--	1	10
Utilized Flake Tool	--	2	2	--	--	6	1	1	12
Flake	1	21	4	1	4	27	16	38	112
Shatter	--	--	1	--	--	2	--	49	52
Thermal Spall	--	--	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--	1	1
Total	3	30	11	2	4	74	17	93	234

A total of 67 stone tools have been recovered from Cache Cave. This site exhibits more drills and knives than the other sites in the study and has a significantly smaller number of flakes and shatter respective of the tool assemblage. Temblor chert still dominates the tool assemblage at the site but only makes up around one third of the debitage, suggesting that there is a notable difference in lithic use and production activities occurring at the site.

Discussion

The sites included in this study likely represent unique locations within the settlement pattern practiced by the people who lived at the village of *Tashlipun* (Robinson et al. 2008:23), as discussed previously in Chapter 4.

Tashlipun exhibits evidence of the most extensive occupation of the four sites and was clearly a place where people lived for a large portion of the year engaged in many different activities. Pond is the largest milling site considered in the project, and potentially one of the largest milling sites on the preserve (Robinson et al. 2008). This location is most closely associated with *Tahslipun* and exhibits the clearest evidence of seasonal use, likely occupied for an extended period in the annual cycle. Three Springs also exhibits a number of milling features, but the presence of permanent water sources and an earlier and more extensive occupation suggest that this site may have served as a more permanent occupation site in earlier years of settlement in the San Emigdio Hills, with a transition into a more remote habitation site occupied seasonally later in time. Cache Cave is located furthest south from the sites, higher in the hills and least accessible from *Tashlipun*. This location served as a place for storing items for later use, but may have also served as a place for tool maintenance or other activities, indicated by the presence of stone tool production debris and other activity loci nearby. All four sites considered in this analysis appear have varying ages of occupation, but appear to have some overlap in the Middle and Late period.

The diverse environmental settings, cultural assemblages, and locational relationships between these sites makes them particularly interesting for investigating the organization of basket production in the region. These places were likely used by the

same families through different times of the year and for many different purposes, including craft production. Having reviewed the archaeological setting of this case study, it is time to discuss the results of the analysis.

CHAPTER 7: RESULTS

This chapter presents the results of the experimental usewear program and the analysis of the assemblages from *Tashlipun*, Pond, Three Springs, and Cache Cave. Results from the experimental usewear analysis are presented first, organized by worked material type. This is followed by a review of the contemporary plant communities, paleobotanical data, microwear analysis data, and supplemental artifactual evidence for each archaeological assemblage, organized by site.

Experimental Usewear Results

As stated in the methods chapter (Chapter 5), the purpose of developing this experimental program was to create a comparative collection of usewear for locally available stone materials that can be used to assess the types of materials worked and tasks undertaken with archaeological utilized flakes. The main goal for the experimentation in this study is to determine of it is possible to identify diagnostic evidence of plant processing for use in basketry; specifically, the scraping of medium to medium-soft plant materials that would have occurred in the preparation of plants, like juncus, for use in coiled basketry. The experimental replication of tasks did produce distinct observable usewear on the flakes in many cases, presented below.

Hide

It was not possible to acquire fresh animal hide, so for this experiment, a piece of hard, rolled up, rawhide procured from a local pet store was used. The rawhide was soaked in water for about an hour, producing a pliable, flat piece of hide that could be cut and scraped. The usewear produced from this experiment may not accurately reflect

usewear from prehistoric assemblages, due to the artificial nature of the hide, but the results are presented here in any case.

Cutting Hide

Hide cutting was most successful when the stroke was done in a single slicing direction instead of a sawing back and forth motion. On both the chert and ignimbrite flake, wear developed along both sides of the used margin. The chert flake exhibited short steep microflakes, small and irregular in shape, and a few small scalar microflakes. The ignimbrite flake developed irregular microflakes, a few deep scalar microflakes, irregular breaks, and a few shallow scalar microflakes. No polish or striations were observed, however, the chert flake may have exhibited some evidence of edge rounding. Results of hide cutting usewear are present in Figure 7-1, 7-2 and 7-3.

Scraping Hide

In the scraping experiments, most of the observed wear appeared on a single side of a utilized margin, opposite of the face pressed against the hide. Both the chert and the ignimbrite exhibited some edge rounding through abrasion, with the ignimbrite rounding being more pronounced. The wear was best observed at the highest levels of magnification (134x), likely due to the softness of the worked material, which produced less visible impacts to the stone. Besides rounding from abrasion, margins also exhibited small irregular shaped microflakes and some possible striations. There was limited evidence of contiguous flake scaring associated with scraping activities. However, there was contiguous edge damage of various sorts mentioned above. Results of experimental hide scraping with the utilized flakes are presented in Figure 7-4, 7-5, and 7-6.

Tringham and colleagues (1974) observed that working soft material such as skin and flesh of different species would produce a “slight nibbling” of scalar microflakes visible through the aid of at least 40x magnification (1974:189). They also note that wear from abrasion occurs across most of the used surface, though it is nearly impossible to see under 100x (1974:89). Stevens et al. (2010) also note that edge rounding is attributed to working soft materials (2010:2675). In Figure 7-4 through 7-6, with wear from scraping hide, the margins exhibit the nibbling discussed in Tringham et al. (1974) and the edge rounding attributed to working softer materials. However, the flakes used to cut hide do not exhibit as clear of evidence and could easily be attributed to some other worked material.

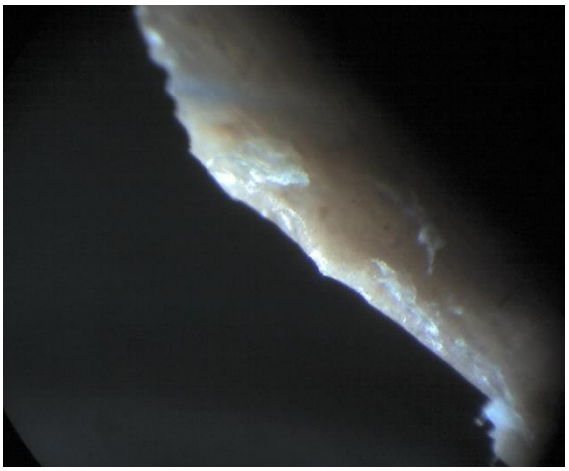

Figure 7-1. 300 Cuts of Hide with Chert (105x). One large scalar microflake and several wide short breaks with step fractures.

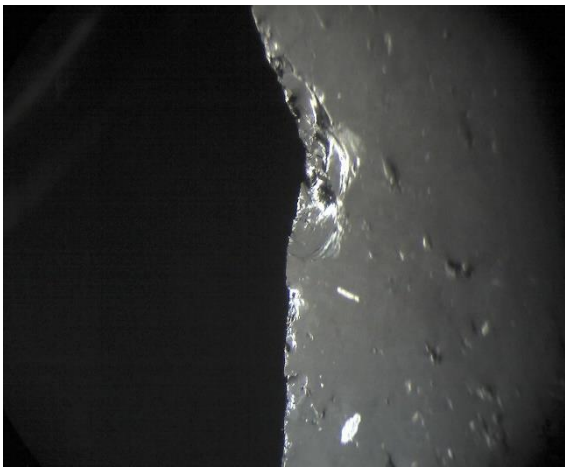

Figure 7-2. 300 Cuts of Hide with Ignimbrite (45x). Three deep scalar microflakes and smaller, shorter scalar microflakes.

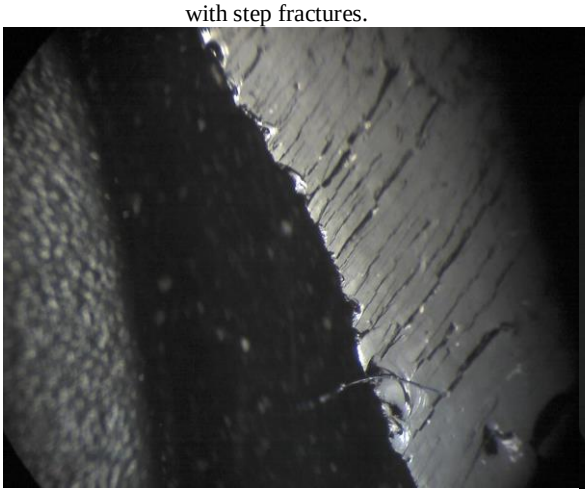

Figure 7-3. 300 Cuts of Hide with Ignimbrite (60x). Numerous irregular microflakes along margin with one larger scalar microflake.

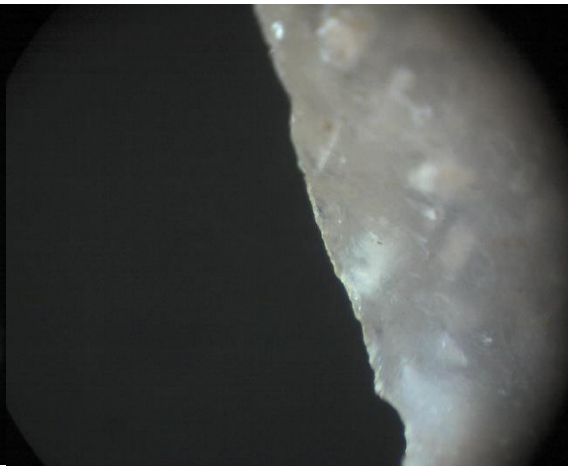

Figure 7-4. 300 Scrapes of Hide with Chert (105x). Fine abrasion and margin rounding and irregular breakage.

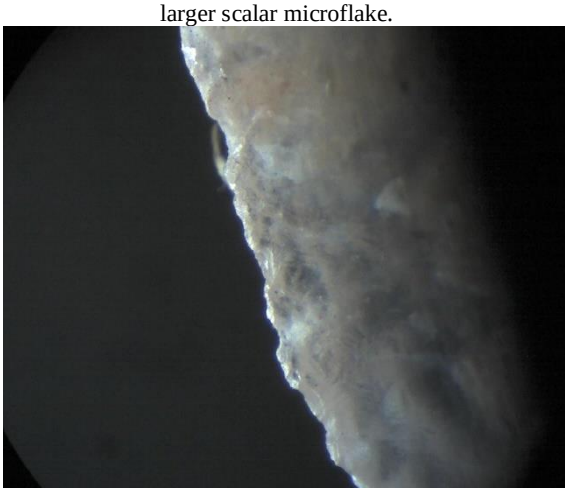

Figure 7-5. 300 Scrapes of Hide with Chert (105x). Scalar and irregular microflakes and margin abrasion.

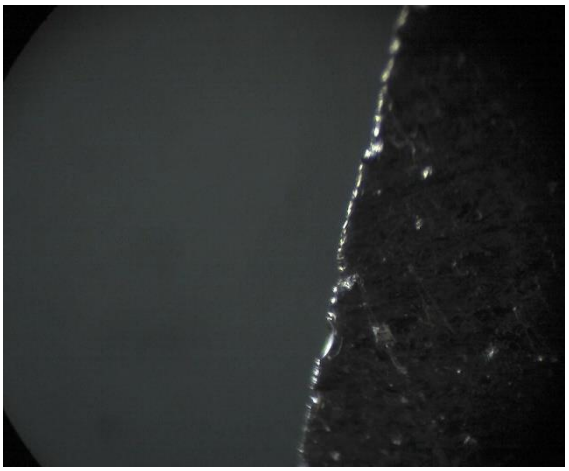

Figure 7-6. 300 Scrapes of Hide with Ignimbrite (134x). Edge rounding from fine abrasion, irregular edge damage, and a dull polish.

Meat

For the meat cutting experiment, raw pork ribs were used and flakes with sharp margins and no cortex were selected. The nature of the worked material required a slight change to the methods; instead of cutting and scraping meat, meat was either cut without bone or cut away from the bone. Only one motion was used for cutting the meat, starting away from the body and pulling the flake towards the body.

Cutting Meat Off Bone

Cutting raw pork meat off bone required holding the ribs up with one hand while cutting the meat off the bone with the other. The meat was intentionally cut along the bone to observe the usewear of simultaneously cutting bone and raw meat. Both the chert and ignimbrite flakes used to cut meat from bone produced rather heavy microflaking along two faces of the utilized margin (Figure 7-7, 7-8, and 7-9). The wear was present along large swaths of the utilized margins in long clusters and consisted of irregular shaped and scalar shaped microflakes ranging from small to large in size. The chert exhibited more step fractures, though both the chert and ignimbrite flake exhibited microflakes with feathered terminations as well. Both flakes exhibited heavy abrasion along the margin with clustered microflaking. The heavy microflaking can be attributed to working the meat from the bone and the two-sided wear is attributable to the cutting motion.

Cutting Raw Meat

Cutting raw meat also produced observable wear on the two faces of the utilized margin. Both flakes exhibited edge rounding and clustered spots of microflaking. The microflakes varied in size between larger and smaller and shapes present included scalar

and irregular, both with feathered terminations. The chert flake used to cut the raw meat developed some edge rounding and no step fractures developed, both consistent with anticipated usewear (Tringham et al. 1974:191). Representative micrographs from raw meat cutting are presented in Figure 7-10, 7-11, and 7-12.

Additional research on processing soft animal materials indicates usewear characteristics likely include “extensive mat polishing, light edge roughening, rare striations, and uneven patterns of small, feather-terminated fractures” (Shea 1987:46). The results of this experimental replication indicate that edge roughening, uneven small, feather termination fractures, and possible mat polish (Figure 7-11) are present.

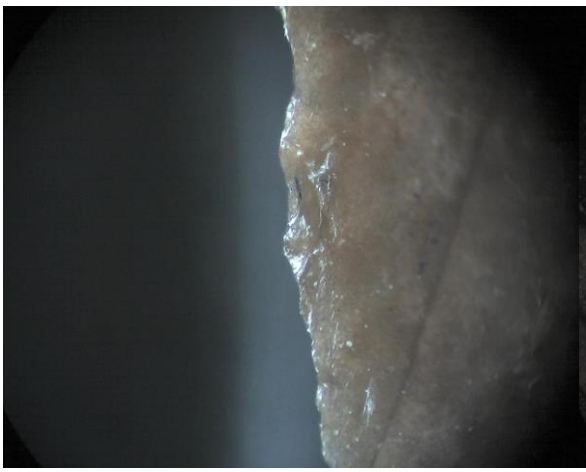

Figure 7-7. 300 Cuts of Meat Off Bone with Chert (67.5x). Cluster of microflakes with step terminations, including scalar, irregular, and triangular shaped microflakes of small and large sizes.

Figure 7-8. 300 Cuts of Meat Off Bone with Ignimbrite (14x). Sets of clustered scalar and irregular microflakes ranging from very small, shallow and short, to longer and deeper.

Figure 7-9. 300 Cuts of Meat Off Bone with Ignimbrite (20x). Cluster of scalar and possibly triangular microflakes along utilized margin opposite of face in Figure 7-8.

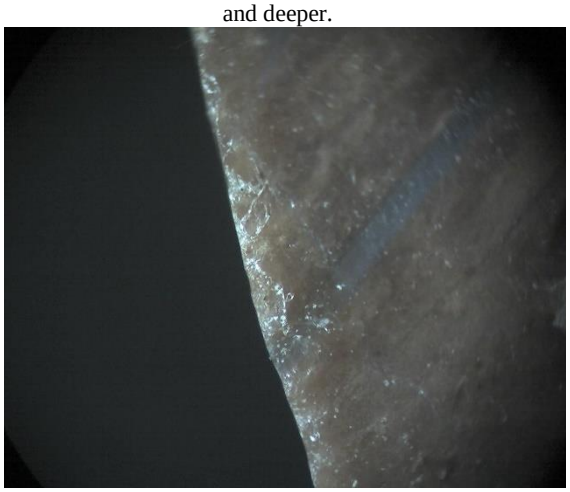

Figure 7-10. 300 Cuts of Meat with Chert (45x). Clustered scalar microflkaing with some short and shallow irregular breakage. Abrassion vissible along margin.

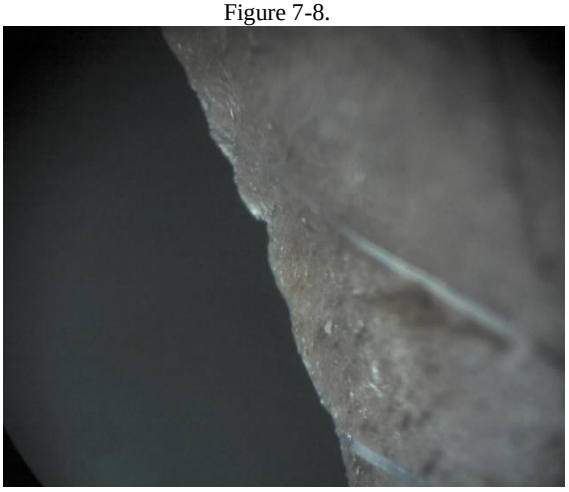

Figure 7-11. 300 Cuts of Meat with Chert (40x). Edge rounding and indeterminate microflaking.

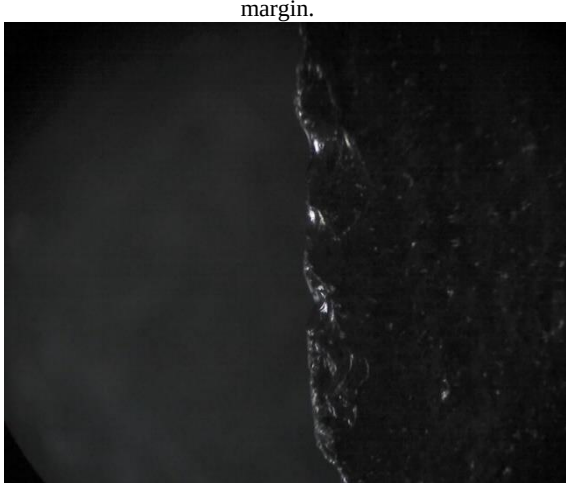

Figure 7-12. 300 Cuts of Meat with Ignimbrite (40x). Scalar microflakes with feathered terminations and margin abrasion resulting in edge rounding present.

Bone

For the bone processing experiments, several small pig rib bones were used. In processing work, the flakes were held with the dorsal side against the thumb and the fingers supporting the ventral side. The rib bones were held perpendicular to the body, and the flakes were moved toward the body, applying moderate to strong downward pressure. Stone materials used to process bone in this set of experimental replications included Monterey chert, like the other experiments, and Coso obsidian, used in the place of Browns Bench ignimbrite.

Cutting Bone

Cutting bone produced very different results with the chert flake than it did with the obsidian flake. The chert flake exhibited only minor evidence of use consisting of two small scalar microflakes with feather terminations on one face of the worked margin and one small shallow scalar microflake on the opposite face of the worked margin. In contrast, the obsidian flake exhibited significant evidence of use. The utilized margin was very heavily abraded, producing a ground down platform look. Additionally, by the 300th cut, one face of the utilized margin exhibited contiguous, layered, scalar microflakes which were wide and short with feathered and step terminations. This significant different in usewear development is likely due to the brittle nature of the margin of an obsidian flake and possible difference is the pressure applied with the flake to the bone. The microflakes consisted of both large and small sizes with varying depths. Figure 7-13, 7-14, and 7-15 present micrographs of bone cutting usewear.

Scraping Bone

Usewear produced from scraping bone was slightly different between the chert and obsidian, the same pattern observed in cutting bone. The chert exhibited considerably less wear than the obsidian, but in both instances, only a single margin was used on the flake and a majority of the wear developed on a single face of the margin. However, the chert flake did not develop the anticipated contiguous microflaking usewear that generally occurs with scraping tasks. The chert wear consisted of light abrasion along the utilized margin, deep scalar and half-moon shaped microflakes, average scalar microflakes with feathered terminations, and steep breaks. The obsidian flake did produce contiguous, steep, overlapping microflakes in scalar shape with feathered termination. Irregular breaks were also observed. The wear was heaviest along the dorsal face in both flakes and only minimal microflakes were observed on the opposing ventral surfaces. Figure 7-16, 7-17, and 7-18 provides micrographs of the usewear developed from scraping bone.

Tringham and colleagues (1974) noted that processing bone was destructive and produced large scalar scars, step scars later in use, frequent abrasion and margin crushing, and a dull polish. They also note that long before 1000 strokes the edge becomes too worn for efficient use (1974:190-191).

Figure 7-13. 300 Cuts of Bone with Obsidian (60x). Flake dorsal surface exhibiting contiguous, layered, scalar microflakes with a heavily abraded margin.

Figure 7-14. 300 Cuts of Bone with Obsidian (37.5x). Ventral surface of utilized margin exhibits no microflakes or polish, however, the margin is nearly flat from heavy abrasion and exhibits extensive damage.

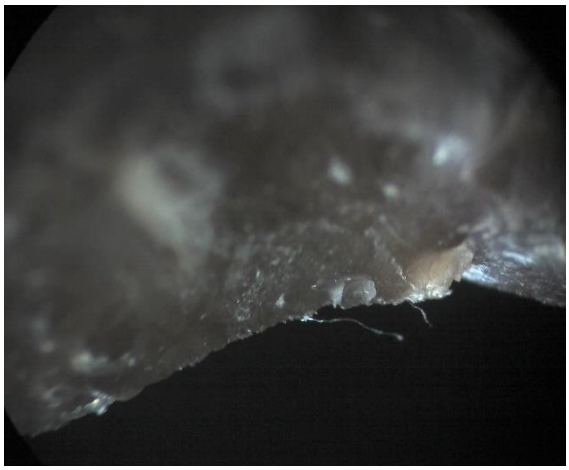

Figure 7-15. 300 Cuts of Bone with Chert (60x). Two small, scalar microflakes with feather terminations on dorsal face of utilized margin.

Figure 7-16. 300 Scrapes of Bone with Chert (25.5x). One larger, deep, half-moon microflake, smaller scalar microflakes, feathered terminations and edge breakage.

Figure 7-17. 300 Scrapes of Bone with Obsidian (14x). Contiguous, steep, scalar microflakes and edge abrasion.

Figure 7-18. 300 Scrapes of Bone with Chert (30x). Margin abrasion, a single scalar microflake with feather termination on face opposite heavy wear depicted in Figure 7-17.

Wood

California willow was experimentally worked with the goal of making a promontory peg, as discussed by Crabtree and Davis (1968). Having a set goal in mind, such as making a promontory peg, helps to keep task motions regular, which can have an impact on how usewear develops (Odell 2003:137). Production required scraping the branch to be straight and round, cutting the branches into 10 cm long pieces, notching the middle, top, and bottom of the piece.

Cutting Wood

Cutting wood into 10 cm segments was done with a back and forth sawing motion with the chert flake and a unidirectional motion where the branch was twisted under the margin for the obsidian flake. Notches were made with unidirectional cuts that began away from the body and moved towards the body. For this experimental replication, one cut was defined as a movement in a single direction. Although the chert and the ignimbrite were used slightly differently to cut the wood, they developed usewear that shared a number of characteristics. Both the chert and ignimbrite flakes developed clustered spots of usewear along both faces of the utilized margin which consisted of moderate abrasion along the margin, small scalar and irregular shaped microflakes, edge crushing, and sheer breaks. However, the chert flake also developed some deep scalar microflakes and possible gloss. Figure 7-19, 7-20, and 7-21 depict representative usewear from the wood cutting experiments.

Scraping Wood

Wood was scraped to remove any imperfections or bumps from the cut branches. Scraping was done in a unidirectional motion, starting near the top of the branch, close to the body and moving along the surface away from the body. Both the chert and the ignimbrite flakes exhibited wear predominantly on the face of the utilized margin that was not pressed against the worked material. While the ignimbrite flake developed the contiguous microflaking anticipated from scraping tasks, the chert flake did not. Additionally, the chert flake developed a few trapezoidal microflakes which are indicative of working wood (Tringham et al. 1974:191). The flake margins used in the scraping process were selected to be slightly thicker and had cortex on the dorsal surface. It is possible that this resulted in limited presence of usewear n these flakes. Figure 7-22, 7-23, and 7-24 depict representative usewear from the wood scraping experiments.

Figure 7-19. 300 Cuts of Wood with Chert (25x). Two short scalar flakes with feather terminations and irregular breakage.

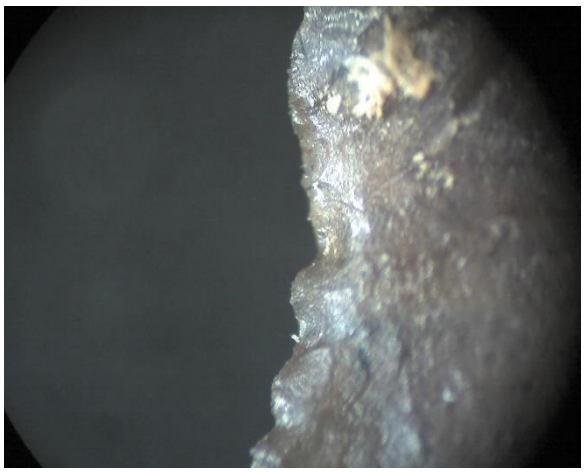

Figure 7-20. 300 Cuts of Wood with Chert (97x). Small scalar microflakes, deep semi-circular scalar microflakes with feather terminations and deep irregular microflakes with feather terminations.

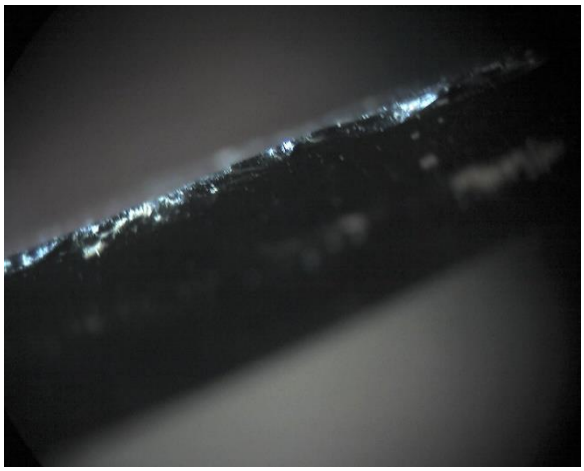

Figure 7-21. 300 Cuts of Wood with Ignimbrite (30x). Margin abrasion in the form of crushing and sheer breaks; one scalar microflake observed.

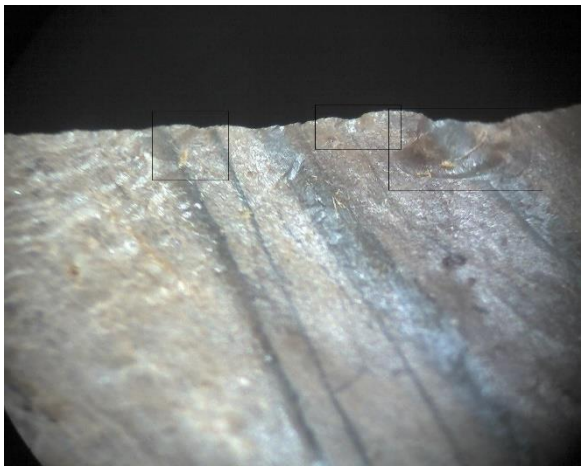

Figure 7-22. 300 Scrapes of Wood with Chert (37.5x). Two trapezoidal microflakes and a small scalar microflake on the dorsal surface of the flake.

Figure 7-23. 300 Scrapes of Wood with Chert (37.5x). A small scalar microflake and a larger irregular microflake on the dorsal surface of the flake.

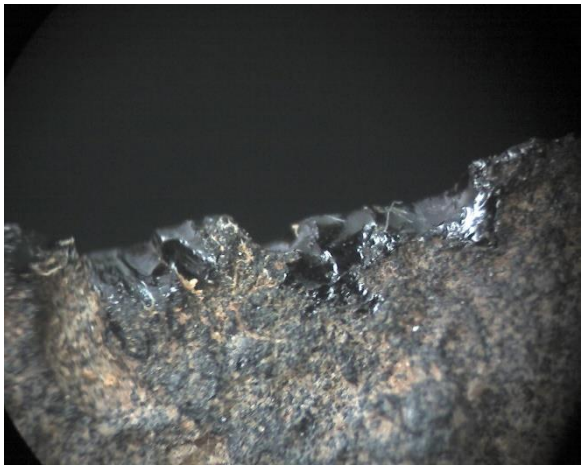

Figure 7-24. 300 Scrapes of Wood with Ignimbrite (40x). A cluster of contiguous steep scalar microflakes and irregular breakage. One microflake appears to have a half-moon or semi-circular shape.

Yucca

Cutting Yucca

The convex lateral margins of selected flakes were used to cut the yucca, with the distal end facing away from the body. The leaves of harvested yucca were cut in a lateral manner, replicating the motion of cutting the leaf from the plant. Both single direction and back and forth sawing motions were used. In these replicative experiments, chert exhibited much less usewear than the ignimbrite. On the chert flake, both faces of the utilized margin exhibited sporadic scalar microflakes, irregular microflakes, and edge damage. The presence of edge damage on both faces, though minimal, is representative of a cutting motion. The ignimbrite flake also exhibited wear on both faces of the utilized margin, however, there was a much heavier presence of edge damage on the ventral face than the dorsal face. The dorsal face exhibited dispersed small scalar microflakes with feathered terminations, and clusters of irregular edge damage. On the ventral face, contiguous wear along the entire utilized margin is present, consisting of short, irregular microflakes, some of which are deep and exhibit rings of percussion and step terminations, scalar microflakes of different sizes with feathered terminations, and short steep irregular microflake. The buildup of wear predominantly on one face may be related to the angle at which the flake was held in use. Another notable aspect about ignimbrite yucca cutting wear is the heavily abraded margin along the entire utilized surface. Figure 7-25, 7-26, and 7-27 present micrographs of yucca cutting usewear.

Scraping Yucca

While yucca cutting was done to replicate harvesting leaves, yucca scraping was done to replicate processing the leaves for the strong fibers that Native California people used for many purposes, including making baskets. Scraping tasks were completed by holding the flake with the dorsal surface against the plant and dragging the distal half of the flake longitudinally across the leaf to separate individual strands. The work was done with a plastic cutting board backing the leaf and scraping was done in a single stroke starting away from the body and moving towards the body.

As expected, microwear developed most heavily on the ventral surface of both flakes, the face opposite of the surface placed against the worked material. This wear for both the chert and ignimbrite flake consisted of nearly contiguous wear, including small, medium, and large scalar microflakes with feathered terminations, a few short steep breaks, and a few irregular microflakes. Again, the ignimbrite flake exhibited more extensive and varied wear, consisting of the wear discussed, as well as at least one trapezoidal microflake, layered irregular flakes, and deep scalar microflakes. Microflaking on the dorsal surfaces of both flakes is almost nonexistent, with a single irregular microflake observed on each flake. The margins show moderately heavy abrasion which does not appear to extend onto the dorsal surface. The chert flake abrasion is more fine and exhibits some evidence of rounding. No polish or striations were apparent in this analysis. Figures 7-28, 7-29, and 7-30 present examples of microwear from scraping yucca with a flake.

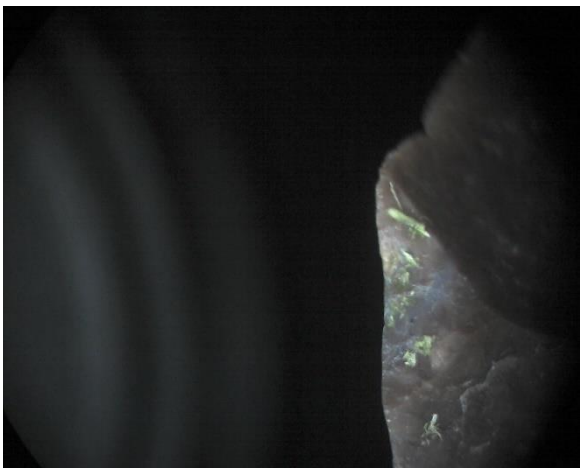

Figure 7-25. 300 Cuts of Yucca with Chert (14x). A cluster of scalar microflakes in a broken face with yucca residue.

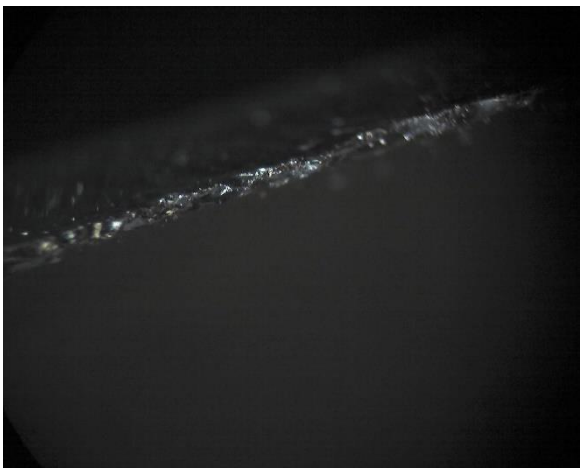

Figure 7-26. 300 Cuts of Yucca with Ignimbrite (39x). Heavily abraded margin which show some rounding, crushing, and sheer breakage.

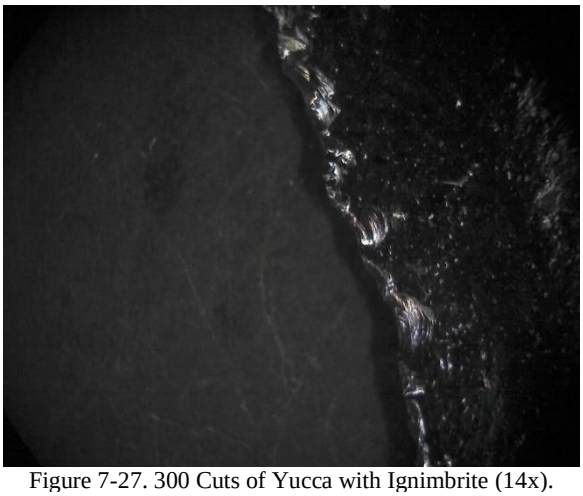

Figure 7-27. 300 Cuts of Yucca with Ignimbrite (14x). Contiguous scalar and irregular microflakes with feathered terminations, steep breaks, and edge crushing or abrasion.

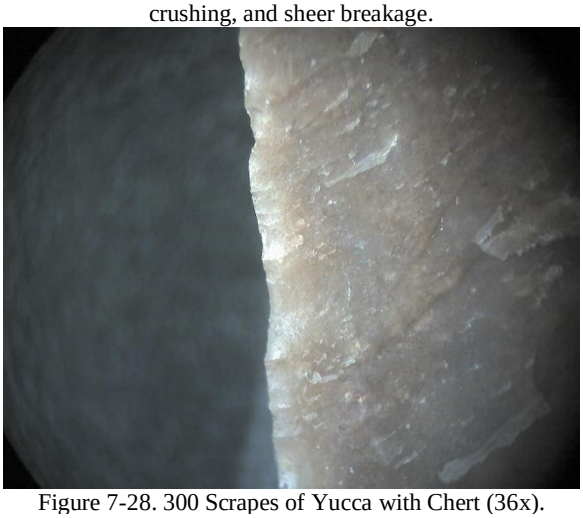

Figure 7-28. 300 Scrapes of Yucca with Chert (36x). Contiguous microwear consisting of 3 to 4 small scalar microflakes, 1 large microflake, and irregular breakage on ventral surface.

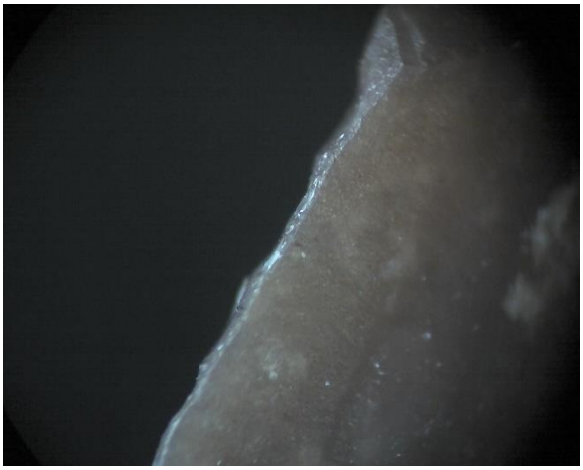

Figure 7-29. 300 Scrapes of Yucca with Chert (70.5x). Dorsal face, used against the worked material exhibits no microflaking. Ventral face shows moderate abrasion and margin shows some edge rounding.

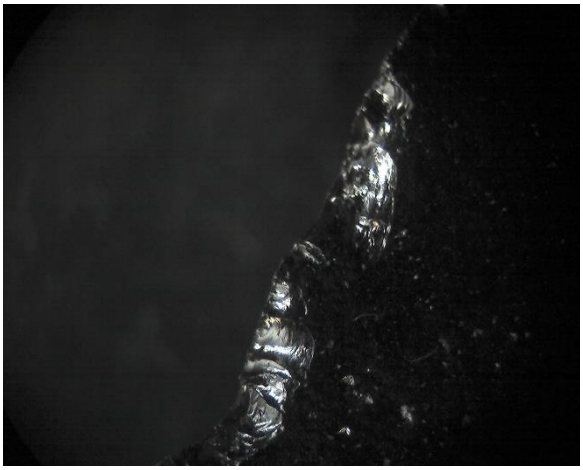

Figure 7-30. 300 Scrapes of Yucca with Ignimbrite (14x). Contiguous, overlapping scalar microflakes with feathered terminations, irregular edge morphology, a few smaller irregular microflakes with feathered terminations.

Juncus

Up to this point, results of the replicative experimentation conducted on common worked materials, not directly relevant to the research question, have been discussed. Because this study is focused on identifying basket production, and juncus is one of the most common plants used by the Chumash to make baskets, more detail is provided for the experimental processing of juncus. The general process for preparing juncus for weaving was previously described in detail in Chapter 3 therefore, in this chapter, only a brief discussion of flake use is provided and more information is given for the usewear patterns.

Cutting Juncus

Various types of cutting methods were used to trim the juncus including unidirectional and sawing motions. Swift unidirectional cuts were more successful at slicing the plant. Generally, unsplit, dried strands were cut but the last 50 cuts were made on split strands of juncus that had been soaked in water. Cutting the juncus in these two conditions replicated how they might be cut in basket production; either to remove unwanted pieces of the whole plant or to trim the strands of juncus used in weaving.

In the process of cutting the juncus for the first 100 strokes, both the chert and ignimbrite flakes incurred broken edges that were macroscopically visible. Usewear was minimal and not easily identifiable after 100 cuts with the chert flake, possibly due to the hardness of the material. However, some short wide scalar microflakes with step terminations did develop on both faces. For the ignimbrite flake, portions of the utilized edge exhibit crushed and irregular margins that may have been broken in the sawing motion. No scalar flakes were observed, but shallow trapezoidal stepped microflakes are

present on the edge. Microwear consisted of a clustered mixture of small irregular breaks with step terminations on both faced of the utilized margin of both flakes. Figure 7-31 and 7-32 present usewear

After 300 cuts, the utilized margins continued to develop more visible usewear on both flake materials. This increased wear was visible in clustered segments on both faces of the used margin. By 300 cuts of juncus with the ignimbrite flakes, the edge morphology had increased in irregularity, giving the appearance of a serrated edge. There was also the continued presence of more trapezoidal shaped microflakes which are more diagnostic of harder plant materials such as wood (Tringham et al. 1974). The hardness of the dried juncus may have resembled certain characteristics of wood, which produced the trapezoidal microflakes. The chert flake developed clusters of deep but short irregular shaped microflakes. The edge damage appeared on both sides of the flake although it was heavier on one side than the other for both flake materials. This may have occurred from a particular angle of use. Usewear micrographs from 300 cuts are presented in Figure 7-33 and 7-34.

Ultimately, cutting juncus with both materials resulted in irregular edge damage on both sides of each utilized flake. No edge rounding, polish, or gloss was observed but the margins did show evidence of abrasion. The edge damage that did result was clusters of irregular microflakes with step terminations, a few trapezoidal flakes, and small short scalar microflakes. The wear is similar to that observed in Figure 7-27 which depicts wear from 300 cuts of yucca with an ignimbrite flakes.

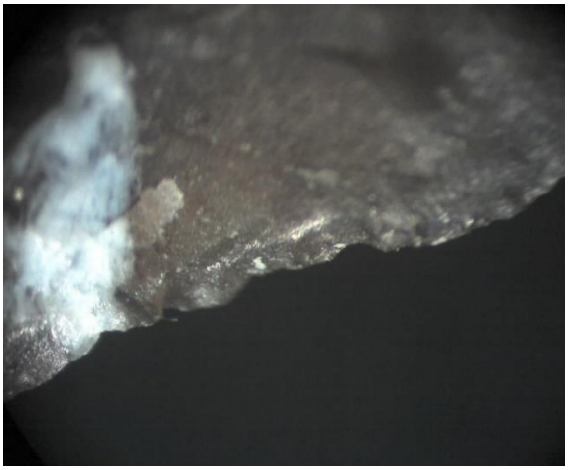

Figure 7-31. 100 Cuts of Juncus with Chert (105x). Short, wide scalar microflakes with step terminations.

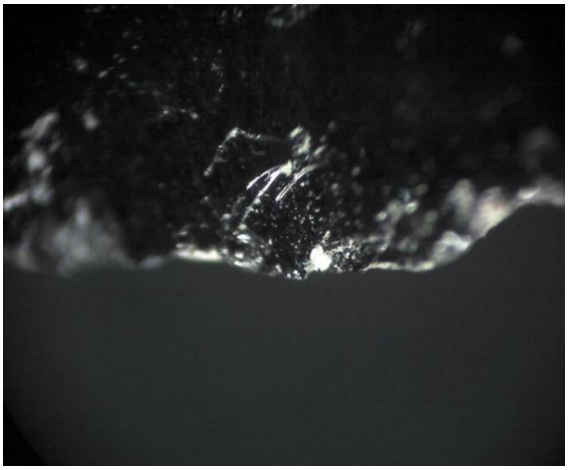

Figure 7-32. 100 Cuts of Juncus with Ignimbrite (75x). edge crushing and layered microflakes, including one trapezoidal microflake.

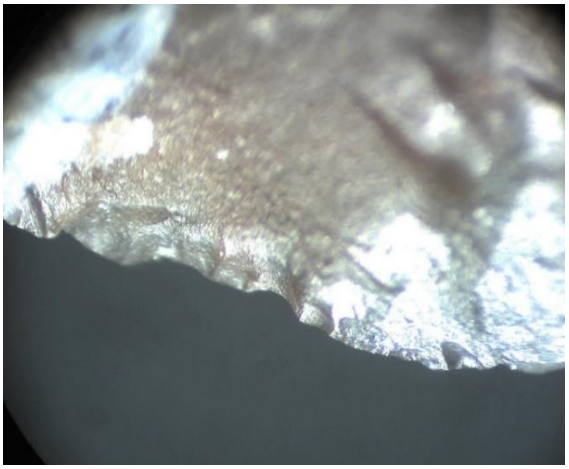

Figure 7-33. 300 Cuts of Juncus with Chert (112.5x). Cluster of short, deep irregular microflakes with step terminations and a few small scalar microflakes with feathered terminations.

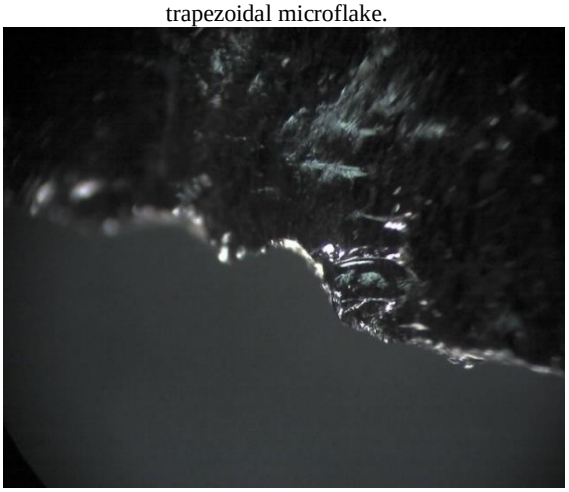

Figure 7-34. 300 Cuts of Juncus with Ignimbrite (60x). Irregular margin with evidence of abrasion and a cluster of layered microflakes.

Scraping Juncus

For the scraping of this material the split juncus was held in hand, using the thumb to back the juncus as it was scraped (Figure 5-5). The interior of the split juncus strands were scraped to remove extra pith. Occasionally the juncus was placed on a piece of thick tanned leather. When using the flat surface of the leather, sometimes the flake would grind against the leather. This could have impacted the usewear, but it is possible that people in the past may have occasionally placed the juncus on a flat surface to scrape. Also the scraping would occasionally cut the juncus as well as trim the sides to make it all the same width. This is consistent with ethnographic materials which discuss using the scraping implement to trim the strands to consistent widths.

For the chert piece, a single side of the flake was used for the first 100 scrapes of juncus. The ventral side faced the body. A thin flat edge and two protruding points around that flat edge were used to do the scraping. The flake was moved from close to the body to away from the body or the flake was placed against the leg and the juncus was run underneath the flake towards the body. The protruding points were used to scrape out the rounded strands of juncus and the flat face to scrape out the flatter strands of juncus.

The resulting usewear after the first 100 scrapes consisted primarily of irregular scalar microflaking along the utilized surface (Figure 7-35). Plant residue was also visible stuck to the edge of the flake. At this point, no rounding or polish was observed. Usewear was visible on both the ventral and dorsal sides of the utilized edge with no clear emphasis on one side of the other. The flake was used to scrape the juncus similarly for the following 200 strokes. However, the flake was also rotated to use points closer to the platform that had a more convex surface that could get into slightly curved juncus

strands. This portion was also thicker and did not break as easily although it was possible to hear some fragments of the edge of the flake break off during use. During much of the scraping the ventral side of the flake faced the body. Processing was consistent with directionality in that the flake was always pulled away from the body in a scraping.

After 300 scrapes with the chert flake, the usewear was most prominent on the dorsal surface which was facing away from the worked material at all times. The wear consisted of small contiguous scalar microflakes which were relatively short and steep (Figure 7-36). This resulted in the appearance of rounding on the edge. On the ventral surface, which was pressed against the juncus at all times, there are irregularly spaced scalar microflakes along the edge. No striation or polish was noticed. Again, the edge appears to exhibit the start of rounding from a light abrasion.

For scraping tasks with the ignimbrite flake, a single long flat margin was used consistently because the form was well-suited to accomplish the task. Scraping of juncus with the ignimbrite flake produced a much more consistent microwear signature at a more rapid rate than the one developed with the chert flake by the first 100 scrapes (Figure 7-37). The usewear present on the ignimbrite flake consisted of contiguous scalar microflakes which occurred predominantly on the face of the flake opposite from the face that was pressed against the strands. These scalar flakes exhibited feathered terminations but they came off in such rapid succession as to round the edge of the margin on the face opposite the worked juncus. This rapid scalar microflaking continued to develop on the margin after 300 scrapes of the juncus (Figure 7-38). This wear does not seem to have appeared on the cutting or scraping of any other material processed in this experiment.

Such results suggest that this usewear may be diagnostic of tasks for scraping plant materials with a hard exterior and soft interior.

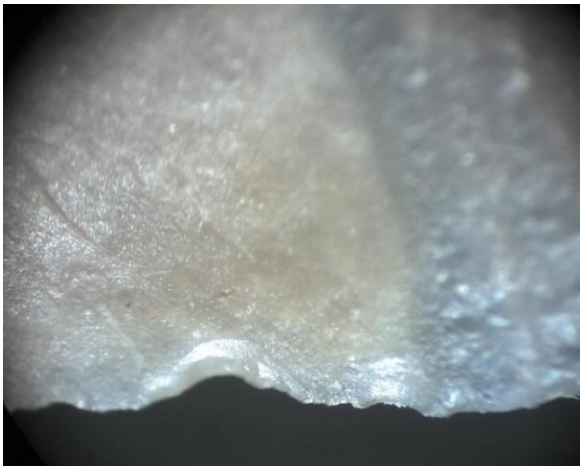

Figure 7-35. 100 Scrapes of Juncus with Chert (105x). Irregular margin with discontinuous scalar microflakes. Microflakes are short and wide with feathered terminations.

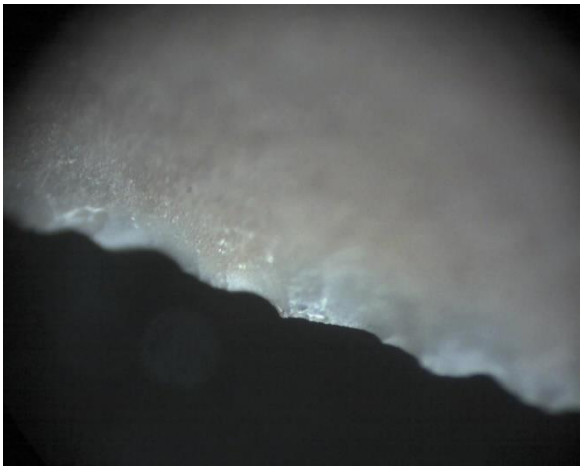

Figure 7-36. 300 Scrapes of Juncus with Chert (75x). Contiguous scalar microflakes which are short and wide with feathered terminations. There is overlap between flake scars. These microflakes appear more shallow than those on the ignimbrite flakes.

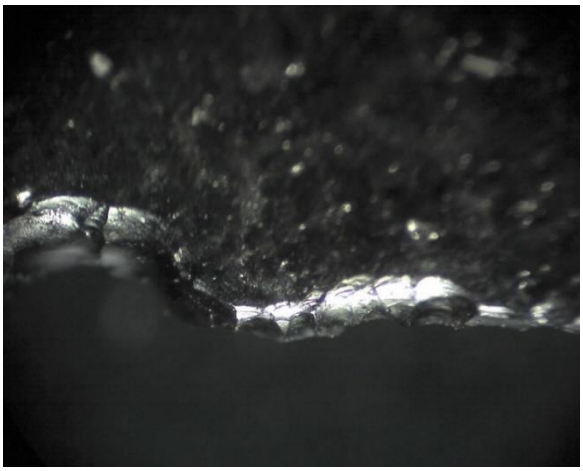

Figure 7-37. 100 Scrapes of Juncus with Ignimbrite (90x). Irregular margin with contiguous, overlapping scalar microflakes which are relatively steep with feathered terminations.

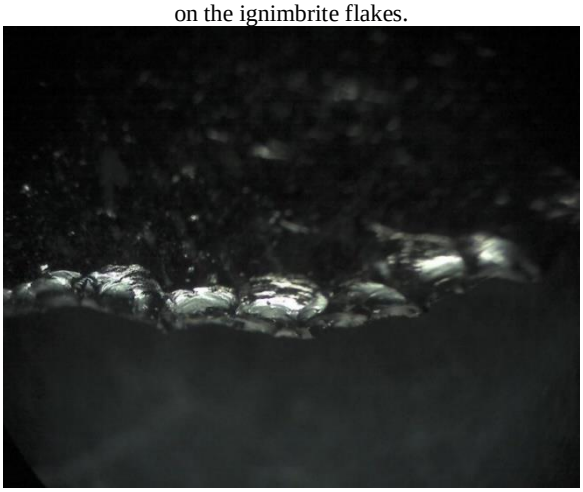

Figure 7-38. 300 Scrapes of Juncus with Ignimbrite (45x). Contiguous, steep, scalar microflakes with feathered terminations.

Discussion of Experimental Usewear Results

The experimental cutting and scraping tasks on a wide variety of materials in this study indicates that identifiable usewear does develop on utilized flakes used for relatively short periods of time. Further, there is good evidence that microwear often develops differently based on task and can be used to make inferences about possible worked materials. These results are consistent with many previous studies on microwear analysis. Table 7-1 provides a brief summary of the usewear observed on the utilized flakes from the experiments.

Table 7-1. Experimental Usewear Analysis Results

Worked Material	Task	Diagnostic Usewear Patterns	
		Chert	Ignimbrite*
Hide	Cut	Wear on both faces of worked margin; small irregular shaped short steep microflakes; few small scalar microflakes; edge rounding	Wear on both faces of worked margin; irregular microflakes, a few deep scalar microflakes; irregular breaks; few shallow scalar microflakes
	Scrape	Most wear on a single face of utilized margin; edge rounding; small, irregular edge damage along margin	Most wear on a single face of utilized margin; edge rounding; small, irregular edge damage along margin
Meat	Cutting Meat Off Bone	Heavy microflaking along two faces of the utilized margin; clustered patterning along margin; large and small irregular and scalar microflakes; heavy abrasion	Heavy microflaking along two faces of the utilized margin; clustered patterning along margin; large and small irregular and scalar microflakes; heavy abrasion
	Cutting Raw Meat	Wear on the two faces of the utilized margin; small and large irregular and scalar microflakes with feathered terminations; edge rounding	Wear on the two faces of the utilized margin; small and large irregular and scalar microflakes with feathered terminations
Bone	Cut	Minimal evidence of use consisting of two scalar microflakes with feathered terminations on one face and one small shallow scalar microflake on the opposite face	Utilized margin heavily abraded; contiguous, layered, wide and short scalar microflakes with feathered and step terminations
	Scrape	Wear mainly on one face of utilized margin; light abrasion along the utilized margin, deep scalar and half-moon shaped microflakes, average scalar microflakes with feathered terminations, and steep breaks	Wear mainly on one face of utilized margin; contiguous, steep, overlapping microflakes in scalar shape with feathered termination; irregular breaks

Table 7-1. Experimental Usewear Analysis Results

Worked Material	Task	Diagnostic Usewear Patterns	
		Chert	Ignimbrite*
Wood	Cut	Wear along both faces of utilized margin; clustered patterning; small scalar and irregular shaped microflakes; abrasion; some deep scalar microflakes and possible gloss	Wear along both faces of utilized margin; clustered patterning; small scalar and irregular shaped microflakes; abrasion
	Scrape	Wear along one face of utilized margin; few trapezoidal microflakes	Contiguous wear along one face of utilized margin; contiguous microflaking
Yucca	Cut	Less wear than Ignimbrite; both faces of the utilized margin exhibited sporadic scalar microflakes, irregular microflakes, and edge damage	Wear on both faces of utilized margin; heavier presence of edge damage on ventral face; dorsal face exhibited dispersed small scalar microflakes with feathered terminations and clusters of irregular edge damage; ventral face showed contiguous wear along utilized margin consisting of short, deep irregular microflakes with step terminations and scalar microflakes of different sizes with feathered terminations; heavily abraded margin along the entire utilized surface
	Scrape	Wear developed most heavily on face of flake opposite worked surface; nearly contiguous wear, including small, medium, and large scalar microflakes with feathered terminations, a few short steep breaks, and a few irregular microflakes; fine abrasion and rounding	Wear developed most heavily on face of flake opposite worked surface; nearly contiguous wear, including small, medium, and large scalar microflakes with feathered terminations, a few short steep breaks, and a few irregular microflakes; trapezoidal microflake; layered irregular flakes; deep scalar microflakes; heavy abrasion on one face
Juncus	Cut	Wear on both faces of utilized margin; clustered patterning; short, wide, scalar microflakes with step terminations; light abrasion	Wear on both faces of utilized margin; clustered patterning; edge crushing; irregular margins; trapezoidal microflake; light abrasion
	Scrape	Usewear most prominent on face opposite worked material; small contiguous scalar microflakes which were relatively short and steep; abrasion and appearance of edge rounding	Usewear most prominent on face opposite worked material; contiguous scalar microflakes with feathered terminations

*Obsidian used in place of ignimbrite to process bone.

As expected, in most cases task action was identifiable based on wear patterns. Cutting tasks in many experiments resulted in clustered wear along both faces of the

utilized margin and scraping wear resulted in limited wear on the face against the worked material with much of the wear developing in a contiguous manner across the face opposite of the worked material (Tringham et al. 1974). This indicates that such patterning can be used to successfully identify task use for archaeological utilized flakes.

Identifying the type of material worked based on the experimental results requires more caution and settling for limited detail. Generally, the relative hardness of worked material can be inferred based on the amount of wear and type of wear patterns present. As an example, results indicate that cutting and scraping soft hide produced microwear that was not easily visible with the incident light microscope with a magnification range that extended only to 135x. However, with the available magnification, this worked materials produced very small edge 'nibbling' (Tringham et al. 1974) and finely abraded margins which appear rounded. Conversely, cutting and scraping bone, a much harder material, resulted in heavily abraded margins and larger more visible microflakes. Meat processing, which included cutting flesh and removing flesh from bone, produced wear in between these two extremes, with some fine abrasion to heavier abrasion and an increased presence of irregular and scalar microflakes with feathered terminations. In this way, hardness of material worked by archaeological utilized flakes can be inferred with moderate success, and tentative interpretations of the types of worked material can be suggested based on comparing the patterning of this experimental study and other studies with the observed archaeological patterns. However, the worked material type interpretations should be viewed with caution. The use of additional microscopic techniques which could identify polish types and striation could provide more confidence in interpretation of worked material type.

While they may have served several different technological functions, the three plant types included in this study, wood, yucca, and juncus, each have known uses in Native California basketry traditions. Although it would be ideal to be able to distinguish among these three types of plants, being able to confidently distinguish plant working usewear from other worked materials serves as a good foundation for suggesting that a site was used to process plants, potentially, for use in basketry. The results of this study indicate that wood produced limited diagnostic usewear, but that yucca and juncus produced wear patterns which were similar to each other and distinct from other worked materials.

Wood processing resulted in irregular breakage and a few semi-circular and trapezoidal microflakes that appear different from other usewear patterns. This usewear is consistent with patterns for wood working presented by Tringham et al. (1974), but generally, the wood produced less pronounced wear than expected. This may be due to the type of activity the flakes were used for in processing the wood, namely, making promontory pegs. Wood is such a common material used for making a wide range of tools and objects that identifying the processing of this material does not automatically indicate that basket production occurred at a site. Other types of wood working and the use of different types of microscopic technology would be beneficial in developing a more confident interpretation of wood working usewear. Yucca and juncus both exhibit tough exteriors with soft interiors and produced strikingly similar usewear patterns. Depending on the part of the plant worked, or the processing task, this wear could be interpreted as the result of processing medium, soft/medium, or medium/hard materials. Particularly similar is the wear from scraping these plants, which produced almost no

wear on the face closest to the worked material and contiguous, steep, scalar microflakes with feathered terminations and overlapping on the face opposite of the worked material. This is unique in this experimental replication to these materials and may be a good indicator of scraping soft plant materials in the past if identified on archaeological utilized flakes. It is worth restating at this point that scholars have observed that scraping plant materials is not associated with processing activities attributed to subsistence activities in the past (Miller 2014: 298). Therefore, identifying this particular type of wear in the archaeological assemblages has the greatest potential for indicating that some type of plant processing for fiber technology production occurred there in the past.

The replicated wear patterns produced in this experiment provide a controlled sample with which to compare with the prehistoric assemblages (Bamforth 2010; Elzinga 2011; Keeley 1980; Shea 1992). The range of tasks conducted with flakes is anticipated to represent a large swath of potential activities in which utilized flakes might have been used. This comparative collection can be used to interpret the way utilized flakes from archaeological assemblages at the four sites in this study may have been used.

Archaeological Site Analysis Results

The following section presents the results of the analyses conducted on assemblages from the four sites in this study, *Tashlipun* (CA-KER-188H), Pond (CA-KER-1635), Three Springs (CA-KER-3388), and Cache Cave (CA-KER- 10419). This discussion is organized by site, providing the results for each assemblage by type. First, evidence of plant use for basket production is presented, including observations of contemporary plant populations and paleobotanical evidence. This data is also used to determine potential site use seasonality, which can indicate what type of production

would be most likely to occur at the location based on the model discussed in the theory chapter (Chapter 4). Following this is the results of the lithic assemblage usewear analysis, focusing on identifying utilized flakes that may have functioned to process juncus, willow or sumac to make weaving fiber for coiled baskets. As stated previously, there is a stronger focus on usewear from juncus processing in this analysis because the usewear signature appears relatively distinct from other worked materials in the experimental portion of the project and because wood cutting and scraping usewear could be the result of any number of tasks. However, the results of the experimental usewear analysis indicated that yucca also produced wear like that of juncus processing. Ultimately, identifying scraping wear associated with the processing of these soft plants can be used to infer some type of fiber technology production. Finally, a review of other tools at the site that are related to basketry production is provided. These additional tools were not subjected to detailed analyses, but identifying the presence and quantity of tools that could be associated with different stages of basket production helps to pinpoint the stages of basket production, if any, that occurred on site.

***Tashlipun* (CA-KER-188H)**

Presented below is an evaluation of the evidence for basket production at the village and a discussion of what stages of manufacture might have occurred at the site in the past.

Contemporary Plant Communities

This site is situated in close proximity to many rich ecological habitats. The canyon floor where the site sits is predominantly a grassland habitat. Surrounding hills exhibit a chaparral environment as well as grasslands. These arid plant communities are

bisected by San Emigdio Creek which flows through the area, supporting riparian biota. Oaks and willows grow well in this habitat and photographs of the area from the early 1900's depict several oaks growing on the site which have since been chopped down (Bernard 2008:239-240). During a visit in July 2016, I surveyed the site and the immediate vicinity to identify plants that could have been used for basket production. Both juncus and willow grow along the trail one takes to the site from the road. I did not see any evidence of deer grass or sumac at the site, however, my investigation of plants was limited and the materials may have grown nearby. Though modern plant distribution does not likely reflect the exact plants that were present in the past, the presence of juncus and willow today suggests that they could have grown there in the past. This suggests that the village had potential to be a harvesting locale.

Paleobotanical Results

As discussed in the previous chapter, paleobotanical samples were taken from *Tashlipun* to establish the uses of plants at the site. Eleven samples, from three units, making up 28 liters of soil, were collected for analysis (Bernard 2008:241). Thirty-one plants were identified to the level of family, genus, or species (Table 7-2).

Table 7-2. Plants Identified in Paleobotanical Samples from *Tashlipun*

Scientific Name	Common Name
Amsinckia sp.	fiddleneck
Asteraceae	sunflower family possibly sagebrush
Atriplex sp.	saltbush
Brassicaceae	mustard family
Bromus sp.	brome grass
Calandrinia ciliata	red maids
Chenopodium sp.	goosefoot
Cheno-Am	goosefoot, pigweed, & others
Claytonia sp.	miner's lettuce
Cyperaceae*	sedge family
Eriogonum sp.	wild buckwheat
Fabaceae	legume

Table 7-2. Plants Identified in Paleobotanical Samples from *Tashlipun*

Scientific Name	Common Name
Hemizonia sp.	tarweed
Lepidium sp.	peppergrass
Malvaceae	mallow family
Marah macrocarpus	wild cucumber
Papaver sp.	poppy
Phacelia sp.	phacelia
Physalis sp. cf.	ground-cherry
Pinus sp.	pine
Poaceae	grass family
Polygonum sp.	knotweed
Populus/Salix sp.*	poplar/willow
Pseudotsuga macrocarpa cf.	douglas fir
Quercus sp.	oak
Rumex/ Polygonum sp.	knotweed/dock
Salvia sp.	sage
Sambucus	elderberry
Sesuvium sp.	sea-purslane
Scirpus sp.*	bulrush or tule
Vulpia/Festuca sp.	fescue grass

*Indicates plant type has known ethnographic use in basketry or other perishable technology production

A majority of the charred seeds and wood pieces likely represent plants people ate, used for medicinal purposes, or burned for fuel. However, three plant types identified were used in the production of baskets or other woven products by Southern California tribes. These include seeds from the sedge family, charcoal from willow (or poplar), and seeds from bulrush or tule (Table 7-3).

Table 7-3. Paleobotanical Basketry Plants from Tashlipun

Plant	Levels Present	Count
sedge family	11	1
willow/poplar	2;3; 7; 9; 11	24
bulrush/tule	7;9;11	5
Total		31

These plants also served other important purposes in daily tasks not associated with basketry. Willow is used to make a wide variety of objects, from house frameworks

to shredded bark skirts. The fact that all possible fragments of willow or poplar at the site were charred suggests that this material was likely used as fuel in hearths in these archaeological contexts.

Tule and bulrush are known to be part of the sedge family and each had a wide variety of uses. The Chumash commonly used tule as house thatching material, as well as for mats, partitions, canoes, and many other objects (Timbrook 2007). There is some debate regarding the use of tule in the making baskets. Many groups denied using tule for basketry in talking with Harrington, however, many examples of tule twined basketry have been identified in the dry caves of the Chumash interior (Timbrook 2008:263). Timbrook suggests that this disparity may have resulted from the fact that many of Harrington's informants were from coastal Chumash populations or that this type of basket had gone out of style prior to this time (Timbrook 2008:263). There is no ethnographic evidence that these plants were exposed to heat for the purpose of processing basketry materials. However, Maria Solares indicated that the ashes from burned tule pith were used to help the cut from umbilical cord removal heal more quickly on infants (Timbrook 2008:266). The rhizomes and seeds of sedges and tule are known to have been consumed in moderation by some groups (Timbrook 2008; Latta 1977). The seeds identified in this assemblage more likely reflect evidence that tule was used on site for any number of purposes, including house thatching or mat weaving, or that they may have been burned for medicinal or food purposes.

Like willow, the evidence of sedge and tule in the paleobotanical sample indicates that people had access to the plants at the village and could have used unpreserved materials to produce baskets. However, the charred form they were observed in does not

confirm that they were harvested on site or that they were used specifically to make baskets.

Bernard (2008) notes that paleobotanical evidence indicates the site was likely occupied for most, if not all, of the year. This is evidenced by plant taxa that become available between late spring and into fall, and that many of the plant types observed are known have been stored for consumption during the winter (2008:257). With a year round, or nearly year round occupation, these plants would have been available for harvest while people were occupying the place, and *Tashlipun* villagers could have harvested plants on site.

Microwear Analysis Results

A microwear analysis of the unmodified flakes in the Tashlipun lithic assemblage identified 11 utilized flakes. Five flakes came from unit B1, two from unit A1, and one each from units A2, 65N/10W, 80N/4W, and 80N/5W. Lithic materials used consisted almost exclusively of Temblor chert, with two unidentified chert flakes and one fused shale utilized flake observed as well. Most of the flakes appear to be relatively small, generally less than 1.5 cm in length, while a few flakes were 2 to 3 cm in length. A summary of the analysis results is presented in Table 7-4.

Five flakes appear to have been used in some type of longitudinal cutting task and five exhibit usewear indicative of lateral scraping tasks. One flake, 1419.02, was used in both cutting and scraping tasks. Due to the magnification range of the microscope used in this analysis, the type of material worked could be confidently identified to hardness level in most cases. In some instances, it was possible to make tentative inferences about more specific material types. Occasionally, the usewear was not diagnostic enough to allow a

confident determination of material worked to any level. Evidence of possible worked materials identified included bone, plant, and meat or hide. The results of this analysis suggest that one flake from *Tashlipun* can be interpreted to have been used to process plants in a manner consistent with juncus coiled basketry production.

Table 7-4. Microwear Analysis Results for Tashlipun

Flake ID (CA-KER-188H-)		169	414	483	671	887.01	941.01	1120.01	1414.01	1419.01	1419.02	1447.01
Microflake Characteristics	**Scalar Flakes**	•	--	•	--	•	•	•	•	•	•	•
	Triangular Flakes	--	--	--	--	--	--	•	--	--	--	--
	Trapezoidal Flakes	--	--	--	•	•	--	•	--	--	--	--
	Step Terminations	--	•	--	•	•	•	•	•	--	--	--
	Feather terminations	•	--	•	--	•	•	•	•	•	•	•
Directionality	**One sided wear**	--	•	--	--	--	•	•	--	•	--	•
	Two sided wear	•	--	•	•	•	--	--	•	--	•	--
	Perpendicular striation	•	--	--	--	--	--	--	--	--	--	--
	Parallel striation	•	--	--	--	--	--	--	--	--	--	--
Abrasion	**Heavy**	--	--	--	•	--	--	•	--	--	--	--
	Fine	--	--	--	--	•	•	--	--	--	•	--
Polish/ Gloss	**Polish**	--	--	--	--	--	--	--	•	--	•	--
	Gloss	--	--	--	--	--	--	--	--	--	--	--
Interpretation	**Action**	Cutting	Scraping	Cutting	Cutting	Cutting	Scraping	Scraping	Cutting	Scraping	Cutting Scraping	Scraping
	Material	Hard (bone)	Hard	Medium (plant)	Soft	Hard	Medium (plant)	Hard (possibly bone)	Medium/Hard	Undetermined	Soft (meat or hide)	Hard

• Present -- Absent

Flake 941.01 is a primary flake removed from a slat of Temblor chert, recovered from unit A1 at a depth of 60-70 cm below ground surface (Figure 7-39). This flake exhibits one utilized margin with wear restricted almost completely to the right ventral face of the object (Figure 7-40). The wear extends approximately 11mm along the top half of a 21mm long margin. The margin is predominantly straight though irregular, with one concave section closer to the distal end of the usewear. The microflaking along the right ventral margin consists of contiguous scalar and irregular shaped microflakes with both feather and step terminations. There is a layer of shallow scalar feather termination microflakes present, overlaid by a later set of shorter and slightly deeper scalar and irregular shaped microflakes which exhibit both step and feather terminations (Figure 7-41). There is some evidence of fine abrasion, particularly close to the proximal end of the flake which suggests extended use on a firm material. One fresh break, identified by the lighter color and irregular shape, is visible on the left dorsal surface but this does not appear to be from use.

Figure 7-39. Flake 941.01 from Tashlipun, ventral surface.

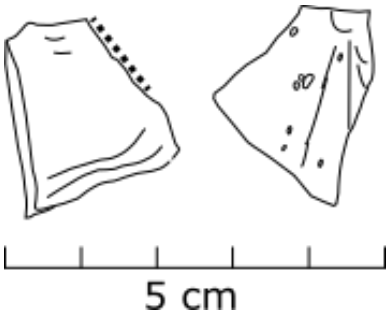

Figure 7-40 Location of usewear observed on Flake 941.01.
(Usewear identified by dotted line on illustration)

Figure 7-41. Flake 941.01 from Tashlipun, micrograph of proximal end of right ventral surface (60x). Shallow scalar feather termination microflakes overlaid by shorter and deeper scalar and irregular shaped microflakes with step and feather terminations. Edge rounding is also visible.

The fact that usewear is present on a single surface suggests that it was used to scrape the worked material. The microflake shapes and sizes are consistent with scraping a material of medium hardness. The fine abrasion and layering of microflakes suggests that the flake may have been used for an extended period or on different materials. This

piece was almost certainly used for scraping plant material, with the most recent layer of wear appearing similar to that produced from juncus and yucca scraping.

Additional Artifactual Evidence

The excavations at Tashlipun revealed additional artifacts associated with basket production. Four worked bone artifacts were recovered form CA-KER-188H, two each from the upper and lower cultural stratum. All of the worked bone artifacts are fragmentary and made from large mammal bones, most likely deer. Though all four exhibit polished surfaces and some rounded or pointed ends, Bernard suggests that only one of the four items is complete enough and equipped with diagnostic features to be considered an awl or hairpin fragment (Bernard 2008: 283-4).

Asphaltum and tarring pebbles were also observed in the assemblage collected from Tashlipun. Tarring pebbles are small rounded rocks used to coat the inner surfaces of basketry with asphaltum to fill in holes and created water tight containers. Though they have been noted to be used on other materials, these tarring pebbles are typically associated with the final stages of basketry production, ether in the making of water bottles or trays (Brown and Vellanoweth 2014). Bernard notes that there do not appear to be any temporal trends associated with asphaltum fragments, however, there appears to be a higher number of tarring pebbles coated in asphaltum present in the upper levels of the assemblage (Bernard 2008:233). Nearly 750 asphaltum pieces were recovered from the site. A total of 13 tarring pebbles were recovered from *Tashlipun*, 10 from between 0 to 40 cm below ground surface, and three from 70-80 cm below ground surface.

One steatite bowl rim fragment was recovered from a depth of 90 to 100 cm below ground surface. Though this bowls had many uses, the presence of this artifact

indicates a vessel was present on site that could have been used to hold water that was needed to moisten weaving strands in the coiling process.

Harrington noted that Pismo Clam (*Tivela stultorum*) was used to process juncus by the Coastal Chumash to process juncus (Hudson and Blackburn 1987). Approximately 13 *Tivela* shell beads were identified and two pieces of unmodified *Tivela* were observed in the assemblage. However, no mention was made of modified shell like that used for scraping juncus in Bernard's dissertation or in the artifact inventory from the excavation.

Finally, no Chumash structures were identified in Bernard's excavations (Bernard 2008). Additionally, no rock shelters were observed in close proximity to CA-KER-188H. Although structures likely existed at the location at one point, the lack of archaeological evidence precludes this location as being considered to have features used in basketry plant storage.

Summary of Evidence for Basketry Production at Tashlipun

The model predicted that weaving and water proofing basketry would be most likely to occur at the village of *Tashlipun*, and that this place could have also served as a harvesting locale in months that sumac, willow, and juncus were available but not in their prime state for harvest. A review of basketry production evidence at Tashlipun suggests that people living in the village had access to basketry plant materials and occupied the site at times when these plants would have been available for harvest. However, the paleobotanical results provided no indication of common Chumash basketry plants such as juncus or deer grass were used on site. The basketry plants identified -- sedge, tule/bulrush, and willow -- were observed in forms that are indicative of alternative uses, namely for medicine, food, or fuel. This suggests that *Tashlipun* was not a major

harvesting locale. Processing tools are equally scarce, with only a single utilized flake present that exhibits usewear consistent with plant processing like that of working juncus for basket production. The strongest evidence for basketry production at the site suggests later stages of manufacture. At least one bone awl and 13 tarring pebbles were recovered from the site, along with over 700 asphaltum fragments.

Pond (CA-KER-1635)

Site CA-KER-1635 exhibited a wide array of evidence to indicate it could have been a location used in the production of baskets. Below are the results of the basketry production analysis for the Pond site.

Contemporary Plant Communities

As discussed in the previous chapter, this site is located in a foothill setting, just east and upslope from of a seasonal sag pond. The environment is a mixture of grasslands and riparian habitats which provide a wide variety of plants that people might have used. Though this location has been impacted by ranching, the Wind Wolves Preserve has been working to rehabilitate the environment to allow the native species to thrive. In July 2016 plants present at the site include nettle (*Utrica dioica*), broadleaf plantain (*Plantago major*), redstem filaree (*Erodium cicutarium*), baltic rush (*Juncus balticus*), willow (*Salix* sp.), juniper (*Juniperus* sp.), thistle (*Cirisium* sp.), borage (*Borago officinalis*), docs or sorrels (*Rumex* sp.), rabbitbrush (*Ericameria* sp.), clover (*Melilotus* sp.), and narrow leaf milkweed (*Asclepias fascicularis*) (Julienne Bernard, personal communication 2016). Modern plant distribution does not likely reflect the exact plants that were present in the area in the past, but the presence of basketry plants such as juncus and willow in

contemporary settings indicate that it is more likely that they could have grown there in the past.

Paleobotanical Results

As discussed in the previous chapter, paleobotanical samples were taken from CA-KER-1635 to establish the uses of plants at the site. Six samples from one unit, making up 6 liters of soil were analyzed (Gill 2012a:6). A total of 22 plants were identified through analysis to the level of family, genus, or species (Table 7-5).

Table 7-5. Plants Identified in Paleobotanical Samples from Pond

Scientific Name	Common Name
Marah sp.	wild cucumber
Juniperus sp.	juniper
Quercus sp.	oak
Amaranthus sp.	amaranth
Calamdrinia sp.	red maids
Chenopodium sp.	goosefoot
Claytonia sp.	miner's lettuce
Hordeum sp.	barley
Hypericum sp.	St. John's wort
Juncus sp.*	Indian rush
Lepidium sp.	peppergrass
Papaver sp.	fire poppy
Plantago sp.	plantain
Potamogeton sp.	pondweed
Salvia sp.	sage, chia
Trifolium sp.	clover
Typha sp.	cattail
Asteraceae	sunflower family
Chenopodiaceae	goosefoot family
Fabaceae	bean family
Poaceae	grass family
Solanaceae	nightshade family

*Indicates plant type has known ethnographic use in basketry or perishable technology production

Nearly all of these seeds and charcoal fragments represent plants that would have been consumed, used for medicine, or burned for fuel. The only plant which has been

documented in basket production observed at this site is juncus (Table 7-5). As discussed in the basketry chapter (Chapter 3), the various species of juncus were used in different ways for the weaving of twined and coiled basketry. The split stems of *Juncus textilis* would be used as the weaving strands in coiled basketry production. *Juncus acutus* would be used whole for twined basketry, and whole strands of *Juncus balticus* were often used as the foundation in coiled basketry production. It was the shoots used to weave baskets, not charred seeds like those identified in the paleobotanical analysis (Table 7-6). Juncus seeds are also reported as having been consumed by some groups such as the Owens Valley Paiute, but this was not described as an important food item (Gilll 2012a:4).

Table 7-6. Paleobotanical Basketry Plants from Pond

Plant	Levels Present	Count
Juncus sp.	10; 12; 14	15

However, ethnographic information from Chumash informants indicate that *Juncus textilis* was occasionally subjected to a form of heat treatment in the process of preparing strands for weaving (Timbrook 2008: 125). In order to tan the juncus to the golden color seen in many baskets, shoots would be run through the warm ashes of an old fire. In this way, it is possible that any seeds still in the husks at the end of the stalk could have been charred. These 15 charred juncus seeds provide the first tangible evidence of basketry production at the site, suggesting early stage production activities.

In her analysis, Gill provides blooming/ripening period data for each of the plants identified in the site as a way to infer seasonality. The heavy reliance on small seeds that ripen in spring and summer suggest the site was occupied at these times, most predominantly between March and September (Gill 2012a:7-8). Juncus can be harvested at any point in the year (USDA 2003a) but some sources indicate that mature plants

exhibit a deeper red base color and may have a larger or longer size which would be desirable for weaving strands (Farmer 2012). Juncus generally matures between June and September, when people appear to have been using the site most heavily (Gill 2012a:8).

Microwear Analysis Results

The utilized flake assemblage from Pond contained 10 artifacts displaying a relatively high degree of diversity. Six flakes were recovered from TP1, three form TP2, and 1 from the boreholes. Lithic materials consisted of five unidentified chert flakes, two Temblor chert flakes, and one Monterey chert, one quartzite, and one andesite flake. One artifact, Flake ID number 94.01, may also have been utilized but was not analyzed under the microscope. For this analysis, the artifact is considered a unutilized flake. Most of the flakes appear to be relatively small, generally less than 1.5 cm in length. A summary of the analysis results is presented in Table 7-7.

Of the 10 utilized flakes identified, six flakes appear to have been used specifically for scraping, two exclusively for cutting, and two flakes appear to have been used in both cutting and scraping tasks. The limited range of the microscope used in this analysis, up to 135x magnification, places some restrictions on the confidence of interpreting worked materials. However, worked materials that were tentatively identified included bone or antler, soft plant, and wood. Undetermined hard and medium materials were also observed. This analysis suggests that 3 flakes could have been used to process plants for basketry (58.17, 110.01, and 182.01), with one flake, 182.01, exhibiting the most likely possibility of use in coiled basketry production.

Table 7-7. Microwear Analysis Results for Pond

Flake ID (CA-KER-1635-)		6.05	6.06	11.07	15.03	58.17	74.01	94.01	110.01	170	182.01
Microflake Characteristics	**Scalar Flakes**	--	•	•	•	•	•	•	•	•	•
	Triangular Flakes	--	--	--	--	--	--	--	--	--	--
	Trapezoidal Flakes	--	•	--	--	•	•	--	--	--	--
	Step Terminations	•	•	•	--	•	•	•	--	--	•
	Feather terminations	--	•	--	•	•	•	•	•	•	•
Directionality	**One sided wear**	•	--	•	•	--	--	--	•	--	•
	Two sided wear	--	•	--	--	•	•	•	--	•	--
	Perpendicular striation	--	--	--	--	--	--	--	--	--	--
	Parallel striation	--	--	--	--	--	--	--	--	--	--
Abrasion	**Heavy**	--	•	--	--	--	--	•	--	--	--
	Fine	•	--	--	--	•	•	--	--	--	•
Polish/ Gloss	**Polish**	--	--	--	--	--	--	--	--	--	--
	Gloss	--	--	--	--	--	--	--	--	--	--
Interpretation	**Action**	Scraping	Cutting	Scraping	Scraping	Scraping	Cutting Scraping	Cutting	Scraping	Cutting Scraping	Scraping
	Material	Hard	Medium (wood)	Hard (bone/antler)	Undetermined	Medium (wood?)	Medium (wood?)	Hard	Medium (plant)	Medium	Medium (plant)

• Present – Absent

Flake 58.17 is a large tertiary flake from an unidentified chert material (Figure 7-42). This flake appears to have been fire affected, evidenced by a potlid, and has been broken along one margin, also potentially associated with heat exposure. The flake was recovered from Test Pit 1 at a depth between 90-100 cm below surface. Usewear is visible on both faces of the utilized margin (Figure 7-43).

The distal half of the ventral right margin of this flake exhibits contiguous short, deep, scalar microflakes with feather terminations, interspersed with a few irregular shaped microflakes and one trapezoidal shaped microflake, all with feathered terminations (Figure 7-44). This usewear extends approximately 17.3 mm along the length of the flake. On the opposing dorsal left margin, one trapezoidal scar and some possible edge rounding are observed (Figure 7-45). This wear is present at the distal end of the flake and extends approximately 8 mm along the margin. The edge rounding may be due to taphonomic processes of being buried in sandy deposits, however, edge rounding is also associated with extended use length and certain worked materials, generally soft or medium hardness.

Figure 7-42. Flake 58.17 from Pond, ventral surface

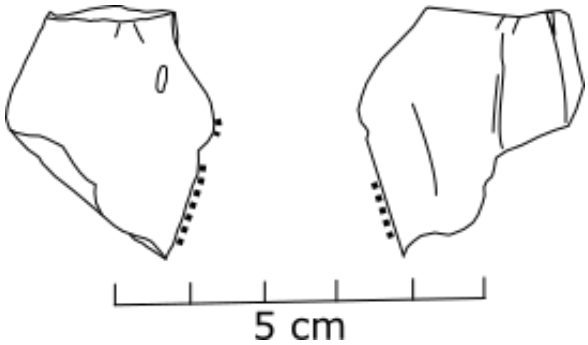

Figure 7-43. Sketch of flake 58.17 indicating location of usewear. (Usewear identified by dotted line on illustration)

Figure 7-44. Flake 58.17, micrograph of distal end of right ventral surface (45x). Contiguous short, deep, scalar microflakes with feather terminations, few irregular shaped and one trapezoidal shaped microflake with feathered terminations.

Figure 7-45. Flake 58.17, micrograph of distal end of left dorsal surface (45x). One trapezoidal scar and some possible edge rounding.

The fact that usewear is predominantly present on a single surface suggests that it was used in a unidirectional, lateral scraping motion on the material worked. The shape and size of the microflakes on the right ventral margin are generally consistent with scraping a material of medium hardness. The exception is the step termination trapezoidal flake on the dorsal margin; however, that wear does not indicated continued, regular use of the flake on hard materials. The fine abrasion and slight rounding suggests that the flake may have been used for an extended period or on different materials. This flake is interpreted as having been used to scrape medium hard materials. Plants generally fall into that category. This results indicates the flake may have been used to process plant material in a manner consistent with production of material goods rather than food goods as suggested by Miller (2014). The presence of contiguous microflakes and a few trapezoidal microflakes indicate that the flake might have been used to scrape wood but the wear is not characteristic enough to be able to be assigned to a more specific worked material than that of medium hardness. Working juncus in the experimental program for this project also resulted in some trapezoidal microflakes.

Flake 110.01 is a broken tertiary flake which may have been a general biface reduction flake, comprised of unidentified chert (Figure 7-46). The flake was recovered from Test Pit 2 at a depth of 90 to 100 cm below ground surface. Flake 110.01 shows signs of edge damage exclusively on the proximal left dorsal margin (Figure 7-47). This flake exhibits a small area of about 7 contiguous scalar, feathered termination microflakes, measuring approximately 7 mm in length along the margin (Figure 7-48).

Figure 7-46. Flake 110.01 from Pond, dorsal surface

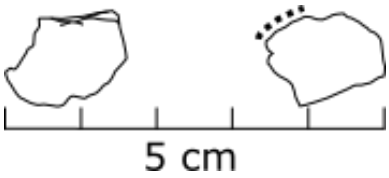

Figure 7-47. Sketch of flake 110.01 indicating location of usewear. (Usewear identified by dotted line on illustration)

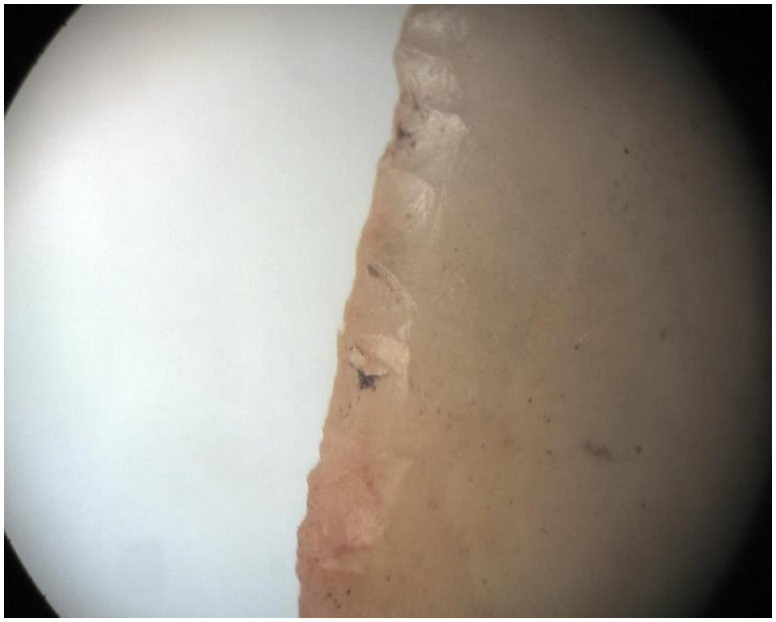

Figure 7-48. Flake 110.01 from Pond, micrograph of proximal end of left dorsal surface (45x). Contiguous scalar, feathered termination microflakes.

The presence of microwear on a single face suggests that this flake was likely used for scraping. The contiguous, overlapping scalar microflakes are indicative of working medium hard materials and looks similar to yucca and juncus scraping usewear. The terminations, while feathered, appear to have a small step in some instances, suggesting that the worked material may have been harder than juncus or yucca. It does not appear likely that this flake was used on softer materials because of the pronounced, deep microflakes and the lack of edge rounding seen in hide and meat processing. It is equally unlikely that the flake was used on harder material due to the lack of abrasion and edge crushing.

182.01 is a small tertiary flake comprised of Monterey Chert (Figure 7-49). This flake was recovered from Test Pit 2 between 0 and 80 cm below ground surface. This flake exhibits usewear exclusively on the left ventral margin, along the entire length of the flake, approximately 7.8 mm (Figure 7-50). This wear consists of intermixed scalar and irregular shaped microflakes with deep bulbs and predominantly feathered terminations. The microflakes are contiguous across the entire margin (Figure 7-51). No wear was observed along the right dorsal margin on the opposing side of the flake edge. The utilized edge exhibited a slightly concave form which may have been produced from use. The margin also exhibits some evidence of fine abrasion, producing and edge rounding effect, which may suggest that the flake was used for an extended period of time or on soft material. If this abrasion was heavier or associated with different types of microflakes it might suggest that the worked material was hard. However, the fine abrasion a feathered termination flakes suggests the material was somewhat pliable and likely of medium hardness.

Figure 7-49. Flake 182.01 from Pond, dorsal surface

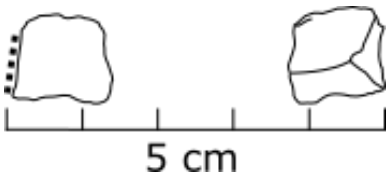

Figure 7-50. Sketch of flake 182.01 indicating location of usewear. (Usewear identified by dotted line on illustration)

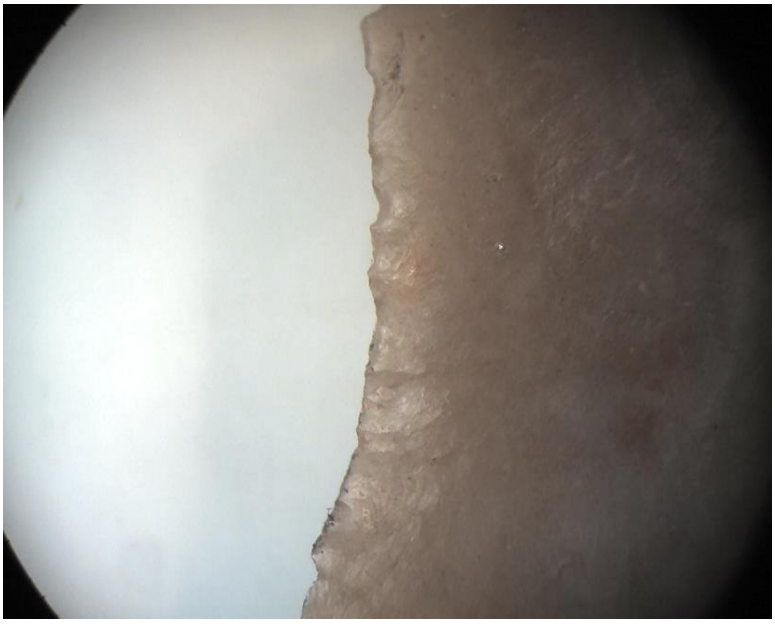

Figure 7-51. Flake 182.01 from Pond, micrograph of end of left ventral surface (30x). Contiguous scalar and irregular shaped microflakes with feathered terminations.

The presence of usewear along a single face of a single margin suggests that the flakes was used unidirectionally on only one side. This is consistent with a scraping motion. The microwear suggests that the tool was used on medium hard material for an unknown period of time. This wear is similar to the type of wear was observed on the chert flake used to scrape juncus in the usewear experiments in this study.

Additional Artifactual Evidence

The assemblage excavated from Pond identified no worked bone artifacts that could be inferred to be used in weaving coiled basketry. Additionally, although two weighty *Tivela* fragments were identified in the assemblage, the faunal analyst noted no evidence of wear on these pieces (Armstrong 2013a). This suggest that the material was likely not used to process juncus on the site. It should also be noted that the presence of Pismo clam was a common item from archaeological sites dating to the first part of the 20th century in the oilfields northwest of the site (Armstrong 2013a). This could indicate a historic component of the site in this case.

Although additional artifacts associated with weaving or processing are not present in the assemblage, eight tarring pebbles were noted in the collection in the electronic database. These pebbles were all recovered from Test Pit 1 at a depth of 80-90 cm below ground surface. However, a more detailed analysis of groundstone and some miscellaneous stone artifacts from the assemblage clarified that at least one of the artifacts collected as a tarring pebble was a quartzite hammer stone. Additionally, the analysis only discussed one of the tarring pebbles. It is not clear whether the remaining 6 objects collected as tarring pebbles were determined not to be artifacts, if they are tarring pebbles, or if the count of 8 was an error (Reeves 2012). A stone bowl fragment was also

recovered from this level (Robinson et al. 2008:21). However, in the detailed groundstone analysis of the site, this object was referred to as a portable stone mortar (Reeves 2012). The stone bowl could have been used to hold water needed to keep weaving strands moist in the weaving process. However, it should be noted that stone bowls have a wide range of practical uses and they cannot be directly attributed to basketry production.

Lastly, the rock shelters at the site should be considered in this discussion. Although these are natural features in the landscape, they may have been used by women to store freshly harvested and processed basketry plants. The presence of these natural storage features indicate the site has potential as a storage locale, despite not exhibiting evidence of Chumash structural features.

Summary of Evidence for Basketry Production at Pond

The model outlined in Chapter 4 predicted that seasonal villages like Pond would likely have been locales for harvesting plants, storing plants, and processing them for use in basketry. A review of contemporary plant communities and the paleobotanical remains from Pond indicate that juncus was present on site and that it was used by people in the past. Further, the paleobotanical data indicate that people likely inhabited the site between spring and summer, the time when juncus reaches maturity and exhibits what some say are the most desirable characteristics for weaving. The ethnobotanical data suggest Pond may have been a harvesting locale. The charred juncus seeds may also represent tanning activities, used to turn the juncus a desired golden color prior to it being cut and split.

The utilized flake assemblage exhibited three flakes that have usewear consistent with wear that develops from scraping juncus and yucca materials in preparation for use in basketry, specifically from scraping the soft interior from the stiff exterior stalk. The presence of natural rock shelters at the site provides evidence that place has potential to be a storage locale, although it is difficult to imagine how to test the use of a rock shelter. The use as a storage locale is strengthened with the evidence that plants were possibly harvested here or nearby and that they were likely processed on site. This suggests that between these two activities, harvested juncus was likely dried and stored on site until it was ready to be processed.

The evidence for weaving and finish baskets at the site is more ephemeral. A stone bowl or portable mortar fragment was observed, however, this cannot be directly ascribed to basket production. The only confirmed diagnostic artifact associated with later stage basketry production is a single taring pebble. Though eight are noted in the catalog, the detailed analysis by Reeves (2012) suggests that they may not all be tarring pebbles. This review suggests that CA-KER-1635 represents a potential harvesting locale and an early plant material processing locale for plants in the first stages of basket production.

Three Springs (CA-KER-3388)

Site CA-KER-3388 exhibited a moderate assemblage, larger than the Pond assemblage, in part because more soil was excavated, but also due to the density of the prehistoric occupation. The larger assemblage provides a more representative sample of the activities people participated in at the site in the past.

Contemporary Plant Communities

CA-KER-3388 is located in a similar environment to CA-KER-1635, although a few hundred feet lower in elevation and further south into the foothills. The site is situated in hilly grassland habitat with riparian spring environments interspersed. This location exhibits a notable degree of historical and contemporary impact, evidence by the water tanks, fences, and pipes located in the vicinity. During a visit in July 2016, I surveyed the site and the immediate vicinity to identify any plants that could have been used for basketry production. Basketry plants observed in the area include juncus, bulrush, and willow which grow in the springs located in the wash at the site. The presence of these plants today suggests that they may have grown there in the past when people occupied the site.

Paleobotanical Results

As discussed in the previous chapter, paleobotanical samples were taken from CA-KER-3388 to establish the uses of plants at the site. Ten samples from TP 1 were analyzed and 8 samples were analyzed from TP 2 (Gill 2012b). A total of 24 plants were identified in the samples to the level of family, genus, or species (Table 7-8).

Table 7-8. Plants Identified in Paleobotanical Samples from Three Springs

Scientific Name	Common Name
Amaranthus sp.	amaranth
Asteraceae	sunflower family possibly sagebrush
Calandrinia ciliate	red maids
Chenopodium sp.	goosefoot
Claytonia sp.	miner's lettuce
Eleocharis sp.	needle spike rush
Fabaceae	legume
Juncus sp.*	Indian rush
Hemizonia sp.	tarweed
Hypericum sp.	St. John’s wort
Lepidium sp.	peppergrass
Marah macrocarpus	wild cucumber

Table 7-8. Plants Identified in Paleobotanical Samples from Three Springs

Scientific Name	Common Name
Mentzelia sp.	blazing star
Papveraceae	poppy family
Papaver sp.	fire poppy
Phacelia sp.	phacelia
Plantago sp.	plantain
Poaceae	grass family
Potamogeton sp.	pondweed
Quercus sp.	oak
Salvia sp.	sage, chia
Silene sp.	Indian pink
Trifolium sp.	clover
T. depauperatum	cowbag clover

*Indicates plant type has known ethnographic use in basketry or perishable technology production

These charred seeds and wood fragments most likely represent plants people ate, used for medicinal purposes, or burned for fuel. Only one species identified in the analysis, *Juncus* sp., is known to have been used in the production of basketry or other woven products by Southern California groups (Table 7-9).

Table 7-9. Paleobotanical Basketry Plants from Three Springs

Plant	Levels Present	Count
Juncus sp.	11; 13	2

As discussed in the previous section and detailed in Chapter 3, various juncus species had different uses for basketry production and were also occasionally consumed. Identifying charred juncus seeds does not necessarily suggest that they were burned in the process of food preparation, but that they could have been burned in the process of turning the stalks a tan color for use in weaving (Hudson and Blackburn 1987). This process could result in charred seeds if they were not removed from the stalk prior to exposure to hot coals. Ethnographic data collected by Harrington does not provide the level of detail needed to determine if the plants were trimmed prior to being run through

the ash. However, it does present one possible reason why charred juncus seeds might be present in the archaeological assemblage. The ratio of juncus observed at this site (2 pieces in 18 liters of soil) is much smaller than the juncus observed at Pond (15 pieces in 6 liters of soil). This may indicate that the process was not used here often or that this plant was not used for food very heavily. Nevertheless, the presence of juncus in the paleobotanical samples and at the site today suggests that people living at Three Springs had access to the plants and used them to some degree.

Seasonality data compiled by Gill (2012b) suggests that the site was likely occupied between February and September, with the greatest overlap of plant resources observed at the site available between March and August. Juncus reaches maturity between June and September, when people would have been occupying the site.

Microwear Analysis Results

Three Springs exhibits the smallest assortment of utilized flakes out of the four sites analyzed. Five utilized flakes were identified. Three flakes were recovered from TP3 and one each came from TP1 and TP2. Lithic materials consisted of two Temblor chert flakes, one Franciscan chert flake, one unidentified chert flake, and one obsidian flake. Three of the flakes are between 1.8 and 1.9 cm in length, while one flake is only 1.4 cm in length and another is 3 cm in length. A summary of the analysis results is presented in Table 7-10.

As the table indicates, there is a remarkable amount of similarity among the utilized flakes identified from Three Springs. Four of the five flakes were likely used in scraping materials of medium hardness. The microscope used in this analysis had limited range, which places some restrictions on the confidence of interpreting worked materials.

General hardness or softness can be inferred with greater confidence than actual material type. However, certain patterns can be used to make tentative interpretations of worked material associated with particular flakes. It appears that one flake was likely used to scrape wood, two were used to scrape some form of plant material, one was used to scrape an undetermined hard material, and one was used for cutting, possibly ochre. Because some woody plants are known to have been used in coiled basketry production, all four of the flakes identified as scraping medium or hard materials will be discussed below.

Table 7-10. Microwear Analysis Results for Three Springs

Flake ID (CA-KER-3388-)		17.01	178.01	257.01	243.02	309.01
Microflake Characteristics	**Scalar Flakes**	•	•	•	--	•
	Triangular Flakes	--	--	--	--	--
	Trapezoidal Flakes	•	--	--	•	--
	Step Terminations	•	--	--	•	•
	Feather terminations	•	•	•	--	•
Directionality	**One sided wear**	•	•	•	--	•
	Two sided wear	--	--	--	•	--
	Perpendicular striation	--	--	--	--	--
	Parallel striation	--	--	--	--	--
Abrasion	**Heavy**	--	--	--	--	--
	Fine	--	--	•	--	--
Polish/ Gloss	**Polish**	•	--	--	--	--
	Gloss	--	--	--	--	--
Interpretation	**Action**	Scraping	Scraping	Scraping	Cutting	Scraping
	Material	Medium (wood)	Medium (plant)	Medium (plant)	Possibly Ochre	Hard

• Present – Absent

NA-CA-KER-3388-17.1 is a small Franciscan chert alternate flake (Figure 7-52). The artifact was recovered from Test Pit 1 between 30 and 40 cm below ground surface.

This flake exhibits usewear predominantly on a single face of a single margin (Figure 7-53). Shallow contiguous microflakes are present on the ventral surface of the flake. This wear extends approximately 12 mm in length along the margin. Microflake types include small scalar and trapezoidal, with some larger hinge termination flakes. Microflakes with feathered termination overlay short steep, wide microflakes at the edge of use (Figure 7-54). This flake exhibits some possible polish or gloss on the dorsal surface opposite of the utilized edge.

Figure 7-52. Flake 17.01 from Three Springs, ventral surface

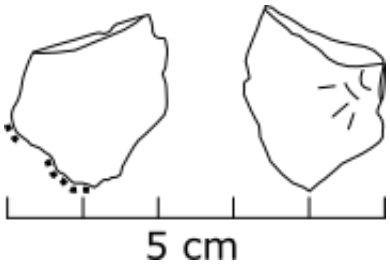

Figure 7-53. Sketch of flake 17.01 indicating location of usewear. (Usewear identified by dotted line on illustration)

Figure 7-54. Flake 17.01, micrograph of left ventral margin (30x). Shallow contiguous microflakes. Irregular and scalar shapes with feathered terminations.

The presence of microflakes on one face of a margin suggests a scraping use motion. Step fractures and trapezoidal microflakes suggest use on a harder material. Tringham and colleagues (1974) suggest that trapezoidal microflakes are associated with working wood.

CA-KER-3388-178.01 is an obsidian biface reduction flake recovered from Test Pit 2 at a depth of between 120-130 cm below ground surface (Figure 7-55). This item exhibits wear on a single face of a single margin (Figure 7-56). The right ventral margin has continuous, short, scalar microflakes overlaying some larger more irregular flake scars which cover about 6.2 mm of the flake margin. There is also some evidence of edge rounding through abrasion (Figure 7-57). No microflakes were observed on the opposing dorsal surface. The right dorsal and left ventral margin exhibits some short irregular flakes, crushing, and possible abrasion. These patterns suggest that the damage may have been from taphonomic processes.

The pattern of short, scalar, contiguous microflakes on a single face of a margin are similar to the wear produced from scraping juncus. However, there appears to be some irregularities with large flake scars which have pronounced, compressed, rings of percussion that may suggests scraping use on some other material or that the wear may have been caused by natural disturbances of trampling or jostling in the sand.

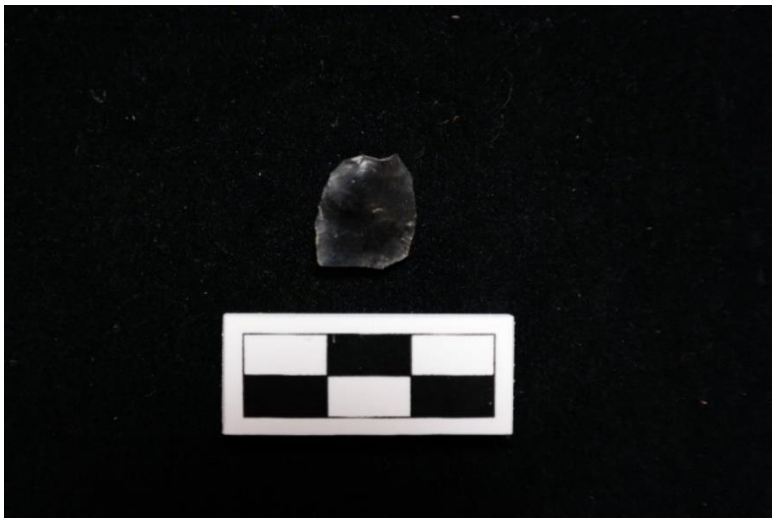

Figure 7-55. Flake 178.01 from Three Springs, ventral surface

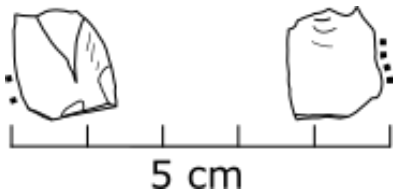

Figure 7-56. Sketch of flake 178.01 indicating location of usewear. (Usewear identified by dotted line on illustration)

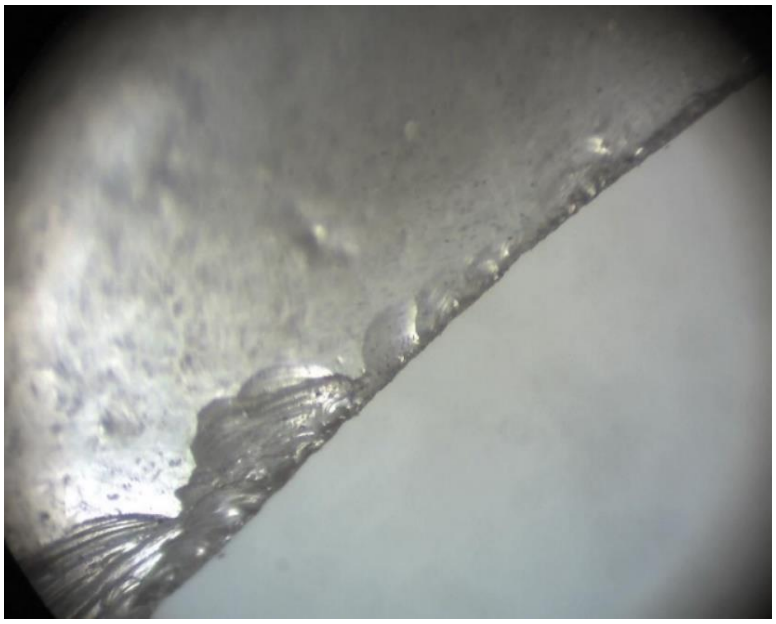

Figure 7-57. Flake 178.01, micrograph of right ventral margin (120x). Continuous, short, scalar microflakes overlaying larger irregular flake scars; rounding and abrasion on margin.

CA-KER-3388-257.01 is a heat treated Temblor chert flake fragment (Figure 7-58). This flake was recovered from Test Pit 3 between 30 and 40 cm below ground surface. Usewear is present on only the right margin of the dorsal surface, extending 12.9 mm along the margin (Figure 7-59). This wear consists of continuous scalar microflakes with feathered terminations (Figure 7-60). There are also some irregular shaped scalar microflakes interspersed. A fine abrasion is present along the utilized margin and some of the flake scars appear to have been abraded as well. This abrasion may be the result of extensive use or from taphonomic processes. The worn appearance of some of the microflake scars might be from deposition, however, the consistent abrasion along the margin suggests it is the result of use.

The feathered terminations and scalar shape of the microflakes, along with their continuous presence along only one face of one margin suggest it was used for scraping a

medium hard material. While the exact type of worked material cannot be determined at this time, the lack of step fractures and rounded edges suggests that this material was potentially a plant of similar hardness to juncus which produced similar usewear.

Figure 7-58. Flake 257.01 from Three Springs

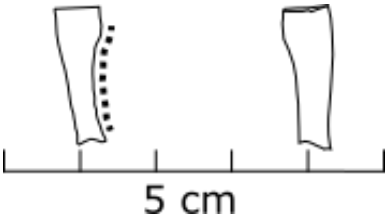

Figure 7-59. Sketch of flake 275.01 indicating location of usewear. (Usewear identified by dotted line on illustration)

Figure 7-60. Flake 275.01, micrograph of right dorsal margin (60x). Continuous scalar microflakes with feathered terminations; a few irregular flakes interspersed.

Flake CA-KER-3388-309.01 is a small undiagnostic tertiary flake of undetermined chert that may have come from a multidirectional core (Figure 7-61). The flake was recovered from Test Pit 3 between 110 and 120 cm below ground surface. This item displays edge damage on two margins (Figure 7-62). Along the right ventral surface of the flake there are contiguous scalar microflakes beneath stepped edges that extend over about 10.7 mm of the margin length (Figure 7-63). These microflakes are along the center of the flake which has an irregular straight shape with a concave curve at the top. There is also evidence of edge damage on the opposite surface of the same margin. This could indicate the piece was used for cutting, however, the edge damage is irregular and appears to be a result of natural processes rather than use on the opposing face.

On the distal end of the left ventral margin, three small scalar microflakes are also present (Figure 7-64). These micro flakes are larger, more shallow, and boxier than those on the right ventral margin and extend across only 2.9 mm of the flake margin.

Figure 7-61. Flake 309.01, dorsal surface

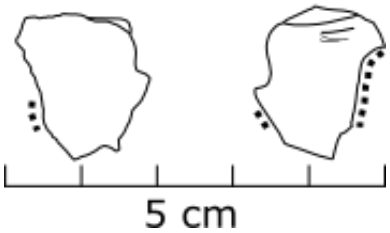

Figure 7-62. Sketch of flake 309.01 indicating location of usewear. (Usewear identified by dotted line on illustration)

Figure 7-63. Flake 309.01, micrograph of right ventral margin (24x). Contiguous, scalar microflakes beneath stepped edges.

Figure 7-64. Flake 309.01, micrograph of left ventral margin (60x). Three small scalar microflakes with feathered terminations.

This flake exhibits limited diagnostic characteristics which can be used to infer use. The presence of usewear on a single face, even though it is present on two different

margins, suggests that the flake was used for scraping tasks. Both areas of use exhibit relatively shallow, contiguous scalar microflakes. The right ventral face also exhibits some irregular shaped microflakes and step terminations suggesting it may have been used in multiple angles on a somewhat harder material. The left ventral surface exhibits a small set of shallow, scalar microflakes. These may have been produced from short term use on a number different materials. Unfortunately, the wear signatures on this flake are too vague to make an interpretation on worked material except to offer that it was likely of medium hardness. Materials of medium hardness could include plants such as acorns[2], fresh wood, or other vegetation.

Additional Artifactual Evidence

Three Springs exhibited limited evidence of additional artifacts associated with basketry production. A few fragments of asphaltum were identified below 50 cm at the site. As previously discussed, this material is known to have been used to make woven water bottles water tight and used to seal holes in parching trays. However, it is also known to have been used as an adhesive for many different items, including in hafting projectile points to wooden shafts. Two clam shell fragments were identified in the faunal assemblage but they could not be identified to species. Additionally, no evidence of intentional modification for use was observed on the shell (Armstrong 2013b). No tarring pebbles or awls were observed in the excavated CA-KER-3388 assemblage. However, four stone bowl fragments were identified. As stated previously, the evidence of stone bowls suggests that vessels were present that could have been used to hold water

[2] After an acorn shell is removed, there is a papery thin layer, similar to peanut skin, which must also be removed before the acorn can be ground in the process of acorn meal production. The skin can be peeled away with fingernails or removed using a tool such as a knife or flake.

needed to keep weaving strands moist. Finally, the presence of natural rock shelters at the site indicates the locale could have been used to store harvested or processed plant materials. Although, similar to the stone bowl fragments, it is difficult to make a direct connection of these features to basketry production.

Summary of Evidence for Basketry Production at Three Springs

Per the predictive model, seasonal villages like Three Springs are anticipated to have been used as basketry plant harvesting, storing, and processing locales. Three Springs exhibits a functioning riparian ecosystem around nearby springs, offering habitat for such basketry plants as juncus, tule, and willow. However, the macrobotanical analysis indicted only a very small amount of juncus used at the site. This suggests that although people had the ability to harvest and process plant materials used for weaving, it does not appear to be a prominent activity at the site.

There is also moderate evidence that people living at Three Springs engaged in middle stage processing of plants such as cutting stems, splitting stems, or cleaning them. Four of the five utilized flakes at the site provide usewear consistent with scraping medium hard materials which juncus processing falls into. The tools may have also been used to prepare or repair arrow shafts or other tools associated with these biface production activities occurring at the site.

Evidence for plant storage is circumstantial and difficult to prove. However, the presence of natural rock shelters at the site provides some indication that plants could have been stored here. The possibility of plant storage on site is strengthened by evidence for other complementary activities such as harvesting the plants or processing the plants.

Because both of these have potential to have occurred on site, it is more likely that plants were stored here at some point.

Additionally, the absence of weaving tools such as awls, or final stage production tools such as tarring pebbles, suggest that weaving and waterproofing baskets was not a major component of life at this site.

Cache Cave (CA-KER- 10419)

The cave site is distinct from the other sites considered in this thesis in many ways. Importantly here, it is the only site still currently being excavated. Due to the sensitive nature of the site and the ongoing work conducted there, the dataset is incomplete at the moment. However, large portions of the cave have been excavated and provide enough information which can be used to compare Cache Cave with other sites in the region.

Contemporary Plant Communities

Cache Cave is located in the high foothills at an approximate elevation of 2660 ft amsl, placing this site in proximity to vegetation communities distinct from the other three sites. This site is also situated near a creek which contains water nearly all year round, providing a lush riparian habitat. A wide variety of species grow in the creek adjacent to the cave and many others grow in the hilly chaparral and oak woodland environments around the entrance to the cave as well. A few members from the excavation team conducted an informal inventory of the surrounding vegetation and identified a wide variety of species, including cattail, juncus, salt grass, sedge-nutgrass, two sided tule, various grasses, moss, fireweed, wild celery, pepperweed, mountain sage, stinging nettles, mugwort, non-native thistle, black willow, bunch rye, narrow leaf

milkweed, non-native mustard, non-native filaree, tumbleweed/Russian thistle, sticky shrub, rabbit brush, rye, phacealeia, clover, mint, doveweed/euphorbia, cottonwood, elderberry, and buckwheat (Julienne Bernard, personal communication 2016). Plants identified at the site known to be used in basketry included a nice tall stand of juncus, sedges, tule, giant rye, and willow. This location had the tallest and widest juncus compared with the other sites examined. It should be noted that the area, though remote, has been subject to impacts from ranching indicated by the non-native species and the sporadic presence of cattle in the area in modern times. Although this has impacted the character of the vegetation community and introduced invasive and non-native plants, much of the environment remains pristine. Contemporary plants are an indication of what plants may have grown in the area in the distant past and through time.

Paleobotanical Results

The preservation of organic materials in Cache Cave extends from the artifacts to the natural plant remains as well. Both artifactual and paleobotanical materials from the cave are discussed in this section.

In his review of perishable artifacts excavated in 2012, Jolie observed that juncus was used for coiling foundation as was a type of bunch grass, possibly deer grass. Dark decorative elements appear to have possibly been weaved using devils claw or bracken fern but this assessment is tentative. Weaving or stitching materials for coiled basketry included juncus, sumac, and possibly willow. Tule was primarily used in twined basketry, along with some juncus, sumac, or other woody plant. Jolie observed that some cordage appears to be made of yucca, sinew, and possibly juniper bark and cotton (Jolie 2013).

In addition to the mentioned plants, large amounts of cane have been recovered from the cave. Daniel McArthur conducted an analysis of the cane objects from the site as part of his master's thesis. McArthur noted that cane was observed in large amounts in unmodified form, some was observed to have been pinched or slightly modified, and artifacts, such as an arrow fore shaft, made of cane was also observed (McArthur 2016). This plant has also been described ethnographically as a plant used in basketry (McArthur 2016; Timbrook 2008), however, Jolie did not specify this material in his observations.

Ultimately, these results can only be considered preliminary and should be evaluated with care. It is known that basketry plants such as juncus, bunchgrass, sumac, tule, and possibly willow were identified in the cave as part of complete, nearly complete, or fragmentary basketry. However, Jolie noted that none of the baskets appeared to be in the process of manufacture. Until a more complete analysis is available for the paleobotanical remains and the basketry assemblage, this summery can only indicate people in the region certainly used juncus, deer grass, tule, sumac and possibly willow to create basketry.

As discussed in Chapter 6, only a preliminary review of the paleobotanical data has been conducted. These early results did not discuss the presence or absence of basketry plant materials. The lack of a complete macrobotanical assessment makes it difficult to determine seasonality of site use, so it is unknown what times of year people were likely using the site in the past.

Microwear Analysis Results

The analysis of utilized flakes in the assemblage identified 12 unmodified flakes with observable usewear. In addition, flake CC-15-2996, which appeared potentially modified was included in this utilized flake analysis because it was difficult to determine if certain portions exhibited wear exclusively from use or from modification. This is the largest assemblage of utilized flakes from the four sites in the analysis. There was a variety of materials observed, including seven Temblor chert flakes, three fused shale flakes, two Franciscan chert flakes, one chalcedony flake, and one unidentified chert flake. A majority of the flakes are between 2 and 3 cm in length, with one flake measuring only 1.3 cm long and two measuring over 4 cm in length. One utilized flake was recovered from Cave 1, which has yet to be fully excavated, two were recovered from Cave 2, though there may be additional artifacts excavated in the summer of 2016 which have not yet been identified, and a majority of the utilized flakes appear to have come from Cave 3, the small cave which provides the clearest evidence of caching activities. Table 7-11 provides a summary of usewear observed on the utilized flake assemblage.

Table 7-11. Microwear Analysis Results for Cache Cave

Flake ID (CC-)		14-1322	14-1547	14-1653.1	15-1878	15-2010.01	15-2020	15-2279	15-2535.01	15-2570	15-2827	15-2996	15-3025	15-3059
Microflake Characteristics	**Scalar Flakes**	•	•	•	•	•	•	•	•	•	•	•	•	•
	Triangular Flakes	--	--	--	--	--	--	•	•	--	--	--	--	--
	Trapezoidal Flakes	--	--	--	•	--	•	--	•	--	--	○	•	•
	Step Terminations	--	--	--	•	--	•	•	•	--	--	○	•	•
	Feather terminations	•	•	•	•	•	•	•	•	•	○	•	--	•
Directionality	**One sided wear**	•	•	•	--	•	--	--	--	--	•	•	•	--
	Two sided wear	--	--	--	•	--	•	•	•	•	--	--	--	•
	Perpendicular striation	--	--	--	--	--	--	--	--	--	--	--	--	--
	Parallel striation	--	--	--	--	--	--	--	--	--	--	--	--	--
Abrasion	**Heavy**	•	•	•	--	--	•	--	--	--	--	•	•	--
	Fine	--	--		•	--	--	•	○	•	--	--	--	○
Polish /Gloss	**Polish**	•	○	○	--	--	--	○	--	--	--	--	--	--
	Gloss	--	--	--	--	--	--	--	--	--	○	--	--	--
Interpretation	**Action**	Scraping	Scraping	Scraping	Cutting Scraping Boring	Scraping	Cutting	Scraping	Cutting	Scraping	Scraping	Scraping	Scraping Graving	Cutting
	Material	Soft (hide)	Soft (hide)	Soft (hide)	Medium	Undeter-mined	Medium Hard (wood)	Hard Soft (meat on bone)	Medium (wood)	Soft (hide)	Undeter-mined	Hard	Hard	Medium Hard

• Present ○ May be Present – Absent

Because Cache Cave is compartmentalized into spatially distinct caves that appear to have been used by people in particular ways, it is worth discussing the types of utilized flakes observed in each cave. The only utilized flake to be recovered from Cave 1 exhibited wear indicative of working soft material, possibly hide or soft plants, in a scraping motion. Cave 2 yielded two flake tools that also suggest the working of soft materials. All of these fakes exhibit heavy edge rounding, one sided usewear, polish, and limited scalar microflakes. In the early stages of analysis, I had interpreted this edge rounding to be indicative of plant scraping (Hill 2015). However, the edge rounding produced from juncus or wood scraping appear to be rougher than the smooth finishes on these flake margins. The most likely worked materials include hide or soft plant matter. Cave 3 exhibits a much wider array of usewear signatures. Cutting, scraping, and boring tasks were observed and worked materials include soft, medium and hard objects such as hide, wood, or bone.

Of the 13 flakes examined, three exhibit wear patterns which suggest they may have been used to process juncus or other plant materials for use in basketry, based on experimental replicas and comparative literature: 15-1878, 15- 2827, and 15-2010.01. All three flakes were recovered from contexts in Cave 3.

Flake CC-15-1878 is a fused shale alternate flake recovered from Test Pit 11, context 020, level 1, southeast quadrant (Figure 7-65). The flake exhibits usewear on the right and left margin, as well as the distal dorsal ridge and the distal tip (Figure 7-66). The left ventral surface has irregular breakage and or step fracturing interspersed with scalar and trapezoidal microflakes concentrated in the center of the margin, the distal end, and scattered between. This wear is located along 22.5 mm of the flake margin. The right

ventral margin exhibits scattered concentrations of scalar microflakes near the center and near the distal end (Figure 7-67). The distal right ventral margin also exhibits a few trapezoidal microflakes. The dorsal surface exhibits slightly less edge wear though the dorsal ridge near the distal end exhibits scalar flake scars and what looks like abrasions and possible polish (Figure 7-68). Along both the right and left dorsal margins are very sparse scalar microflakes or undiagnostic edge damage, more present on the left dorsal margin than the right.

Figure 7-65. Flake 15-1878, ventral surface

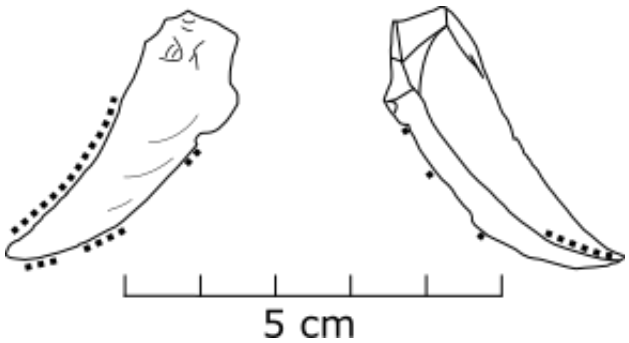

Figure 7-66. Sketch of flake 15-1878 indicating location of usewear. (Usewear identified by dotted line on illustration)

Figure 7-67. Flake 15-1878, micrograph of right ventral margin (37.5x). A cluster of scalar microflakes near the center of the margin.

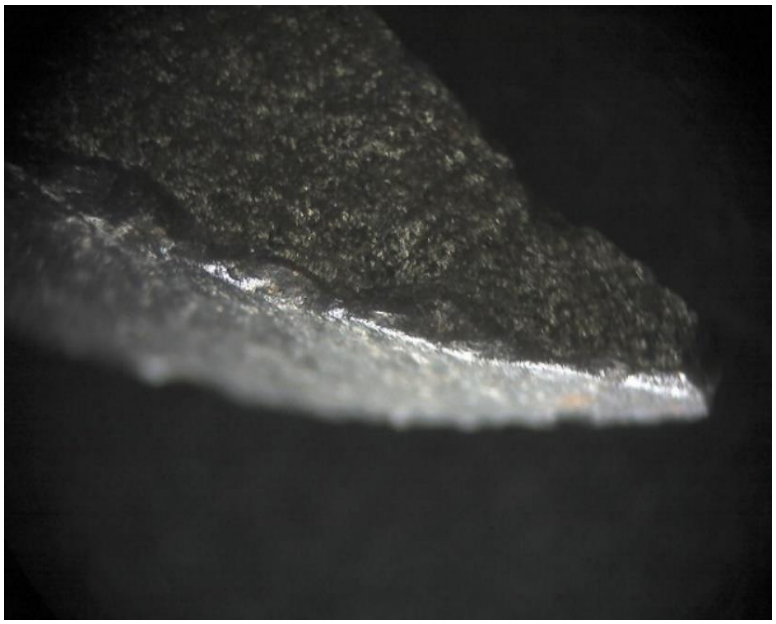

Figure 7-68. Flake 15-1878, micrograph of distal tip and dorsal ridge (30x). Scalar flake scars, broken distal tip, and abrasion; possible polish at tip and along ridge.

To clarify, the left ventral margin exhibits contiguous wear, with scalar and trapezoidal microflakes and edge damage, while the opposing right distal margin exhibits

almost no wear, except at the very distal end. This suggests that this face may have been used to scrape medium hard materials such as fresh tree boughs. The right ventral and opposing left dorsal margin exhibits interspersed wear including scalar microflakes and undiagnostic edge damage. This pattern is consistent with cutting activities on medium hard materials. The distal tip of the flake exhibits trapezoidal, and scalar microflaking as well as abrasion which had led to some rounding and possible polish. These patterns suggest the tool did not have a single use, but rather may have been used for cutting, scraping, and possibly drilling or graving of slightly harder materials such as wood.

CC-15-2010.01 is a heat treated secondary Temblor chert flake (Figure 7-69). This flake was recovered from Cave 3, Test Pit 11, context 0202, level 3 in the southwest quadrant. Only one margin on this flake exhibited evidence of usewear (Figure 7-70). On the right ventral margin, there are two clusters of relatively continuous set of short, shallow scalar microflakes along an irregular edge that take up most of the margin, about 10 mm (Figure 7-71). On the left dorsal side along the same margin, there are a few steep microflakes along a steep flat face which suggest abrasion (Figure 7-72).

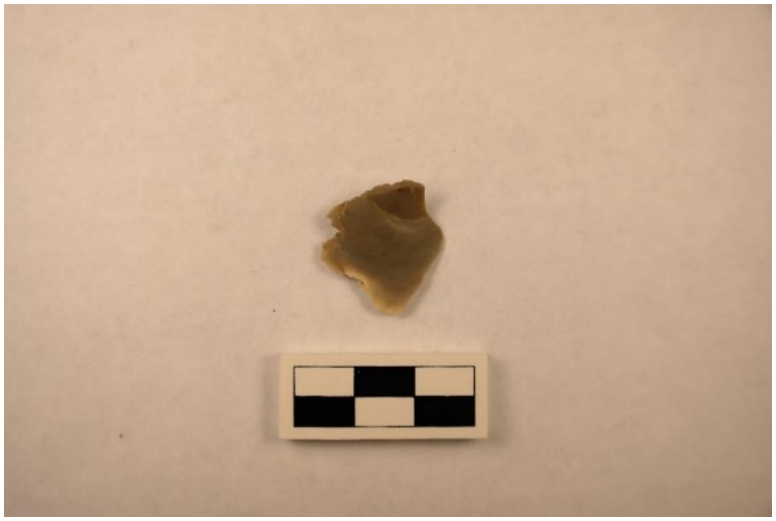

Figure 7-69. Flake 15-2010.01 from Cache Cave

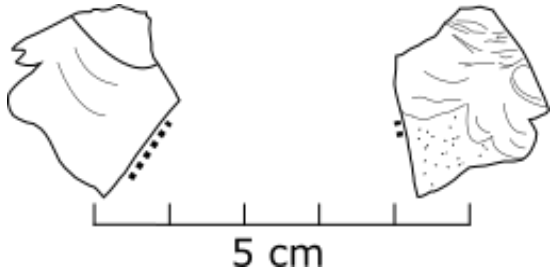

Figure 7-70. Sketch of flake 15-2010.01 indicating location of usewear. (Usewear identified by dotted line on illustration)

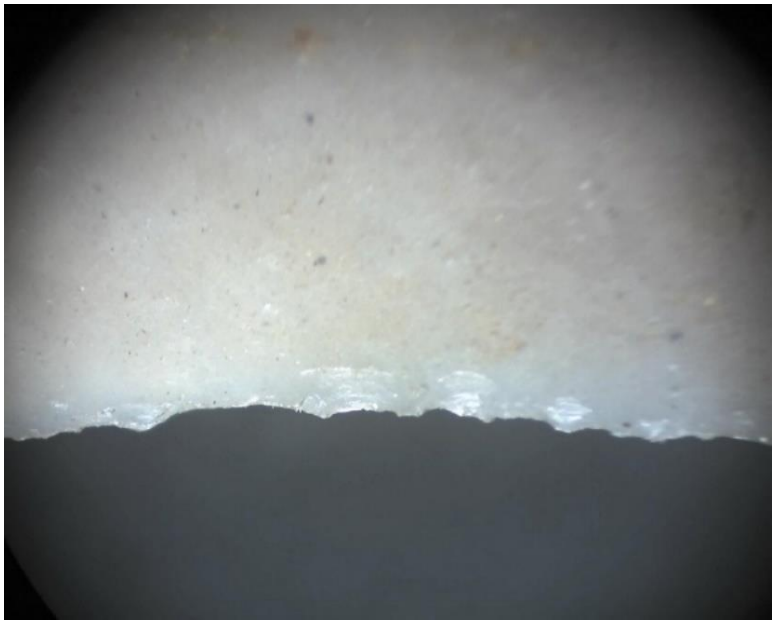

Figure 7-71. Flake 15-2010-01, micrograph of right ventral margin (60x). Continuous, short, shallow scalar microflakes.

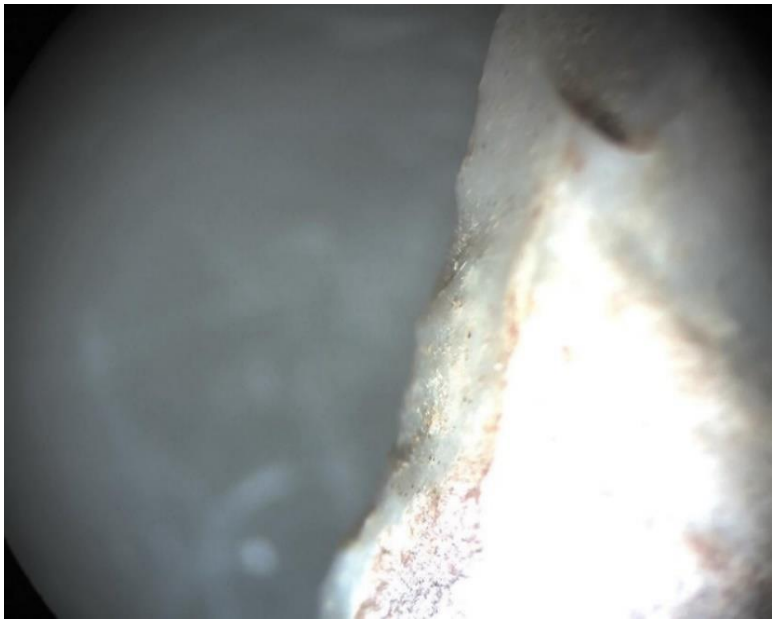

Figure 7-72. Flake 15-2010.01, micrograph of left dorsal margin (30x). Steep microflakes along a steep flat face, indicating abrasion.

The scalar flaking patterns, found predominantly on the ventral surface, suggests this flake was used for scraping, although not heavily. Additionally, the slight evidence

for steep scalar flakes along the same margin suggests it may have been used for other undetermined tasks on a hard material. The microwear on the right ventral margin looks notably similar to the experimental usewear production of Monterey flakes used to cut and scrape juncus.

Flake CC-15-2827 is a Temblor chert alternate flake recovered from context 020, level 3 in the eastern extension of Test Pit 11 (Figure 7-73). This flake exhibits very minimal usewear, present only on the right dorsal margin towards the middle of the flake (Figure 7-74). The microwear is present in the proximal half of the flake margin which is relatively straight. The margin becomes wider and irregular past the wear, further down the flake. The microwear consists of short, wide, scalar microflakes that develop in the initial phases of use, present along only 5.3 mm of the margin (Figure 7-75). Evidence of possible gloss is visible near the center of the usewear in Figure 7-75.

Figure 7-73. Flake 15-2827, dorsal surface

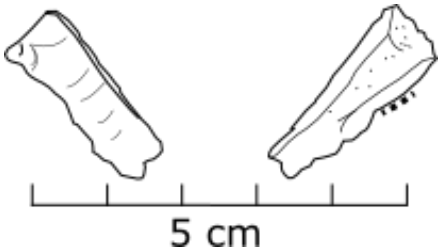

Figure 7-74. Sketch of flake 15-2827 indicating location of usewear. (Usewear identified by dotted line on illustration)

Figure 7-75. Flake 15-2828 from Cache Cave, micrograph of right dorsal margin (52.5x). Short, wide, scalar microflakes and evidence of possible gloss near center of image.

The presence of wear on only one face of one margin suggests the flake may have been used in a scraping motion. While it is possible that it the wear is natural edge damage, suggested by the minimal presence, the pattern looks similar to the early stages

of scraping use on medium soft plant material produced in the experimental portion of this project.

Additional Artifactual Evidence

The cave has an abundance of materials that may prove to be associated with storage of plant materials for future use in perishable technology production. Thousands of fragments of partially modified or unmodified dried plant pieces are present in the cave. Of particular interest is a feature excavated from Cave 2 during the 2016 field season which appears to be a discrete pile of cane placed against the northern cave wall. Though this feature had not been completely analyzed as of the completion of this thesis, it provides compelling evidence of intentional plant storage for purposes other than subsistence.

The cave also houses artifacts associated or potentially associated with many different stages of basketry production. As of 2015, two awls had been confirmed at the site, one from Cave 1 and one from Cave 3. In Cave 3, a tarring pebble was also recovered. Finally, a number of modified or worked shell and shell fragments have been identified in the cave. A few *Tivela* clam shell fragments have also been excavated. As of the completion of this thesis, no analysis has been conducted on the worked shell (excluding beads) or shell fragments, but like the natural cane material, their presence in the cave provides additional lines of investigation that can be followed up, as some of these shell objects might have been used in basketry production.

Importantly, in the early stages of analysis, after the first year of excavations in the cave, Edward Jolie analyzed the basketry and other perishable technology in the cave. In this assessment, Jolie noted that he found no evidence of onsite basketry production

(Jolie 2013). Jolie noted at the time that no raw material bundles or awls had been recovered, although both have now been identified. Further, Jolie noted that asphaltum and tar coated pebbles, and fires for heating tar were lacking. The asphaltum recovered from the cave mostly exhibits basketry impressions, suggesting it eroded off completed items. However, as just noted, one tarring pebble was identified in the cave as of summer 2015. Though no in-progress baskets have been recovered from the cave as of summer 2015, the presence of basketry production artifacts suggests the cave may have served as a place for making baskets after all, or as a place to store basket making materials when the work was not being done at nearby sites.

Summary of Evidence for Basketry Production at Cache Cave

The model predicted that upland sites such as the cave would have been used most predominantly for plant processing, but may have also been locales for harvesting and storing plant materials. Cache Cave is surrounded by lush plant resources that make it an ideal place to harvest and store needed plants for later use. Many primary basketry plants were observed near the cave including juncus, tule, sedges, rye, and willow. No formal macrobotanical analysis has been completed, which makes it difficult to determine what plants, if any, were used in the cave in the natural or freshly processed state. This also makes it difficult to infer site seasonality. However, the presence of discrete cane, or giant rye deposits observed in the 2016 excavations provide tantalizing, thought incomplete, evidence that people may have stored plant items in the cave for later use.

It was a challenge to identify evidence for basketry plant processing activities in the cave. The three flakes discussed above all shared traits that indicate they could have been used to process juncus or possibly wood, although the level of analysis conducted

make these identifications more speculative. Further, these three flakes were recovered from one excavation unit located in the smallest cave which was most likely used for caching objects. If the flakes were used to scrape or split juncus stalks, this was likely done in one of the more spacious caves, or even outside of the cave at nearby sites. Additionally, the recovery of modified shells from the cave may also provide evidence that the cave was a basket production locale. However, the modified shell has yet to be analyzed and cannot currently be interpreted as evidence for plant processing.

Late stage production evidence was also observed in the cave in the form of two awls and a tarring pebble. One awl and the tarring pebble were recovered from Cave 3, similar to the utilized flakes. The second awl was recovered from Cave 1, which is slightly larger than Cave 3.

This review of the available evidence suggest that the cave was likely a place of storage, not just for completed basketry and tools, but also for raw materials that people could dry out and retrieve at later times. Additionally, the presence of processing tools, an awl, and a tarring pebble in the small cave which appears to have been used for storage indicates that women were using the cave to at least store their weaving tool kits. This suggest that women may have also used the cave or nearby open areas as a workspace to prepare baskets at many different stages.

Discussion of Results

The experimental usewear replication and the site assemblage analyses provided results that address the primary question of this thesis: Is it possible to identify basket production in the archaeological record, and if so, where in the cultural landscape does this production take place? Although additional microwear analysis with different

techniques could increase the accuracy of interpretation, the experimental replication results indicated that differential patterns of wear do develop based on the type of task a flake was used in and the type of material it was used on. These results indicated that it was possible to make tentative inferences about the use of flakes in the prehistoric assemblages. A review of the different artifact assemblages from the four sites examined in this study indicated that each site displayed evidence of at least one stage of basket manufacture. Additionally, the activities associated with different stages varied across the sites, indicating that patterns of basket production could potentially be identified. While this chapter strictly provided the results of different analyses, the following chapter contextualizes these results and provides a discussion of what can be learned from the generated data.

CHAPTER 8: DISCUSSION AND CONCLUDING THOUGHTS

The purpose of this study has been to identify how the Emigdiano Chumash organized the production of baskets within their traditional social and economic systems. This subject was explored by asking if basket production can be observed in the archaeological record, and if so, where does production take place in the cultural landscape. The location and scheduling of production comprise the elements of basket making organization. To keep only to this simple definition is to miss the living essence of both the craft and its means of creation. Rather, by viewing the act of making a basket as a set of distinct yet interdependent tasks, accomplished in accordance with traditions passed on generationally, and carried out by individuals within a semi-sedentary society who moved across the landscape for any number of social and economic reasons, an understanding emerges that basket production takes place in a fluid, yet patterned taskscape.

Conceptualizing basket production as a taskscape orients this study to investigate the way the Emigdiano Chumash scheduled the harvesting, processing, storing, and weaving of basketry in accordance with social conceptions of time, such as the annual seasonal cycle, and the division of labor, notably influenced by gender. The locations at which these tasks would have been accomplished are likewise, influenced by the movement of people across the landscape through their seasonal round, and dictated, in part, by the gendered division of labor.

In attempting to parse out the organization of basket production in the traditional social and economic systems of the Emigdiano Chumash, I developed a model to predict when and where women might have engaged in different stages of production. This

model is based on ethnographic and archaeological data on basketry and settlement patterns, plant growth patterns, and division of labor. Although a detailed discussion of this model is presented in Chapter 4, it is reviewed here in brief, and compared with the results of analysis to evaluate the accuracy of the predictions. The following discussion is presented in the order of stages of production and the relevant data from each site is evaluated accordingly.

Modeling Harvesting Locales

The focus of this study has been on coiled juncus basket production, however, because willow, sumac, and deer grass are other common basketry plant materials that grow in the area, they have also been included in the discussion. Juncus appears to be available for harvest throughout most of the year, with a cultural preference for harvest in the late summer and early fall. Sumac and willow were harvested at different times by different Native California tribes, however, no groups appear to have harvested these plants in spring and early summer when they were growing. Deer grass has a more limited harvesting period, lasting between late summer and late fall. It appears that all of these plants had preferred or limited availability between late summer and early fall. Based on settlement pattern studies, people in the region were most likely living in upland seasonal villages at this time, engaged in the harvest and preparation of many other plant foods. Women likely scheduled the gathering of basketry plants along with the complimentary task of gathering other food and medicinal plants.

Based on this data, it is predicted that there will be greater evidence of basketry plant harvesting at Pond and Three Springs, which were likely occupied from summer into fall, based on paleobotanical seasonality data and settlement models. Although

Tashlipun may have been occupied for the longest period of time in a seasonal cycle, people tended to move out into the foraging radius and logistical radius to harvest available plants during extended periods of the year, particularly when basketry plants are simultaneously available for harvest. Cache Cave is further upland, away from the known village sites, and may have been used when people ventured into higher elevations in the fall to gather acorns and pine nuts. This suggests that Cache Cave may have been a place for gathering basketry plants late in the annual cycle.

A modest survey of contemporary plant communities at these sites resulted in the identification of some form of juncus and willow at *Tashlipun*, Pond, and Three Springs, and located in the riparian zone just outside of the Cache Cave. This indicates that every site may have had the potential to provide weaving materials that women could have harvested. However, a review of paleobotanical samples from the four sites show more variation. *Tashlipun* provided no hard evidence of common Chumash basketry materials in the paleobotanical samples. On the other hand, both Pond and Three Springs did show evidence of juncus seeds in their paleobotanical samples. A total of 15 charred seeds from 6 liters of soil were identified at Pond and 2 charred seeds from 18 liters of soil were identified at Three Springs. The preliminary review of paleobotanical materials in Cache Cave did not provide evidence of unmodified common basketry plant use in the cave. However, the presence of a substantial amount of plant materials and the identification of a natural bundle of cane tucked away in one of the caves suggests that there is more to learn from Cache Cave and that no definite conclusions can be drawn about this location as a harvesting locale at the moment. Grass seeds were common at all

of the open-air sites but were not identified down to the species, making it difficult to know if deer grass was among them.

These results support the hypothesis that the upland sites of Pond in particular, as well as Three Springs would be the most likely harvesting locales, evidenced by the presence of juncus in both the contemporary vegetation communities and the paleobotanical samples. Along with the fact these places would have likely been occupied when plants were available, these spaces, with ample bedrock mortars, dense middens, rich plant resources, represent women's economic domains, making it all the more likely these places were part of the basketry production taskscape. However, it should be noted that the task of harvesting juncus is not known to result in charred paleobotanical remains; this data may be evidence for the next stage of production. Additionally, there may be other locations in the landscape, not reviewed in this study, where women would go to retrieve the juncus they desired while they were living at the seasonal habitation sites. Further basketry plant surveys and mapping in the San Emigdio region would provide a clearer understanding of the places women may have visited to collect their weaving materials.

Modeling Processing Locales

The use of potentially unique processing tools, which could be identified in the archaeological record, was one of the main reasons coiled juncus basketry was selected as the focus of this project. As discussed in Chapter 3, utilized flakes or clam shells (T*ivela*) were used to scrape pith from the interior of split juncus, or to trim or size pieces to equal lengths and thicknesses. Additionally, to produce the golden tan color of many coiled juncus baskets, harvested stalks would be run through the reheated ashes of old fires,

potentially identified through thermal features and charred juncus remains. While coiled basketry made from sumac or willow also required the use of stone tools, many types of important utilitarian objects were made of wood and identifying evidence of wood working could not be directly correlated to basketry. To the contrary, the main reason juncus would be worked in the manners described, would be to make a coiled basket.

Processing locales are hypothesized as distinct from harvesting locales because juncus needs to be dried for many weeks or months before it can be processed, and in this time, there would have been potential for people leave a harvesting location and move to a different place in the landscape. Depending on the time of year the juncus was harvested, and the influence of other activities that people were engaged in, juncus harvested at Pond, Three Springs, or Cache Cave could have been processed at any of these sites or at *Tashlipun* as well. To determine at which sites people engaged in juncus processing, paleobotanical remains and flake tool usewear were analyzed. The number and presence of additional supporting processing artifacts were considered as well.

The results of this analysis indicated that the village of *Tashlipun* showed no evidence of juncus tanning. Further, the village exhibited only a single utilized flake, out of the 11 utilized flakes identified, with microwear indicative of processing plants for use in fiber technology; that is less than 1% of the utilized flake assemblage. This suggests that, while plant processing did likely occur at the village, it did not make up a major part of daily life. Pond showed greater potential as a processing locale. As stated in the previous section, 15 charred juncus seeds out of the 6 liters of soil indicate juncus was used on the site. The tanning processes of running juncus strands through warmed ashes could have charred the seeds. Additionally, out of the 10 utilized flakes identified at

Pond, 3 flakes, or 30%, exhibited usewear consistent with processing plants for use in fiber technology. Three Springs also exhibited two charred juncus seeds which may represent evidence of juncus tanning. However, this is a much smaller amount, compounded by the fact that these two seeds were recovered from 18 liters of soil. The utilized flake assemblage at this site produced interesting results. While only five flakes were identified, one was found to likely have been used to process wood and two were found to likely process other plant material. Focusing on evidence of juncus processing, this means that 40% of the utilized flake assemblage was used for plant processing in a way consistent with use in fiber technology. However, the assemblage is miniscule in comparison to the nearly 2,500 lithic objects recovered from the site. In any case, it appears that some level juncus processing could well have occurred at Three Springs, though with less intensity than at Pond. The evidence for juncus processing at Cache Cave is interesting and distinct from the pattern present at the other three sites. Out of the 13 flakes examined under the microscope from this site, three were found to exhibit usewear associated with processing wood and plant material. However, the usewear does not resemble the experimental examples of juncus, yucca, or wood processing as well as the flakes from the other sites. Additionally, all three flakes were recovered from cave 3, the smallest cave at the site and the one most directly associated with caching activities. Further, the cave was not likely used to tan juncus in preparation of use, indicated by the fact that no hearth features have been documented in this extensively excavated site which is completely sheltered.

These results suggest that Pond exhibits the greatest potential as a juncus processing locale, with Three Springs representing a potential second processing location.

Pond is the closest seasonal camp to *Tashlipun*, and as such might have been an early stop in the seasonal transition to upland areas. This indicates that juncus harvested here could have been harvested earlier in the season and thus may have been ready for processing before women left for other areas or when they returned from other places. As these bedrock milling camps were likely occupied for an extended period of time during the plants preferred harvest period, it aligns with the modeled mobility patterns. Additionally, Pond and Three Springs were places where women engaged in many other types of plant and food processing, evidenced by the mortars, groundstone, and other lithic food processing tools. As women might have scheduled basketry plant harvesting with the gathering of other plant food resources, so too could they have used the late summer and early fall months to engage in much of their plant processing tasks for the year. This further supports the concept that bedrock milling sites are part of the female productive taskscape.

Modeling Storage Locales

Prior to processing juncus, the strands must be left to dry out in cool dry places where the plants will not become too brittle and where they will not mold. Additionally, once the juncus has been processed, it can be stored for quite some time prior to its use. In this way, juncus storage has the potential to occur at any site at any time of year. The storage stage of the basket production cycle is passive, but should at least considered from an archaeological perspective. Sites that exhibit natural cool dry spaces or show evidence of structures could have been used for storing plants. Three sites exhibit these qualities and are therefore considered in this study to have the highest potential for use in this stage.

Cache Cave, as its name indicates, was a place where many perishable fiber artifacts and modified fibers were stored. The cave is also filled with bits and pieces of tule, cane, yucca fibers, and more. Additionally, the identification of a discrete pile of cane in one of the caves suggests that this place was used for the specific purpose of storing raw, unmodified plants for later use. Pond also has small rock shelves and a little rock shelter where freshly harvested plants could have been placed to dry or where processed weaving strands could have been kept until needed. Three Springs also has two shelters which could have provided storage space.

The patterns of potential storage locations across the landscape indicate that women had a wide variety of options available to them. It is not possible know which of these places was used, if any, to store fresh or processed juncus, but harvesting and processing evidence at Pond, and to a lesser degree at Three Springs, suggests that this place would have been a reasonable locale to store materials between stages. Further, the presence of raw plant materials in Cache Cave intimates that this place too, may have been used to store basketry materials while not in use.

Modeling Weaving Locales

The tools associated with weaving and finishing a basket are the ones that most often come to mind when thinking of basketry. The presence of awl and tarring pebbles at a site can be used to infer that women were engaged in basket production in the area. Lesser considered artifacts associated with the final stages of production are water vessels, used to keep water nearby for making weaving strands pliable.

Weaving is known to take several weeks to several months to complete, suggesting that it is more likely to occur at long term habitation sites. This is supported

by the identification of many awls and tarring pebbles at several different Chumash villages. This makes *Tashlipun* the most likely locale for late stage basketry production.

The results indicate that four worked bone artifacts were identified at *Tashlipun*, only one of which was complete enough to be identified as a potential awl. However, the other worked bone objects are also made from larger mammal bones and have rounded or pointed ends. *Tashlipun* also exhibited 13 tarring pebbles, nearly 750 fragments of dried asphaltum, and a steatite bowl fragment. This data suggests that final stage basket production did occur at *Tashlipun*, as anticipated. No worked bone artifacts were recovered from Pond, however, at least one known, and seven potential tarring pebbles were observed. The tarring pebble data for the site is not currently reliable enough to confirm how common tarring was at the site, but the presence of at least one artifact indicates that taring activity did occur to some degree. A stone bowl fragment was also originally recorded at Pond, but it was later identified as a portable mortar. Identified at Three Springs were four stone bowl fragments and a few asphaltum fragments, neither of which are exclusive evidence for basket production. Cache Cave exhibited an amazing amount of fiber technology artifacts, ranging from decorated coiled basketry to crimped fragments of tule. Further, detailed analysis of the perishable artifacts from this site is needed to determine if late stage production can be identified in the fibers themselves. However, as of 2015, two awls have been recovered from the Cache Cave, one from the likely storage locale, Cave 3, but also from the larger Cave1. A tarring pebble was also identified in the excavation of Cave 3. These results suggest that weaving could have occurred in the cave, or was likely occurring in the area around the cave at some point in the past.

This data supports the models prediction that final stage production is more likely to occur at the village. The seasonal camps do not appear to be places where weaving basketry was part of daily life. Interestingly, Cache Cave, located in the far interior, most distant from the village exhibits the second most abundant evidence of late stage basket making. The reason for this is yet unclear, but it could potentially mean that people stored weaving tools in the back country to safeguard against the trouble that could ensue from loss of a basket, or that people spent a good amount of time in the area and engaged in weaving activities in and around the cave.

Concluding Thoughts

The patterns observed for basket production in the Emigdiano Chumash territory do not necessarily reflect a pan-Chumash practice; these diverse communities, living in widely varying environments, with distinct settlement pattern practices are too different to warrant such an assertion. However, the model developed here to investigate the pattern of production has potential to illuminate basket production patterns in other regions.

For the Emigdiano Chumash, the material remnants of a living past show themselves to cluster in a way that reflects a once thriving basket production taskscape. After a sedentary winter, spent engaged in daily pursuits of village life, plants would emerge and grow in the spring and summer, waking with them, the season of harvesting and processing. As families dispersed from the village to take advantage of freshly available plants, women appear to have scheduled into their food gathering and preparation, the similar tasks associated with basket production. Busy days were spent around the seasonal milling camp of Pond with seed beater and mano in hand,

occasionally put down and replaced with juncus and processing tools. As the year grew later and summer turned to fall, families would again disperse from their temporary congregation at the seasonal camp into the places where the acorns and the pine nuts were ripe in the higher and cooler elevations. While families were occupied in the harvesting and processing of some of their most important food resources, women would find time to gather the juncus which grew around the springs and ponds found in the valleys and canyons of the San Emigdio Hills. As autumn faded and winter came on, the community would again gather at *Tashlipun* until the plants ripened again. In this time between, individuals engaged in all sorts of activities at the village. It is here, in these periods where the plant foods were all stored and there was possibly greater time to dedicate to lengthy tasks, women wove the materials they had wrought the prior seasons, making all the needed trappings of a home, making hats and game pieces and offerings for loved ones passed.

The basketry taskscape is just one strand in the tapestry of taskscapes that made up the lived experiences of Emigdiano Chumash women. This study has sought to highlight how much basketry was integrated into women's lives, not just in daily activities as finished tools used for specific purposes, but how much it was integrated into the very social landscape, with each place imbued with the memories and the knowledge from generations of women who came before.

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