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*Aut inveniam viam aut faciam*
I shall either find a way or make one.
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Cooking is an often neglected topic in studies of prehistoric California and the Great Basin. This is unfortunate because as this thesis demonstrates, cooking is prevalent throughout the archaeological record and can reflect on technological, social, and cultural change. The task-differentiation framework was utilized to study the role of women as it relates to cooking and food processing within the traditional Washoe territory. The results of a 2012 excavation at the Sugar Loaf Site in Sierra Valley, Plumas County, California are detailed. This excavation revealed a single rock-lined flat-oven dating to around 1300 B.P. A total of nine bedrock milling features with 36 milling slicks, mortars, and cupules were also recorded.

In addition to the excavation, a total of 142 cooking features from 22 different sites within the Washoe territory were analyzed. These features were sorted into
functional type and construction method. Results of this study indicate that bulk processing was likely not the primary purpose of most cooking features in the region, though it certainly appears to be occurring. Though the exact purpose of these features remains inconclusive, most appear to be multi-function cooking facilities utilized for a variety of foodstuffs. There is a notable rise in the number of cooking features in the region after 1500 B.P., with the most intense increase beginning just before 1000 B.P. Based on the limited data available, re-use of the cooking features seems to be common.
CHAPTER I

INTRODUCTION

Cooking has long been part of human history, perhaps for 200,000 to 300,000 years (Brace 2000; James 1989; Wrangham et al. 1999). It is essential to daily life and transforms food into a physically and culturally edible product (Wandsnider 1997). For the purposes of this study, cooking is defined as the process of making food fit for human consumption by applying heat. This may include baking, boiling, smoking, roasting, steaming, and frying (Rodriguez-Alegria and Graff 2012; Subías 2002). Cooking is often inextricably linked to food preparation activities, including grinding, soaking, cutting, and chopping. The overall process of food preparation and cooking can remove toxins, reduce chewing time, improve digestibility, and lengthen storage-life. It may also reflect the cultural traditions, economy, and the environment of a group.

In prehistoric northeastern California and the Western Great Basin, cooking has largely been ignored or minimized by archaeologists until recently. It is more prevalent in the archaeological record than is often acknowledged and can be observed and studied in a variety of ways. There are an assortment of permanent cooking features such as hearths, earth-ovens, and steaming and roasting pits. Secondary indicators of cooking activities might include permanent features like bedrock mortars and milling slicks as well as portable artifacts. These artifacts include multiple types of ground stone, basketry, and tongs, among other important utensils. Permanent bedrock mortars and
milling slicks were used for grinding and pounding food, ochre, and medicines. Portable ground stone artifacts can be defined as stone objects created through grinding, abrasion, polishing, or otherwise impacting the stone (Adams 2002). Ground stone may have many purposes: processing foods, medicines, and pigments using implements including manos, metates, and pestles. Other types of ground stone types include hammerstones and abraders.

In addition to directly studying the cooking features themselves, cooking can be seen through isotopic, botanical, and faunal analyses. Isotopic analysis of human remains recovered during archaeological investigations allows archaeologists to get an idea of the past diets of specific individuals, while zooarchaeology and botanical analysis can lend more information about details of the diet of a group of individuals, as well as their cooking and butchering practices (Hastorf and DeNiro 1985; Subías 2002). This thesis looks directly at primary indicators of cooking (cooking features) and secondary indicators (grounds stone and bedrock milling stations), which make up the prehistoric kitchen.

Typically, archaeologists describe cooking features and relevant ground stone implements in the most basic terms, especially in comparison with lithic assemblages (Noble 2011; White 1980). For instance, ground stone is often merely described by its morphology and categorized into basic types. Cooking features are often lumped into the all-encompassing categories of “hearth” or “fire-pits.” In reality, in the prehistoric western United States, well preserved remains of cooking features can often be described down to the specific type of cooking being done, such as direct cooking, roasting,
steaming, or frying. In contrast, if projectile points were described in the same way as cooking related artifacts and features are and labeled only as “arrow” or “spear sized”, in-depth chronologies could not have been developed and tested (White 1980).

Changes in cooking techniques and developments in technology might be indicative of subsistence changes as well as changes in resources exploitation. These are two important issues in current California and Great Basin archaeology (Thoms 2009; Waechter and Andolina 2005). Further, cooking and food preparation activities may shape the household or village setup, dictating the layout of major parts of these sites and perhaps having a hand in directing daily life (Subias 2002). The remains of food processing and related cooking activities can also reveal information about mobility and group dynamics. This is evident in the use of bedrock mortars, a permanent, sometimes ownable space. With the Washoe of northeastern California and western Nevada, a single bedrock mortar at a site could indicate a habitation site with just a single miller. On the other hand, multiple mortars might indicate a place where a larger group or groups gathered together (Rucks 2012).

It should now be readily apparent that the remains of cooking activities can convey to archaeologists a wealth of knowledge about the past. Investigations of cooking and other domestic activities have been considered a relevant course of study for archaeologists interested in colonial contact situations and large-scale societies (Brumfiel 1991; Lightfoot et al. 1998; Scaramelli 2012; Stein 2012). So why has the subject gone relatively unaddressed until the present in California and Great Basin archaeology? Perhaps this phenomenon has to do with the idea that cooking is generally perceived as
part of everyday life and has been considered entirely too mundane to be of much value to archaeology (Rodriguez-Alegria and Graff 2012; Gero 1985). Lack of studies may relate to the perceived dichotomy between the notions of public and domestic spheres of life (Conkey and Spector 1984). Cooking has often been relegated to the domestic sphere, with little perceived relevance outside that domain. The domestic sphere is generally associated with women, having minimal significance to larger social contexts which involve the group as a whole and has been considered inconsequential in the formation of other social processes (Subías 2002). Studies of cooking and food processing show this is simply not true (Smith et al. 2001; Subías 2002; Thoms 2008; Wandsnider 1997). On the contrary, cooking and food processing can be essential to supporting and shaping social life (Subías 2002).

In many situations, food processing and cooking has been the work of women, slaves, and the lower class; groups which are notoriously understudied (Subías 2002, Twiss 2012). One reason for this as suggested by Gero (1985) is that archaeologists are caught in a socio-political paradigm where research reflects current ideologies or the notion of the “paradigm of the present”. This paradigm is slowly shifting. The explanations for the lack of study are numerous, but such an important aspect of daily life can no longer be ignored by archaeologists. It is for these reasons and more that this thesis focuses on what can be learned about prehistoric cooking features in northeastern California and the western Great Basin.
Purpose of Study

This study takes an in-depth look at the development of prehistoric cooking technology within what is known as traditional Washoe territory. By studying cooking within the “domestic sphere” this thesis begins to investigate a previously neglected topic in much of prehistoric archaeology. Specific focus is given to the transition within the study area and much of North America to the use of cook-stones. Following Thoms (2009): cook-stones can be defined as elements of surface griddles, rocks used in steaming and roasting pits, and are also referred to as hot-rocks. Cook-stones may also be used for stone boiling. All of the aforementioned cooking facilities will be defined more carefully in Chapter II under the Resource Intensification section. For the purpose of this study both the terms “cook-stone” and “hot-rock” may be used interchangeably.

Emphasis will be on Bureau of Land Management (BLM) site number 23.15.21.01., known from here on as the Sugar Loaf Site. This prehistoric site is located in northern Sierra Valley, California. The site, excavated in 2012, contains at least one rock-lined cooking feature as well as multiple milling stations, including bedrock mortars, milling slicks, and cupules. The artifact assemblage includes multiple fire affected ground stone fragments, diagnostic projectile points, a variety of lithic materials which are comprised primarily of pressure flakes, and one very interesting donut shaped stone. This assemblage will all be discussed in depth in Chapter IV: Sierra Valley and the Sugar Loaf Site.

By synthesizing what is known about cooking in the traditional Washoe territory, this thesis looks at the development of cooking technology over time. Subjects
explored include the entry of hot-rock cooking technologies into the region, if and how
technology changed over time, and what this development might indicate in terms of
subsistence, social dynamics, and resource exploitation. This study hopes to determine if
there are clear trends in the development of cooking features and if these changes in
cooking technologies can be linked to specific time periods within the study area. A well-
known and frustrating issue within archaeology is the problem of “gray literature” which
makes access to some reports and documents difficult and time consuming. Therefore, a
secondary goal is to create an easily accessible reference guide for those interested in
analogous work in the region. This thesis seeks to serve those wishing to further explore
the topic of prehistoric cooking as a jumping off point for future research.

Thesis Overview

The remainder of this chapter outlines the study area. This section will include
more in-depth geographic data and a general environmental overview of the Sierra
Nevada and the Great Basin. Chapter II: Theoretical Background begins with the theory
of how prehistoric cooking has changed through time and will cover the various
theoretical views upon which this thesis is built. Theories include foodways and cooking
systems, food and heat treatment, resource intensification and expected patterns of
cooking technology development over time, and women in the archaeological record.
These theories are used in combination with the task-differentiation framework, to
develop a set of expectations which will be tested and then discussed in the final chapter.
Chapter III: Prehistory, Ethnography, and Cooking in the Washoe Territory examines the prehistory of the study area and the ethnographic background of the Washoe, especially as this relates to cooking, food acquisition, and processing. Chapter IV: Sierra Valley and the Sugar Loaf Site looks at a site excavated in 2012 in Plumas County, California. The Sugar Loaf Site is the primary focus and motivation for this study. The methodology, preparation for fieldwork, excavation, and post-fieldwork analysis are considered. Results of the excavation, radiocarbon dating, and floatation are discussed. Chapter V: Cooking in the Eastern Sierra: Data and Results covers a compilation of data on other relevant sites containing cooking features within the study area. This thesis concludes in Chapter VI: Discussion, Interpretation, and Conclusion with an interpretation of the results of this study. It also explains how the expectations outlined in Chapter II compared with the results of research and the excavation. This final chapter concludes with some of the limitations of this study and looks to the future with suggestions for future research topics.

Study Area

It is imperative to establish a clear picture of the ecological context of the study area in order to understand what resources were available during certain times in prehistory. This background information is relevant as it clarifies what resources may have been available and what their relative abundance and accessibility was. In order to focus the synthesis of data to a manageable workload, the study area must be limited spatially. The study area used in this thesis is essentially the same as the traditional
Washoe territory. This territory contains two zones described as nuclear or core use and periphery use areas, which can be seen in Figure 1. The core use area is where the majority of the ethnographic Washoe habitation activity took place. Periphery use areas were utilized for resource acquisition but habitation was limited to the core use area (Kowta 1988). Therefore, the core use area is the focus of this study. However, two of the archaeological sites analyzed here are in the periphery use area, which likely fluctuated over time, so these sites are included in the study. In accordance with Kowta (1988), the core use area is focused approximately on Lake Tahoe and reaches the southern shores of Honey Lake in the north and down to Sonora Pass in the south. The Sierran Crest makes up the western boundary and the territory stretched east to the Pine Nut Mountains and Virginia Range in Nevada. The Washoe Tribe of Nevada and California (2013) describes very similar boundaries.

This territory encompasses parts of two major and very different geological zones: the Sierra Nevada and the Great Basin. Due to its geographic diversity, this area covers a wide variety of environments and offers intermittent resources. The Washoe homeland ranges in elevation from around 914 meters in the Great Basin to 3658 meters above sea level in the Sierra Nevada. It “is a region of dramatic topographic relief” (Wigand 2005:1). Climatic data from the last 50 to 100 years shows that historically, precipitation in these areas greatly differs. The region around Lake Tahoe in the Sierra receives on average a total of 101 cm of precipitation a year, while, around the area near Pyramid Lake in the Great Basin only receives 18 cm per year (Western Regional Climate Center 2013).
Figure 1. Maps showing territory boundaries of the Washoe tribe including core and periphery use areas.

Source: Adapted from description by Kowta, Makoto, 1988 The Archaeology and Prehistory of Plumas and Butte Counties, California: An Introduction and Interpretive Model. California Archaeological Site Inventory. Report on file at the Northeast Information Center, California State University, Chico.
Great Basin

The Great Basin is a large, extremely diverse, and topographically varied region containing an assortment of plant and animal species (Fowler 1986). It covers roughly 477,664 square kilometers through what are now Nevada, California, Oregon, Idaho, and Utah. Comprised of a series of basin and ranges and north-south trending mountains, the Great Basin sits in the rain shadow of the Sierra Nevada. The Sierra Nevada dramatically influences rainfall throughout the region and produces an arid environment (Wigand and Rhode 2002).

This region was not always so dry and has been subject to extreme climatic fluctuations for centuries. In the Late Pleistocene, approximately 250,000 to 12,500 B.P., the Great Basin contained a series of lakes. Known today as Pleistocene lakes, remnants of these bodies of water are evident throughout the region. The shift from the end of the Pleistocene to the Early Holocene (12,500 to 8000 B.P.) in the Great Basin was marked by the expansion of desert scrub communities, particularly after 9000 B.P. As the climate grew warmer and drier, these plant communities expanded into the drying Pleistocene lakebeds. The Middle Holocene (8000 to 5500 B.P.) brought extreme drought to the region. Junipers contracted their range to higher elevations and some marshlands dried up. This drought terminated around 5400 B.P. The ensuing period saw a dramatic increase in winter precipitation, expansion of forests and woodlands, and rising of lake levels. Overall, the climate was wetter but punctuated with droughts. Beginning around 2000 B.P., a general trend back to warmer and drier conditions and milder winters occurred (Wigand and Rhode 2002).
Following this time was the Medieval Climatic Anomaly (MCA), a period defined by a series of intermittent and severe droughts. Time estimates vary for this period across California and the Great Basin. For Sierra Valley, discussed below, it has been proposed that the MCA occurred from 1000 B.P. to about 500 B.P. (Waechter and Andolina 2005). Regardless of the exact dates, these droughts likely had heavy impacts on trade, technology, subsistence strategies, and settlement patterns (Jones and Schwitalla 2008). What is important to note is that this climatic fluctuation dramatically altered what resources, including water sources, vegetation, and animals were available to prehistoric inhabitants of this region and much of the West.

Important large game species in the Great Basin include bighorn sheep (*Ovis canadensis*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), and in some places elk (*Cervus canadensis*). Other important game includes small mammals like the black-tailed jackrabbit (*Lepus californicus*), which was often gathered prehistorically through the use of game drives. Birds such as sage grouse (*Centrocercus urophasianus*) were commonly captured through the use of nets. Prehistorically, where water sources were available, fishing for members of the sucker (*Castomidae*) and minnow (*Cyprinidae*) families was common (Fowler 1986). Other fishes were available but more limited geographically.

Plant communities of the northwest Great Basin include a variety of annual and perennial grasses, shrubs, and some forested areas. These species have been impacted by the introduction of farming, ranching, logging, and other historic and modern encroachments (Fowler 1986, Waechter and Andolina 2005). Dominant plant species in
this area include: multiple types of sagebrush (*Artemisia tridentate*), rabbitbrush (*Chrysothamnus viscidiflorus, Ericameria nauseosa var. speciosa*), Antelope bitterbrush (*Purshia tridentata*), and Western and Utah juniper (*Juniperus occidentalis var. occidentalis, Juniperus osteosperma*) (Waechter and Andolina 2005). Edible plants include multiple types of pinyon pine, roots and corms, berries, and seeds (Fowler 1986).

**Sierra Nevada**

The entirety of the Sierra Nevada lies within about 63,100 square kilometers and covers a length of 640 kilometers transitioning in the north into the Cascade Range near Lassen Peak. The width of the Sierra Nevada averages around 105 kilometers and elevation ranges from 122 meters on the boundary with California’s Central Valley to 4421 meters along the Great Basin. The Sierra splits into two branches near Lake Tahoe, one to the west that “occupies a down-dropped fault block” and one to the east that becomes the Carson Range (Norris and Webb 1990:63). In terms of geology, this mountain range contains primarily igneous and metamorphic rocks with varied age and composition. Granite is the most commonly observed form of igneous rock in the Sierra Nevada (Norris and Webb 1990).

Ecologically, the Sierra Nevada is another extremely diverse zone. At higher elevations alpine meadows, subalpine, and montane forests exist, while woodland, scrub, and chaparral communities can be found at lower elevations (Moratto 2004). At the highest elevation, above 2900 meters, lies the alpine belt. This zone is dominated by low shrubs and typically cannot support trees. Summers are short and winters are long with
heavy snow (Schoenherr 1992). Few animals live at this elevation, though bighorn sheep do venture into the alpine zone (Benson 1988).

Below the alpine zone is the aptly named subalpine zone, which lies from about 2100 to 2900 meters above sea level (Verner and Purcell 1988). Like the alpine zone, the growing period is short and winters are long and harsh, often carrying heavy snow. This zone is sparsely forested, with various species of pine tree and mountain hemlock (*Tsuga mertensiana*) (Schoenherr 1992). Like the alpine zone, few animals find this climate ideal. Bighorn sheep also utilize this zone (Verner and Purcell 1988).

The montane forest includes the upper and lower montane. The upper montane forest begins near 2100 meters in elevation. Summers are short and cool and winters are cold and wet with snow accumulations near 1.3 meters. Jeffery Pine (*Pinus jeffreyi*) and Western Juniper are common trees in the upper montane forest (Schoenherr 1992). In contrast, the lower montane forest begins at around 900 meters above sea level, summers are hotter and drier than in the upper montane, while winters are milder, though snow may accumulate on the ground for several months. Mature forests and meadows are common in this zone. Tree species include ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), and white fir (*Abies concolor*) (Fites-Kaufman et al. 2007). This zone dominates the middle elevations of the Sierra Nevada (Schoenherr 1992).

The foothill belt is comprised of woodlands, grasslands, and oak savannahs. Summers are hot and dry and winters see very little, if any snow. This zone contains a variety of shrubs or chaparral as well as ethnographically important tree species including: gray oak (*Quercus grisea*) and interior live oak (*Quercus wislizeni*). Animals
common to this zone include mule deer, black bear (*Ursus americanus*), bobcat (*Lynx rufus*), ground squirrel (*Sciuridae*), brush rabbit (*Sylvilagus bachmani*), California valley quail (*Callipepla californica*), and mourning dove (*Zenaida macroura*) (Morrato 1984).
CHAPTER II

THEORETICAL BACKGROUND

The archaeological theory behind prehistoric cooking studies in North America is still a growing body of work. While there has been a copious amount of work done on other aspects of foodways; cooking and pre-consumption practices are far less studied. True systematic studies of food, and therefore in some instances cooking, have been ongoing for the past twenty-five to thirty years. Studies conducted in the 1970s and 1980s have largely focused on the biological and ecological aspects of food in prehistory, taking what is known as a processual approach. Through the processual paradigm, archaeologists interested in food studies have focused on the ecological and nutritional aspects of food, rather than being concerned with the larger social context in which food is engulfed. In the 1980s and 1990s a paradigm shift in archaeological thought occurred. Archaeologists interested in food began to use what is now termed the post-processual paradigm to study the social context of food. This includes gender, human agency, and native perspectives. The post-processual approach also began to critique the processual paradigm for its total focus on the ecological and nutritional aspects of food (Twiss 2012).

This thesis takes a processual-plus approach to the study of cooking. Processual-plus has been defined as an integration of gender, meaning, and agency studies into a largely ecological and processual approach (Hegmon 2003; Twiss 2012). In
this case, there is validity to both the processual and post-processual approaches, but each is lacking individually. Cooking is a chemical manipulation of food and depends heavily on resources available; therefore, the ecological and nutritional background of the food item being studied is paramount. At the same time, cooking is highly social and symbolic. It is for these reasons that this thesis seeks a middle ground of both the processual and post-processual paradigms. Regardless of the paradigm label employed, this author seeks to understand the social meaning of cooking without disregarding the biological and ecological aspects inherent in food and food preparation.

The remainder of this chapter emphasizes the main theories that underlie this entire thesis by looking at foodways and cooking system design, land-use and resource intensification, and site formation and women’s roles in prehistory. The Foodways and Cooking Systems section looks at how cooking is a part of the larger process of foodways. These complicated processes can involve the interaction of multiple groups within a culture. Understanding foodways sheds light on how a group acquires food, processes, consumes, and discards it. It also reflects on the symbolism that may underlie all these activities. These actions define many aspects of social interaction. The Food and Heat Treatment section examines the chemistry behind cooking food and the changes in nutritional value the process may confer on a food item. Understanding this process reveals one of the many reasons why cooking is important. The Resource Intensification and Expected Patterns of Cooking Technology Development section delves into how developments in cooking technology may relate to changes in land-use and resource intensification, which is one of the most studied aspects of cooking (Thoms 2008, 2009;
Stahl 1989). The final section, entitled Women and the Site Formation Process, discusses how we can understand the role of cooks and women in prehistory through the interpretation of site formation and design. Finally, this chapter concludes with a set of expectations based on these theories.

Foodways and Cooking Systems

Cooking is part of a system of foodways unique to a culture. The term foodways denotes the entirety of the human interaction with food, from the initial stages of production and acquisition all the way through to disposal. According to Goody (1982), food is first procured (production or acquisition) through gathering, hunting, growing, raising, or trading. Next, the food is prepared or processed through multiple activities including, but not limited to: butchering, winnowing, leaching, grinding, pounding, and cooking. Food is then consumed and finally tossed out during the discard phase. During the production, processing, or consumption phases, food may be stored, distributed, or shared. The preparation/processing phase, under which cooking occurs, happens in two main stages. First is the initial preparation, where raw resources are readied for storage, transport, or cooking. The second stage is known as pre-consumption which includes: cutting, grinding, soaking, and cooking. The scale upon which food processing is conducted daily and for special events can be reflective of the labor organization in place and the number of consumers present in a given culture (Twiss 2012).
Stahl (1989) proposes that cooking systems are designed by individuals to minimize toxins, maximize nutrient value, or do a combination of both. Cooking systems are composed of a series of activities, which make up the cooking system design. It entails a manipulation of the properties of food including moisture, temperature, pH levels, and surface area. All these manipulations allow certain desired physical and chemical changes to occur. Benefits of cooking include improved digestion, which often allows more nutrients and energy to be absorbed, reduced chance of parasites, illness, and food-borne diseases (Wandsnider 1997). It should also be noted that cooking enhances flavor and makes otherwise undesirable foods palatable.

The cooking system design is made up of many factors, these include: whether the food is being prepared for immediate consumption or storage, the number of consumers, the labor requirements, food composition and chemistry, and the available materials for cooking (fuel, heat reservoir, and container). For example, food cooked for storage will be prepared differently than that for immediate use (Stahl 1989, Wandsnider 1997). By studying what resources were available, how they were procured and treated throughout the entire cooking system, will help build larger interpretations of regional patterns of technological development, inform on environmental changes, hint at fluctuations in social relationships, and gender roles.

Food and Heat Treatment

In order to understand the cooking system and the greater concept of foodways, it should be established what cooking accomplishes in terms of the
manipulation of food properties. Different foodstuffs will have different cooking requirements. These include required temperature, cooking duration, containers, and/or other facilities needed to cook different food items. Various cooking methods will also confer different benefits on the food item being cooked (Thoms 2008; Wandsnider 1997). Ultimately, these differences should be and often are reflected in the archaeological record.

While cooking has been shown to be responsible for some nutritional losses, especially in terms of vitamins and minerals, it also provides many benefits for the consumer in terms of improving digestion and reducing toxicity (Stahl 1989). Heat-treatment transforms food by beginning the hydrolysis process outside the human body. Hydrolysis is the mechanism by which complex molecules, (carbohydrates, proteins, and fats) are reduced to smaller and more digestible molecules through the introduction of water. The body does not break down all of these complex molecules equally on its own, so not all necessary nutrients are extracted. Heat treatment aids in the breakdown of these molecules. Through heat-treatment, the hydrolysis process begins extrasomatically and allows the body to complete the digestion process, increasing the energy value of the foodstuffs being consumed (Wandsnider 1997). In other words, cooking begins to break down complex carbohydrates, proteins, and fats outside the body, making it easier to absorb nutrients and complete digestion.

Carbohydrates are composed of sugar, sugar alcohols, and structural polysaccharides, and reserve or storage polysaccharides. These occur in plant foods. Sugars include glucose and fructose, which are found in fruits and vegetables. They are
the easiest carbohydrates to digest without the aid of heat treatment and can be absorbed into blood vessels in the small intestine. Structural polysaccharides are commonly referred to as dietary fiber and are much harder to digest. Reserve polysaccharides can include starch, glucose polymer, and fructan and are also difficult to digest. However, both structural polysaccharides and reserve polysaccharides can become physically and chemically easier to digest through heat treatment (Wandsnider 1997). Basically, cooking foods with high levels of dietary fiber, starch, glucose polymer, and fructan will aid in digestion.

One of the most important benefits for pit roasting comes from the ability to process plant resources in bulk. Many plants processed in earth ovens contain inulin, a type of dietary fiber classified as a fructan. Inulin is contained in various levels in plants. Inulin-rich plants, like camas (Camassia quamash), a bulb, require long applications of heat to become digestible. For these types of resources a cooking facility such as a rock-lined earth oven, where moderate temperatures could be retained for extended periods of time would be ideal. Use of these facilities for cooking has been observed ethnographically (Thoms 2009; Wandsnider 1997).

Proteins are comprised of complex chains of amino acids. Proteins are found in plants and animals, as well as milk and eggs. Simple amino acid chains are easier for the body to break down than more complex ones, which often pass through the digestive system partially digested. Heat-treatment allows the protein to become denatured. Denaturation is the weakening of the bonds of the protein chain. This not only makes food easier to chew, but also to hydrolyze and digest (Wandsnider 1997). Typical muscle
protein will denature after exposure to temperatures between 40° and 60° C. At higher temperatures, high-quality muscle proteins lose water-holding capacity and become tough to chew. This type of meat only needs a relatively short amount of exposure to heat, at relatively low temperatures. Conversely, those muscle tissues containing collagen or connective tissue are tough to chew when heat is too lightly applied. With prolonged exposure to heat, these proteins become tenderer. For muscle proteins, the nature of the protein is directly related to its location on the animal’s body, the age of the animal, the size of the animal, and the connective tissues present (Wandsnider 1997).

Lipids or fats are found in both plant and animal resources. They are composed of fatty acids and glycerol. The breakdown of lipids, like carbohydrates and proteins, makes food easier to digest. The breakdown of fats through lipid hydrolysis weakens the links between glycerol and fatty acid by introducing water molecules. The result of lipid hydrolysis is a more digestible food product. Heat treatment of fats has other advantages. Applying heat to fats can also make certain enzymes inactive, improving flavor and preparing them for storage. Fats can be used to reduce cooking time of other foods and improve flavor through the process of dispersion. Dispersion helps transfer heat more quickly and evenly throughout the food being cooked (Wandsnider 1997). Each type of food resource, those high in carbohydrates, fats, proteins, or a combination of the three will result in the need for different cooking techniques. Therefore, a variety of cooking facilities and utensils may be left behind in the archaeological record.
Resource Intensification and Expected Patterns of Cooking Technology Development

Multiple contemporary studies of cooking in prehistoric North America attempt to understand the relationship between the introduction of cooking technologies and changes in land-use patterns (Crawford 2011; Dering 1999; Milburn et al. 2009; Thoms 2003, 2008, 2009; Waechter and Andolina 2005; Yu 2006). Changes in environmental conditions and demographic shifts in these studies come into focus, often because of the introduction of previously underutilized or unused resources into the archaeological record. Resource exploitation and land-use patterns are terms that are sometimes used interchangeably and can be defined as the way in which humans utilize their surrounding landscape. This includes technologies employed in a given area and the effect of these land-use patterns on the ecosystem (Thoms 2003).

Referred to as resource intensification in California and the Great Basin, this phenomenon is similar to the term land-use intensification, which is used in areas such as the Great Plains, Texas, and Pacific Northwest literature. Land-use intensification has come to mean an increasing productivity achieved through changing cultural mechanisms and the way in which groups used the landscape and their subsequent effect on the ecosystem (Thoms 2003, 2008). Resource intensification has been used to mean an increase in productivity but at the expense of a declining overall foraging efficiency, where productivity is increased but so too is labor input (Broughton 1994, Butler and Campbell 2004). These two concepts do not need to be mutually exclusive (Butler and Campbell 2004). This study proposes that through the use of cultural mechanisms (cook-
stones), individuals were able to increase the productivity of the land but at the expense of increased processing and cooking times. This thesis will use the term resource intensification to mean an increase in productivity per unit of land, at the cost of increased cooking times.

Land-use patterns and resource intensification should not be discussed without a brief explanation of the origins of both terms. Both are rooted in human behavioral ecology, a line of study under the evolutionary ecology. Evolutionary ecology incorporates the study of evolution into an ecological context by utilizing strong theoretical and methodological practices (Smith and Winterhalder 2003; Winterhalder and Smith 1992). Human behavioral ecology takes this a step farther by applying methodology and theory grounded in evolutionary biology, anthropology, and economics to clarify “adaptive variation in human behavior, particularly social behavior” (Smith and Winterhalder 2003:377). Three main topics in human behavioral ecology are production, reproduction, and distribution. Very broadly, production includes topics related to resource acquisition, reproduction includes mating and child-rearing, and distribution includes trade and sharing. In order to study these topics, mathematical models are heavily utilized. (2003:378).

One such model based theory is optimal foraging theory. This theory looks at the ranking of resources through prey ranking or the prey choice model (Broughton 1994, Madsen and Schmitt 1998). “The prey choice model predicts that high-ranked prey will be taken whenever they are encountered while low-ranked prey may or may not be selected, depending on the abundance of high-ranked prey” (Broughton 1994:501). The
prey choice model typically places large game such as deer, elk, and pronghorn at the top of the ranking, while smaller animals such as rabbits rank much lower. Plant resources are occasionally factored into these models and tend to rank relatively low, often due to the time required for acquisition and processing of the plant. Basically, the model assumes that high-cost, low-ranked resources should not be taken unless low-cost, high-ranked resources are not available in order to sustain human populations (Broughton 1994). The two major trends often attributed to initiating resource intensification are increasing human populations and environmental changes (Broughton 1994; Thoms 2009; Waechter and Andolina 2005).

Resource intensification is often observed in the utilization of previously unused or relatively underutilized resources, especially one which requires increased processing times or labor input (Broughton 1994; Thoms 2003). There are many examples of this in California prehistory. One such example is the increased use of acorns after 4000 B.P. Acorns became one of the most important plant resources in California during that time (Basgall 1987; Hunt 2004). Methods of processing acorns and consumption of acorn products varied widely, though acorns were often cooked into gruel or baked in an earth oven for extended periods of time (Basgall 1987; Crawford 2011). Regardless of the methods employed, acorns represent a serious investment of time for acquisition, processing, and cooking. Basgall (1987) suggests that intensification of acorn use occurred, in spite of increased processing costs, due to the need to sustain increased populations.
Another relevant example from the Late Holocene is a study by Broughton (1994). Faunal evidence in the Sacramento Valley of California indicated a decline in the diet of medium and large mammals through time relative to small resident fishes. Broughton suggests that considerable decreases in foraging efficiency, or the net return rate of a specific foraging strategy, occurred during the Late Holocene in California. He postulates that this decrease in foraging efficiency is not related to technological innovations nor is it associated with environmental conditions, but possibly due to declines in more desirable prey availability due to hunting pressure (1994:510).

However, the introduction of new foods into the diet may also coincide with new cooking, collecting, or hunting technologies. Resource intensification can be studied through changes in behavior towards a technological adaptation. If a new technology is adopted, such as cook-stones, it should confer some sort of advantage to the user that previous technologies did not. Thoms (2009) identifies three important capabilities of hot-rock cooking technology. These include heat-retention capacity, fuel sparing potential, and steam or water boiling potential. Hot-rock cooking facilities would have been extremely useful for cooking items requiring prolonged periods of heat that cooking over hot coals simply could not have provided. It would have also allowed large amounts of food to be cooked at once, either for sustaining larger groups or for storage. The use of these features would have allowed previously unused or underexploited resources to enter the diet, which could not have been efficiently processed using previous cooking technologies. These facilities would have also been useful in fuel poor areas, such as
sagebrush steppe landscapes, since the hot-rocks would have retained heat longer than simple coals, maximizing the fuel output.

Another advantageous characteristic of the cook-stone is the ability to steam or boil food in both fuel rich and fuel poor environments. This would be especially useful for new plant based resources entering the diet, as well as for rehydrating foods. Providing this ability would increase the number and quantity of the resources that could be utilized and the number of cooking techniques available to the prehistoric chef. Thoms’ (2009) Working Model for Land-Use Intensification: Expected Temporal Patterns for the Use of Cook-Stone and Other Heating Elements for Cooking predicts an expected pattern for the development of cooking technology through time in North America.

The model predicts an expected progression of cooking feature types that change through time. As time passes and resource intensification increases, there should be a rise in cooking costs both in terms of increased labor and time invested, as well as an ensuing change in cooking technology. Following the model, the simplest and earliest method of cooking should be directly on or above coals. The next type of cooking facility to be added to the kitchen are subterranean rockless earth ovens. Cook-stone grills or flat-ovens are next, followed by subterranean rock-lined earth ovens. After these ovens are well established, stone boiling with non-ceramic containers and direct boiling with ceramic containers (where ceramics existed) are adapted. The following description of each type of cooking facilities or evidence of cooking activities as described below has

Fire Affected/Fire Cracked Rock

Fire cracked rock (FCR) is defined as rock which has cracked during the application of heat. Fire affected rock (FAR) is similar and is defined as rock affected by heat-treatment which may show signs of oxidation or other modifications. FCR and FAR are found in many of the cooking features described below and are modified as a result of the cooking process.

Direct Cooking

The direct cooking method involves cooking on, in, or above coals. It was likely the earliest form of cooking. Archaeologically, this cooking method might leave behind a layer of ash and charcoal, plant and faunal remains, and perhaps a shallow fire pit. This type of cooking can be difficult to distinguish from a fire for warmth, especially when plant and faunal remains do not preserve in the archaeological record. A rock ring could be used to retain heat and control the fire, which might also be left behind, however this may not always be present.

Grills and Flat-Ovens

A cook-stone grill is similar to a modern day griddle or frying pan. Cook-stone grills are made from one or more slab rocks on which a fire is built. Once heated properly, ash and charcoal are carefully swept away and the food is cooked directly on the rocks. Many things could be cooked on this type of stone grill. Ethnographically, the Washoe were known to use grills to cook small strips of fish, meat, and greens or to dry
berries for storage (Freed 1966). Greens requiring shorter cooking times were also cooked on these rocks for immediate consumption. This was typically done by steaming the food. The greens were placed on the hot rocks after the ash had been removed and water was sprinkled on top (Bloomer and Lindström 2006a).

A cook-stone grill might be surrounded by other rocks to help with heat retention or be placed near a large rock or boulder with a brush shelter over it. These grills were typically not used where extended heat was necessary. Remains of a grill might include ash, charcoal, FAR/FCR, and a shallow subterranean pit with flat or angular stones inside. Milburn et al. 2009 define grills in the Transverse Mountain Ranges in Southern California. They state that grills are similar to rock-lined earth ovens but “contain mostly single-course stone cooking platforms and relatively shallow unlined firing depressions, and apparently lack earthen mound baking enclosures” (Milburn et al. 2009:4). These features would produce substantially less heat than rock-lined ovens due to their shallow firing platform. Grills can be distinguished from ovens, in that ovens should be deeper and are more likely have an earthen or rock lid.

Ovens

Cooking in subterranean ovens is one of the more complicated cooking techniques examined in this study. The remains of these ovens often include a pit, which is dug below the surface of the ground and may or may not be lined with rocks. The ground below the pit is often oxidized, and ash and charcoal may be present inside the feature. Ovens are generally used in the following way. A fire is built inside the oven and allowed to reach a desired temperature before the charcoal and ash is swept out of the
oven. Food items are added to the oven at this time in the cooking process. Then an earthen or rock lid is usually placed on top of the food items to close the oven. A fire may then be lit on top of the lid for additional heat retention. Food is allowed to cook for a designated period of time before the lid is unsealed.

These features are excellent at maintaining heat for extended periods and can reduce the amount of fuel necessary to bake, roast, or steam. They will most likely be utilized where prolonged levels of heat are necessary or where foods need to be processed in bulk. Ovens explored in this thesis include the simple earth oven, rock-lined earth ovens, and rock-lined earth ovens with stones heated nearby.

A rockless earth oven is the most basic type of oven, and is constructed by digging a basin-shaped depression in the ground. According to Thoms (2009), these rockless earth ovens are likely to be the first type of oven to enter an area. Evidence of rockless earth ovens includes a depression in the ground and a nearby charcoal and ash concentration if the ovens have been cleaned out. However, these rockless earth ovens often preserve poorly in archaeological record due to their vulnerability to bioturbation.

Rock-lined ovens with rocks heated in situ (in place) contain a basin-shaped pit or depression with a layer or multiple layers of cook-stones. Within the study area these come in both larger and smaller sizes. Small rock-lined ovens range in size from slightly less than 50 to 100 cm in diameter, while larger rock-lined ovens measure from one to three meters in diameter.

Rock-lined ovens have been ethnographically documented in many locations as steaming, boiling, or roasting pits for food items requiring long cooking times, as well
as for bulk processing. These include food items like *Brodiaea* (a corm), acorns, camas, and sego lily, all of which require long cooking times to become edible (Crawford 2011; Lawrence 2009; Thoms 2009; Waechter and Andolina 2005). In addition, it has been documented that foodstuffs that would otherwise require short cooking times might be cooked in ovens for bulk processing. One such example is biscuit root (*Lomatium*), a carrot-like perennial herb which may cooked for short periods of time to be made edible. However, in the Plateau region of North America, archaeological evidence shows that biscuit root was often cooked in bulk in rock-lined ovens instead (Thoms 2009).

Rock-lined ovens can be fired by first placing cook-stones in a basin-shaped pit, then building a fire on top of the cook-stones. When the desired temperature of the oven was reached, ash and charcoal could be removed. At this time, food items often wrapped in some sort of protective vegetation layer would be placed on the hot-rocks. Then another layer of rock or an earthen lid was added to seal the oven. At this point the initial firing of the oven might be complete or a second fire could be lit on top of the lid. A second fire would help maintain the oven temperature for prolonged periods. Archaeological remains of these types of ovens include a basin-shaped pit with baked earth, a rock lining, and a lens of FCR/FAR intermixed with ash and charcoal, and any charred faunal or plant remains left. Nearby the oven there may be an ash/charcoal disposal area, where the contents of the oven was swept out and discarded. FAR and FCR used as the lid might be found in the oven, or nearby. In these types of cooking facilities, flakes and broken tools might be discarded in the oven as part of everyday cleanup of the site.
Another way in which rock-lined ovens were fired is with cook-stones heated nearby. Just like the previous method, a basin-shaped pit is first created. In this method, rocks are heated in a nearby fire. Using tongs, the pre-heated rocks are placed inside the pit. Food items are placed on top of the hot rocks to cook and this method was often used for steaming (Thoms 2009). Evidence of this type of oven includes a dugout pit with systematically lined cook-stones, FCR and FAR, but little to no charcoal or ash should be present.

**Stone Boiling**

Stone boiling can be done in a ceramic or tightly woven non-ceramic vessel. It can also be done directly in the ground. Ceramic vessels were not used within the study area so this method is not explored in depth. When stone boiling occurs in a non-ceramic container, cook-stones are heated in a nearby fire and placed directly into the container. When stone boiling occurs in the ground, cook-stones are heated nearby and a bucket-shaped subterranean pit is created. The pit is filled with water and the preheated cook-stones are placed within it. The water is heated to the appropriate temperature and the food is placed inside to be boiled. Archaeological evidence of stone boiling pits might include a dugout pit with a jumbled layer of FAR/FCR. Indications of stone boiling in woven vessels might only include a FAR/FCR concentration and a charcoal and ash lens where the rocks were heated. According to Thoms (2009) stone boiling is a more costly investment in terms of heat expenditure and labor exerted per calorie gained than pit cooking and should be the last cooking technique to enter an area.
Women and the Site Formation Process

When studying the art of cooking in prehistory, gender and gender roles become important. In their 1984 article, Conkey and Spector identified the need for an explicit framework for the study of gender in archaeology. They take issue with what they call archaeologists’ reliance on “androcentric ethnographies” and researchers’ own ethnocentric, culture-bound views (Conkey and Spector 1984:5). They state that these biases result in inaccurate portrayals of the past and assumptions about sexual divisions of labor, which may not actually be present in the past. They may also inaccurately inflate the value of male contributions to the group in relation to females.

When the article was first published, the few activities being attributed to women, such as gathering, cooking, and weaving were considered mostly invisible in the archaeological record. Conkey and Spector (1984) rightly questioned whether women were truly invisible in the archaeological record and suggested that evidence, not assumptions should be used to study and define any divisions of labor. In this sense, we should not assume that the sexual divisions of labor have remained constant throughout time. However, Conkey and Spector do not completely disregard ethnoarchaeology and the ethnographic analogy in archaeological work. They simply ask that archaeologists question their assumptions about human behavior in relation to gender. To deal with these issues they suggest that archaeologists working with gender issues use a strong theoretical and methodological background. With this, they put forth the task-differentiation framework. By using this framework, the authors state that archaeologists can reduce androcentric bias in their research, and that it is a way to be more sensitive to
the possibility of changes in the structure of human divisions of labor. The task-differentiation framework focuses on “four interrelated aspects of task performance: the social, temporal, spatial, and material dimensions of each task undertaken by a given group” (Conkey and Spector 1984:25). The first step in this framework is to identify tasks within the given cultural setting such as those associated with resource procurement and processing. Basically, the first step is to identify what task is being completed. In this case, cooking is the primary task in question.

Once tasks have been identified, the social dimension of task performance should be outlined. This includes who completed the task, how was it organized, and whether or not groups or individuals were utilized to complete the task. The social dimension helps identify the relationship, sex, and age of those performing the task. The next step is to identify the temporal dimension of the task. This includes seasonality of the task as well as duration. This information lets researchers understand how important the task was and what percentage of their lives people spent performing the task (Conkey and Spector 1984).

The next factor to identify is the spatial dimension. This dimension identifies within what context each task was accomplished. For example, some tasks might only take place within a house, while other tasks might be completed without as much spatial restriction. This can help identify differential mobility and the differences between the use of space by men and women, as well as how this use relates to the site formation process.
Finally, the material dimension of this framework identifies all the materials, facilities, and structures associated with a task. How these materials are used should be examined particularly by focusing on how they are produced, utilized, transformed, and discarded. Are these materials shared and do they serve multiple purposes, are two questions to be considered during this step (Conkey and Spector 1984). In this thesis the material dimension will be used to understand the construction method, and type of cooking features present in the archaeological record. Remains should be identifiable in the archaeological record based on ethnographic descriptions, previous archaeological evidence, and experimental reconstructions. Using the material dimension, this study will sort cooking features into functional types and attempt to identify construction methods of individual rock-lined ovens.

The following cooking feature types are drawn from descriptions in Thoms (2009) and Ellis (1997). They will be used in Chapter V: Data and Results to describe the cooking features in each site and to create Appendix A, a comprehensive list of features. The following list is a general set of parameters as to how these features will be defined:

- **Rockless earth ovens** will be considered to be present at a site when, basin-shaped pits are dug into the ground with few or no rocks present and the existence of burnt or oxidized earth. An ash/charcoal discard pile may be located in the feature or nearby.

- **Small rock-lined ovens** are considered present at the site when a basin-shaped pit (approximately 30 cm or more in depth) is lined with cobbles, which may be fire affected. The entire pit should measure one meter or less in diameter. The oven should
contain some evidence of a lid, which may be intact or nearby the rest of the feature. The oven may contain lithic material and broken tools which have been discarded as part of routine site cleanup.

- Large rock-lined ovens are considered present at a site when a basin-shaped pit (approximately 30 cm or more in depth) is lined with cobbles, which may be fire affected. The entire pit should measure over one meter diameter. The oven might contain some evidence of a lid, which may be intact or found nearby the feature. The oven may contain lithic material and broken tools which have been discarded as part of routine site cleanup.

- Grills and flat-ovens are considered present at a site when a flat or shallow pit (under 30 cm in depth), is lined rocks. Rocks may often be flat, but this will not always be the case. Other indicators of this facility type include being positioned near a large boulder for protection from wind. Lids will often not be present.

- Stone boiling generally occurred in pitch-lined baskets in the study area (Price 1980) and is more difficult to see in the archaeological record than other cooking methods. If boiling has occurred at the site, large areas of midden and burnt, oxidized soil and FAR/FCR not associated with a cooking feature are likely to be present. These collections of midden and FAR/FCR should only be considered suggestive of stone boiling, not a definitive indicator.

The bottom of rock-lined cooking features can indicate a lot about their method of construction. These are the areas of a feature that are most likely to stay intact, even after the oven’s lid is removed. More than one method might be used in a single oven,
especially in situations of repeated use of the same oven to cook different foodstuffs (Bloomer and Lindström 2006b:36-37; Ellis 1997:66-68). In order to look at oven construction techniques more carefully, the following parameters, first presented by Ellis (1997), will be used in Chapter V: Data and Results to define ovens more specifically:

- **Rocks are added first to the pit and a fire is built on top of them.** In this case, a neat and patterned alignment of rocks will line the bottom of the oven. Below the bottom of the rocks, the pit might show little evidence of burning or oxidation. However, this would not be the case in an oven fired repeatedly. Charcoal and ash would be present but most should have been removed.

- **Fire is added first to the pit and the rocks are placed on top.** In this case a heap or jumble of rocks, intermixed with charcoal would be observed at the bottom of the pit. Burnt or oxidized soil should be present under the rocks, because the fire was built directly on the soil.

- **Hot rocks are layered with foodstuffs.** In this type of construction, rocks are added to the bottom. Food and rocks are added in layers. The pit is covered and a fire is built on top. Heat is able to radiate down into the pit. Rocks which might be aligned carefully at the bottom of the pit but would be jumbled above it and charcoal would be mixed throughout.

- **Rocks heated elsewhere and then added to the pit.** This method of construction would leave behind a pit lined with rocks and an area of burned soil nearby where the rocks were heated in an outside fire.
Expectations

The rest of the task-differentiation framework will be utilized by this thesis to better understand cooking and the development of cooking technologies within the study area. The framework should help illuminate other phenomenon occurring such as changes in foodways, cooking system design, and changes in land-use and resource intensification. The material dimension of this framework has just been used to define how the structure and construction methods of these cooking facilities will be delineated in the Chapter V. The first thing an archaeologist sees in the archaeological record is evidence of the material dimension, so it becomes relevant to all other aspects of the framework. Utilizing the social, temporal, and spatial dimensions of the framework, five major expectations for this thesis were developed:

Social Dimension

Most simply put, the social dimension is who performed the task. A recent ethnographic study indicates that women were the primary food processors within the Washoe culture (Rucks 2012). Some plant collection related activities, such as the collection of pinyon, were group activities involving men, women, and children. Cooking at hunting camps was likely attributed to men (Kowta 1988). However, the overall ethnographic evidence indicates that women were the primary collectors of plant-based food, millers, and cooks. To date no evidence indicates that this was different during prehistoric times.

If cooking and other women’s activities are present at a site, this should be represented within the site’s design. Rucks (2012) found that bedrock milling stations are
located at the “heart” of camps and are important owned spaces (12). If this is the case with all kitchen features, I would expect to see milling, storage, and cooking features located prominently within a site. Beyond evidence of cooking features and bedrock milling stations, I also expect to see prevalent within these sites ground stone, cooking utensils such as tongs, and other cooking related tools such as fire drills. Finally, like the camas ovens of the Great Plains, I expect to see ovens located relatively near the resource being processed in them.

The social dimension can include not only who is completing the task but also who the task is being completed for, or the consumer. The following expectation also reflects on the ability of the material dimension to reveal information about the social contexts of cooking. The size of an oven may be able to reflect the needs of the consumer. Three large, rock-lined ovens were excavated at CA-PLU-1485. Twenty-three smaller rock-lined ovens were also excavated. The large ovens measured up to three meters in diameter and up to a meter deep. Waechter and Andolina (2005) propose that these large ovens represent the possibility of bulk processing for storage or cooking for multiple family units. They postulate the smaller rock-lined ovens (0.5 to one meter in diameter) were used for roasting or baking, but on a smaller scale.

Based on this information, if bulk processing is occurring either for storage or multiple family units, I expect to see larger rock-lined ovens (over one meter in diameter) present in sites. If cooks are processing food for smaller groups or individual families, I expect to see smaller rock-lined ovens (one meter or less in diameter) present in sites.
Temporal Dimension

The temporal dimension covers aspects of time, such as the duration and seasonality of the task. Changes in the temporal dimension can be quite telling. Waechter and Andolina (2005) and Thoms (2009) have postulated that an increase in cook-stone technology use, and therefore greater input of time spent processing food and cooking, is an indicator of resource intensification within the study area and much of the western United States.

Resource intensification may occur, especially when resources requiring longer, sustained cooking times enter the diet, in fuel poor areas where fuel efficiency is important, or where cooking for larger groups or bulk processing for storage is necessary. Lawrence (2009) and Waechter and Andolina (2005) cite that camas (*Camassia quamash*) was used ethnographically in the area and find that it entered the diet around 1000 B.P. They postulate that the introduction of this new food resource and therefore, cook-stone technology is an indicator of resource intensification.

If resource intensification is occurring in the study area, I expect to see several indicators, including an increase in the number of rock-lined ovens around 1000 B.P. I also expect to see previously underutilized resources such as camas being used more frequently around 1000 B.P. The switch to this more labor intensive form of cooking; with the requirements of digging pits, acquiring appropriate rocks, gathering fuel, and collecting and processing the plants, indicates that a larger percent of daily life is devoted to cooking and time spent in the kitchen. With this higher level of investment in building
cooking features and therefore in a site, I expect to see re-use of cooking facilities and cook-stones become common.

Thoms (2009) model postulates that the development of cook-stone features follows a basic progression through time, though older methods of cooking may still be employed where more efficient, convenient, or desired. This thesis suggests that consistent use of rock-lined ovens in northeastern California, as well as much of the western United States could be equally important marker of time as the development of the bow and arrow. The bow and arrow entered the Great Basin and California at varying times around 1000 years ago and is seen as a distinctive technological development, indicative of changes in hunting practices, subsistence patterns, and cultural transmission (Bettinger and Eerkens 1999). The entrance, spread, and intensive use of the rock-lined earth oven should be considered as an important technological development.

If Thoms (2009) Working Model for Land-Use Intensification: Expected Temporal Patterns for the Use of Cook-Stone and Other Heating Elements for Cooking is appropriate for the study area, I expect that the development of cooking features follows a clear pattern of development. Direct cooking should be the oldest method of cooking, followed by unlined earth ovens. Next, I expect to see flat-oven/grills and dispersed rock-lined ovens, becoming more tightly and carefully constructed through time. Use of rock-lined ovens and then stone boiling should be widespread in the later periods.

Spatial Dimension

The spatial dimension reflects on the context of the task, whether it was taking place in the public domain, domestic household, or private realm within a site. Rucks
(2012) found that bedrock milling stations were used in multiple social contexts: these include the domestic sphere for use by close kin, the public sphere for social and group use, and removed from the domestic sphere for private use (Rucks 2012:8). Larger features with multiple work stations are considered to be communal spaces where large gatherings might have taken place. Bedrock milling stations are fixed locations with permanent features. Rucks considers these to be owned and managed spaces, with most being domestic, female oriented work areas or kitchens. Multiple bedrock milling stations in large work areas signals that communal labor or large gatherings took place. Smaller bedrock milling stations with fewer milling surfaces indicates a single-user site.

Based on this information, it seems that multiple contemporaneously used cooking features should indicate communal use by cooks, whereas, singular or only a few cooking features indicate private or domestic use. Sites should be distinguishable as to whether they contain public/communal spaces from those with domestic spaces based on cooking features present at a site. If sites with communal spaces exist, I expect to see multiple contemporaneously utilized cooking features and if present, multiple bedrock milling stations. If sites contain domestic and private spaces, I expect to see only as single or few cooking features and bedrock milling stations.

Summary

This chapter considered foodways and cooking systems and how the entire process, from food acquisition to discard, is an important part of the archaeological record. Next, the reasons why the application of heat to food is beneficial were reviewed
in depth for various types of foodstuffs. These include increased digestibility, decreased chewing time, increased shelf life, and removal of toxins. Next, resource intensification and expected patterns of cooking technology development were discussed. Finally, the task-differentiation framework was discussed for studying gender in the archaeological record. In this section, the parameters by which each cooking feature will be sorted into a type and construction method were defined. Based on this framework and the aforementioned theories, a set of expectations for this study were developed. These expectations will be considered in depth in the final chapter.
CHAPTER III

PREHISTORY, ETHNOGRAPHY, AND COOKING IN THE WASHOE TERRITORY

This chapter begins with the earliest known use of hot-rock cooking technology in the world in the section entitled Hot-Rock Cooking: The Beginning. Focus then narrows to the study area and continues in sequential order from the earliest known inhabitants of the study area through to the Washoe. A brief overview of the currently utilized chronology is presented in the Prehistory section. How the traditional Washoe territory has been defined is explained in The Washoe and Their Homeland section. Next, the Subsistence and Social Organization section explores social organization as well as gathering, fishing, and hunting practices. Finally, in the Washoe Language, Milling, and Cooking section, the Washoe language as it relates to ethnographic foodways is investigated.

Hot-Rock Cooking: The Beginning

Hot-rock cooking is not a new technology, nor is it exclusive to North America. Some of the earliest known cook-stone features have been located in Europe. They date between 33,000 and 32,000 B.P. and are located in Abri Pataud, Les Eyzies, France. These cook-stone features are basin-shaped and measure approximately 1.5 m in
diameter. During the late Pleistocene, between 10,700 and 12,300 B.P., cook-stone features including slab and rock-lined basins are found at reindeer hunting sites at the Pincevent archaeological site, in central France. Evidence of hot-rock cooking enters the archaeological record around 10,000 B.P. in North America but FCR is rarely found at Pleistocene aged Paleo-Indian sites in the Great Plains (Thoms 2009). However, in Alaska the Moose Creek site, a small hearth containing FCR and measuring 50 cm in diameter was dated to 10,500 BP. To the south, a site on the coast of Oregon called the Indians Sands site contained a hearth with FCR dating to 10,430 BP. By 8000 B.P. hot-rock cooking is enters the San Gabriel Mountains in Southern California dates to around 8,000 years ago (Cable 1996; Milburn et al. 2009).

However, hot-rock cooking does not become pervasive in North America until around 4,000 B.P. Within the study area, this technological development aligns with the Late Spooner or Early Martis Phase. It is also around this time when hot-rock cooking appears in the study area at CA-PLU-1487/H. The site, located in Sierra Valley, California, contains a large rock-lined cooking feature of indeterminate nature that has a 2-sigma calibrated date range of 5455 to 5060 B.P. All other cooking features in this study post-date this time. By 1,000 B.P. there is a clear rise in the use of rock-lined cooking features across much of North America (Thoms 2009; Waechter and Andolina 2005).
Prehistory

The prehistory of the study area is complicated. The Tahoe Reach, Spooner, Martis, and Kings Beach phases are the foundation of a traditional chronology. This chronology is based primarily on projectile point typologies, upland versus lowland site locations, and toolstone materials utilized. This chronology has been criticized for being too broadly applied and needing refinement (King et al. 2004; Waechter and Andolina 2005). Work to develop a more accurate chronological representation of the study area is ongoing; however, for now the current chronology synthesizes what is known about the prehistory of the area. For reference purposes, this thesis will give a brief summary of this prehistoric background, though it is by no means comprehensive.

Tahoe Reach: Before 8000 B.P.

The Tahoe Reach Phase is poorly represented in the archaeological record. This phase occurred during the Early Holocene, a time where the climate was in a warming and drying trend. By about 10,000 B.P., the Sierran glaciers had started to retreat, making way for habitation of the Tahoe- Truckee Basin (Elston 1986). Artifact assemblages from CA-PLA-164 and the Last Super Cave in northwestern Nevada, to the east of the study area, include stemmed dart points, large bifaces, blades, and crescents (Waechter and Bloomer 2009). During this time, populations were low, residential mobility was likely high, and the pursuit of big game is thought to be an important part of subsistence, with less intensive processing and storage of plant materials (Bloomer and Lindström 2006a).
Spooner Phase (8000 to 5000 B.P.)

Like the Tahoe Reach, little archaeological data is available for the Spooner Phase. This phase lasted from about 8000 B.P. to the beginning of the Martis Tradition, at about 5000 B.P. This time period also coincides with the emergence of the Millingstone Horizon, where an increase in millingstones and handstones reflect the increased importance of seed and plant food processing (Kowta 1988; Waechter and Bloomer 2009). During this time, biface use is common. This period of time overlaps the Middle Holocene, which is characterized by a trend towards a drier and warmer climate. Lake Tahoe begins to shrink, glaciers retreat from the high Sierra, and charcoal grows more abundant, indicating an increase in the occurrence of fires (Elston 1986; Waechter and Bloomer 2009).

Martis Phase (5000 to 1300 B.P.)

The Martis Phase dates from approximately 5000 to 1300 B.P. which has been characterized by basalt toolstone artifact assemblages and high archaeological visibility. This includes increases in the frequency of houses, cooking, and cache pit features in the archaeological record (Hutchins and Simons 2000). It is during this time that cook-stone technology enters the study area. Based on larger house sizes found during this time period, it has been suggested that the individual household now included extended family members (Elston 1986).

Population levels were apparently rising and the archaeological record reveals an increase in overall site density. Sites are located predominately in upland locations on the edges of valleys, with large winter camps (Elston 1986; Heizer and Elasser 1953).
Bedrock milling stations begin to be utilized at base camps and large amounts of portable milling equipment are found both at these camps and at other locations, which include field camps and task sites (Elston 1986; Waechter and Bloomer 2009). Environmental conditions are said to have been wetter and cooler during this time period (Elston 1986; Kowta 1988).

**Kings Beach Phase and Washoe Continuum (1300 B.P. to Contact Period)**

The shift to the Kings Beach Phase in the eastern Sierra occurred simultaneously to the transition to the Late Archaic across the Great Basin. This period is marked by the introduction of the bow and arrow and elaboration and specialization of plant processing equipment such as mortars and hullers. House size appears to shrink and winter sites are utilized less extensively as the Kings Beach Phase progresses (Elston 1986).

During this time the west experiences the Medieval Climatic Anomaly (MCA) or multiple periods of extended drought and warmer conditions dating which occurred until around 500 years ago. The Early Kings Beach Phase (1300 to 700 B.P.) is delineated by the use of Rosegate and Gunther Series projectile points. By the Late Kings Beach Phase (700 to 150 B.P.), Desert Series projectile points are common (Elston 1986; Hutchins and Simons 2000; Moratto 2004). However, recent studies at CA-PLU-1485 have shown that Rose Spring points, part of the Rosegate Series persisted in Sierra Valley until at least 500 B.P., so utilizing this Early/Late Phase distinction based on projectile points is not flawless (Waechter and Andolina 2005).
The Kings Beach Phase has generally been attributed or linked to the ethnographic Washoe (Bloomer and Lindström 2006b; Elston 1986, 1971; Heizer and Elasser 1953; Kowta 1988). It has been argued that the Washoe are the direct decedents of the Kings Beach Phase based on their language and subsistence patterns (d’Azevdo 1986; Kowta 1988; Heizer and Elasser 1953; Price 1980). It has even been argued that Martis culture is also Washoe culture. Price (1980:2) states:

The evidence that the Washo have been isolated from the rest of the Hokan stock, the evidence of a King's Beach - historic Washo continuum, and the Washo oral traditions of long tenure open the suggestion that the Martis culture is ancient Washo culture.

However, he goes on to state that there is a sharp contrast between Martis and Kings Beach sites, which would need to be explained in order for this continuum to be feasible.

The Washoe and Their Homeland

The Washoe were among the last groups studied by ethnographers (Kowta 1988). A once fragmentary knowledge of the group is now being supplemented by the work of current ethnographers (Hammet et al. 2004; Price 1980, 1962; Rucks 1995, 2012). Due to their highly mobile nature, it was difficult for ethnographers to study the Washoe during and after the contact period. As with other California native groups, early and then later ethnographers such as Alfred Kroeber, Charles Royce, Edgar Siskin, Omer Stewart, Franklin Campbell, and Hart Merriam disputed where the Washoe territory boundaries should be drawn (d’Azevedo 1966).

In 1925, Kroeber omitted the southern portion of Honey Lake Valley from Washoe territory and gave the western side of Sierra Valley to the Maidu. Then, over
twenty-five years later, Kroeber changed his mind and excluded the Washoe entirely from Sierra Valley but extended their territory north to Honey Lake. On the other hand, Campbell, Merriam, and Siskin assigned the eastern side of Sierra Valley to the Washoe. Stewart and Warren d’Azevedo both strongly argue for control of the entirety of Sierra Valley by the Washoe (d’Azevedo 1966; Stewart 1966).

Stewart developed this conclusion after the 1955 Indian Claims Commission hearings on the subject. Evidence during these hearings came in testimony from elders of Washoe families who were able to describe detailed “geographic place names” and point out “ancient Washoe habitations sites” (d’Azevedo 1966:332). This assertion is supported by testimony of early European settlers in the area who claim to have met hundreds of Washoe when they first moved to Sierra Valley.

In spite of the original territorial dispute, most researchers now agree that Sierra Valley is no longer disputed as Washoe territory (d’Azevedo 1966; Stewart 1966; Kowta 1988). Maidu use of the valley, especially during the late 1800s around the Beckwourth, California area is also acknowledged. Territorial boundaries used in this thesis can be seen in Figure 1 in the first chapter.

Subsistence and Social Organization

Washoe social organization was fluid in comparison to neighboring groups and comprised of smaller core units that often changed with the season (Kowta 1988; Freed 1966; Wegener 2004). The “basic socio-cultural unit” was the household, which may have consisted of around seven to ten members. Up to 15 households might make up
a settlement. Larger groups camped together in winter villages might split up for the other seasons to acquire various resources (d’Azevedo 1986; Kowta 1988). Houses changed seasonally as well, in the summer a more simplistic dwelling was built, while winter required the construction of a more significant structure. Winter homes were often elliptical in shape and approximately 4 m in diameter and over 2.5 m in height (d’Azevedo 1986; Wegener 2004).

Washoe were known to follow a flexible seasonal round subsistence strategy (Elston 1979; Kowta 1988; Price 1962; Siskin 1938). As a part of this seasonal round, they occupied lower valleys during the winter where they subsisted on foods that had been dried and stored previously. Although the general tendency was to move from the low valleys in the winter to higher elevations in the summer, it was not uncommon for some members of the group to stay behind at year-round village sites (d’Azevedo 1986). During mild or dry winters, upland villages might have been used year round. Conversely, those villages might have been unused during summers when resources were scarce. This strategy would have allowed them to occupy places such as Sierra Valley, Dog Valley near Verdi, and the upper reaches of the Truckee River during these mild winters (Elston 1986; Bloomer and Lindström 2006a).

The Washoe gathered an assortment of fresh greens in spring, while roots, bulbs and seeds were harvested throughout both spring and summer. Mrs. Amy Barber, a Washoe elder, recalls cooking of fresh greens by her grandmother. In this case, she refers to Wadkša or Washoe spinach. She describes how Wadkša was cooked:
Dig a pit, line it with flat/same-size rocks and you need a couple of gunny sacks full of *Wadkša*-if you’re lucky, maybe three. Make a bonfire, build up rocks even on four sides, then, when it’s hot, take rocks out (not too hot-not red hot-layer on layer). Dampen *Wadkša*-put rocks in middle layers-then cover it up good-use tall grass [to cover it with] cover second cover of rocks-other *Wadkša*- over it-sprinkle warm water [on top] steam it-when done, make patties-dry it out in sun-use it in winter with soups (Bloomer and Lindström 2006a:31).

Bulb collection included camas, which could be harvested in March in the foothills of the Sierra Nevada. Various species of onion were gathered, roasted in pit ovens, and either formed into cakes for immediate consumption or storage. Potatoes were collected from the valleys and mountain areas. Bitterroot and sego lily were important root plants. Many seeds and grasses were also collected. Seeds to be collected included pigweed, sunflowers, wild mustard, and wild rye. Seeds with hard shells were processed using flat portable milling slabs and handstones. Other small or soft seeds might not need to be processed before cooking. Tule and cattail were important summer resources and were collected from marshy areas. The pollen of these plants was used either to sweeten other foods or mixed with water and baked in “sand pits” into cakes (d’Azevedo 1986:476).

The Washoe were known to eat acorns, and in some situations traded for them (Kowta 1988). The Washoe living in the north of the territory had the greatest access to acorns (d’Azevedo 1986). However, acorn use was restricted to the Sierra, where the resource was available (Lowie 1939). If the pine nut crop failed, the Washoe would have likely headed west and gathered acorns (Price 1962). Yet, because a trek west over the Sierran Crest was necessary to gather them, acorns were not a staple resource for many
Washoe groups. However, they would be readily available to those groups frequenting places like Sierra and Squaw Valleys (Bloomer and Lindström 2006a).

For many Washoe pine nuts were a far more important resource than acorns. Fall was a time of group gathering and collecting after the annual Pine Nut Dance, a ceremony held to this day (d’Azevedo 1986; Kowta 1988; The Washoe Cultural Office 2009). Both men and women participated in the collection (Price 1962). The men beat the trees with a hooked stick. Ripe pine nuts fell to the ground and were collected. They could be dried and stored in a pit for around a year (Lowie 1939). A unique characteristic of the Washoe is their ownership of pine nut groves. Ownership like this is considered a rare occurrence in the Great Basin (Price 1962). In good production years, storage of surplus in excess of winter needs occurred, which is another rare phenomenon.

Fishing also occurred year round. From spring to late summer, fish runs around Lake Tahoe were predictable and trout, suckers, and tui chub were all procured. Other major fisheries included Walker, Pyramid, and Honey Lakes and their surrounding tributaries. Ethnographic accounts state that large fish were placed directly on coals or pit roasted, while smaller fish and fish eggs were stone boiled in a basket, dried, or pit roasted. Bulk drying of surplus fish was undertaken by splitting open the fish, and then hanging it on a pole or from a tree. The process was sped up with the addition of smoke, which also repelled insects (d’Azevedo 1986:473).

The Washoe hunted for deer and mountain sheep, and organized rabbit and pronghorn drives (Freed 1966; Lowie 1939; Kowta 1988). Hunting for deer was typically done by a single hunter or a pair of hunters using a bow and arrow. Where a herd was
spotted, larger hunting parties might be assembled. In either case, hunting blinds constructed of rock, poles, and brush might be utilized. Mountain sheep were captured less frequently, but most commonly by individual hunters. Celebrations often occurred upon the return of a successful hunter. Pronghorn were not typically hunted by single individuals or small groups. Instead, large groups, sometimes including women would round up large numbers of pronghorn and drive them off a cliff, or more commonly into a “V-shaped” corral, where they would be slaughtered (d’Azevedo 1986:478). In upland areas the Washoe hunted waterfowl and upland birds (Freed 1966; Kowta 1988). Rabbits and hares were taken in organized drives, where large groups gathered and herded the animals into nets. They were killed with clubs or arrows. The rabbits or hares were then skinned and either boiled or roasted. Any surplus was dried and saved for winter (d’Azevedo 1986).

Washoe Language, Milling, and Cooking

The Washoe, whose language is also known as Washoe, are the only inhabitants of the Great Basin who do not speak a language in the Numic family. Washoe is not related to any other documented language groups nearby, making the language quite isolated. However, Washoe has been assigned to the Hokan language stock. It has been argued to be one of the oldest languages in the region (Jacobsen 1986; Kowta 1988; Price 1980).

Looking into the Washoe language might reveal more information about the foodways in the past. The use of ground stone as a milling implement and an important
kitchen utensil is fairly well documented among the Washoe and recent ethnographic work emphasizes the importance of millers (Rucks 1995, 2012). Milling and food processing are steps taken in order to prepare for the cooking stage. The terms discussed below were commonly recognized and utilized by Washoe elders who visited the excavations in Squaw Valley (Bloomer and Lindström 2006a), throughout the investigations at the Sugar Loaf Site, and also in the ethnographies conducted by Rucks (1995, 2012).

Habitation sites generally had permanent bedrock milling stations nearby for food processing (Freed 1966). Often these bedrock features are at the “heart” of the site (Rucks 2012:12). A recent ethnography identifies four genders or separate roles of millers; these include women, children, men, and shaman or doctors. Women are the “primary millers” Children, men and doctors are secondary or “occasional millers” (Rucks 2012:3). Milling features on bedrock should be considered important parts of the archaeological record since they remain in the exact position by their creators. Permanent bedrock milling features are called ‘lá:m in Washoe. These include mortars and other milling surfaces on bedrock and large boulders.

The social contexts that ‘lá:m are used in include: the domestic sphere for use by close kin, the public sphere for communal and group use, and removed from the domestic sphere for private use (Rucks 2012:8). Larger features with multiple work stations are considered to be communal spaces where large gatherings might have taken place. Not all smooth surfaces were constructed only for milling; staging areas were used
to keep utensils and food free of grit. Some of these larger milling slicks were considered “kitchen counters” and were used as a multipurpose station (Rucks 2012).

Rucks defines ‘lá:m, as owned and managed spaces, most being domestic, female oriented work or kitchen areas. She acknowledges that some ‘lá:m are created for spiritual purposes; to prepare medicine and complete other rituals. Multiple ‘lá:m in large work areas signals that communal labor or large gatherings took place. Smaller ‘lá:m with fewer milling surfaces indicate a single-user site. Deep bedrock mortars tend to be rare within the traditional Washoe territory. According to Rucks (2012) these mortars were often used not for food processing, but rather for medical purposes by a shaman.

On the other hand, démge’ refers to portable ground stone such as portable grinding slabs. Some of the démge’ which have been located in ovens and grills during the process of excavation may have had a purpose other than a simple, recycled cook-stone. These démge’ may have been utilized as “hotplates” or other cooking vessel (Waechter 2012). At many of the sites covered in this thesis, both fragmented and intact démge’ were located in cooking features during the excavation process.

Although very few anecdotal accounts of cooking have been recorded for the Washoe and most of these are recent, they still reveal important parts of the cooking process. Several words in the Washoe language which relate to cooking are discussed here. Mogieu refers to “roasting in the ground with rocks” according to a Washoe elder, Winona James (Bloomer and Lindström 2006a:31). In the case of smaller to mid-sized cooking features consisting of a few flat or slab shaped rocks, Washoe elder Ramona George Dick describes the cooking techniques she calls umselum. This technique
involves cooking on a hot-rock in a similar manner as one would use a griddle or frying pan. A fire would be built on top of the rocks until they were sufficiently heated. Then the ashes would be carefully removed and small strips of meat could be cooked on them. She can remember her grandparents using unselum for both cooking and drying (Bloomer and Lindström 2006a).

Another ethnographic description by Freed (1966) also supports this account. He stated that berries and greens could be dried on a flat rock for storage and could be rehydrated later through boiling. Freed also stated that “…dried fish could be cooked on a hot flat rock…” (77). Unselum are categorized as grills or flat-ovens by this thesis. These types of cooking facilities would often be positioned against a large rock and covered with a brush shelter or ga-du (Bloomer and Lindström 2006a:32).

Summary

This chapter began around 33,000 B.P. with some of the earliest known accounts of hot-rock cooking in the world. This section was followed by a brief overview of the prehistoric background and environmental fluctuations which have occurred in the study area over the last 10,000 years. Next, the Washoe territory and how it came to be delineated by ethnographers was discussed. An overview of Washoe social organization and subsistence practices including seasonal round patterns and food acquisition was given. Washoe language as it is relevant to the Washoe foodways, including recent ethnographic work done by Penny Rucks (1995, 2005) and relevant food-processing and cooking terms were discussed.
CHAPTER IV

SIERRA VALLEY AND THE
SUGAR LOAF SITE

In this chapter, attention is exclusively focused on part of the study area known as Sierra Valley, situated in far northeastern California. First, a brief outline of the environmental background of the valley is presented. Four previously excavated sites with documented cooking features comprise the discussion in the Previous Archaeological Investigations section. The core of this chapter will concentrate on a recently excavated archaeological site, known as the Sugar Loaf Site. The investigation of the Sugar Loaf Site was the major impetus for this thesis research and the following information has not been published elsewhere. Therefore, the site will be examined in quite some depth. Recordation, excavation, and post-fieldwork analysis of the site is detailed. The results of this work are explored. Finally, Washoe involvement at the site is discussed and several historic and modern disturbances to the Sugar Loaf Site are acknowledged.

Environment of Sierra Valley

Positioned at the north end of the Sierra Nevada mountain range, Sierra Valley is a high elevation basin that covers around 490 square kilometers. Waterways in the basin drain to the west by means of the Middle Fork of the Feather River. The valley
is part of the fault-block of the Sierra that splits near Lake Tahoe (Elston 1986; Wigand 2005). The valley floor reaches almost 1524 meters above sea level and the mountains that surround it range from 1829 to 2438 meters in elevation (Waechter and Andolina 2005). Average precipitation in the valley totals less than 50 cm per year, most of which falls as snow. Average air temperatures in July reach highs around 30° C and the average low temperature in January is -8.2° C (Western Regional Climate Center 2013b).

Three distinctive vegetative communities exist in Sierra Valley; grasslands, shrublands, and forests or woodland areas. Sedges and big sagebrush (*Artemisia tridentate*) dominate the valley floor. Jeffery pines (*Pinus jeffreyi*), California black oak (*Quercus kelloggii*), and aspen (*Populus tremuloides*) grow primarily on the slopes at the edges of the valley. Other native vegetation of significance in the valley include Great Basin wildrye (*Leymus cinereus*), Indian ricegrass (*Achnatherum hymenoides*), and a variety of bulbs, including camas (*Camassia quamash*). Wetlands contain cattails (*Typha latifolia*), rushes, and other important riparian species (Wigand 2005).

Before 11,000 years ago, Pleistocene Lake Beckwourth covered Sierra Valley. This shallow lake left behind a gently sloping basin floor. Soils in the valley are considered poorly to well-drained, depending on their location. Moist soils are common on the floor of the valley, while the surrounding upland areas are considerably drier. Soil moisture also decreases proportionately to declining rainfall from the west to east side of the basin. Alluvial fans and flood plains comprise the edges of the basin and surround waterways (Wigand 2005).
Currently, ranching and farming are the dominate industries in Sierra Valley. These and other historic activities such as logging have vastly changed the valley environment and landscape (Waechter and Andolina 2005, Wigand 2005). Still, the valley is productive and ecologically diverse. Today, the most dominate animal species in the valley are domestic cattle. Mule deer are commonly spotted in the valley and a variety of migratory birds nest here in the spring and pass through again in the fall. In the past, bighorn sheep (*Ovis canadensis*) roamed the mountains surrounding Sierra Valley.

**Previous Archaeological Investigations**

The earliest known prehistoric site in Sierra Valley is CA-PLU-1487/H. The oldest radiocarbon date from this site places the beginnings of occupation over 5000 years ago. Excavations within Sierra Valley have been relatively limited. Currently, only four sites, other than the Sugar Loaf Site have been excavated and contain cooking features. These sites are known as the Loyalton Rock Shelter, the Buttes Site, the Old Webber Gravel Pit, and CA-PLU-1487/H. A brief site description as well as information relevant to the cooking features recorded at each of the sites is described below. All cooking features with radiocarbon dates are listed in Table 1.

**CA-SIE-46/Loyalton Rock Shelter**

The first excavation in Sierra Valley was conducted at Loyalton Rock Shelter or CA-SIE-46 in the 1960s by Norm Wilson and the Nevada State Indian Museum (Wilson 1963). Loyalton Rock Shelter is located at the southern end of the valley. Soaring some 300 m above the valley floor, the rock shelter is located near the top of a
prominent geographic feature known as Elephants Head. This early excavation revealed 12 features that Wilson called fire hearths. These fire hearths were all 30.5 to 35.6 cm in diameter, basin-shaped, and contained ash lenses with charcoal. Each of the hearths was located between 7.6 and 22.9 cm below the surface of the deposit. Some of the hearths overlap, with only a small amount of midden deposit between them. The ash lenses all contained small pieces of charcoal and burnt bone. No FRC was located in the ash lenses and none of them contained rock rings (Wilson 1963). It is unclear if these hearth features were used as fire for warmth, direct cooking, earth ovens, or for some other purpose.

The artifact assemblage is comprised of a variety of projectile points, stone and bone tools, flakes, two charmstones, and an impressive amount of ground stone. These ground stone implements include fifteen battered handstones that Wilson divided into hammerstones and manos. It also includes 49 modified rock slabs, including what were interpreted as metates, anvil stones, and polished slabs (Wilson 1963). Wilson ultimately interpreted the site as a hunting campsite for bighorn sheep, with hide dressing being an important activity occurring at the site. He postulated that a secondary use of the site was as a stopping point for groups gathering plants on the slopes surrounding Elephants Head. Analysis on the faunal assemblage from the rock shelter collection is ongoing at the California State University, Chico Archaeology Laboratory.

CA-SIE-1059/Webber Gravel Pit

Another excavation in the southern end of the valley near Sierraville, California occurred at the Old Webber Gravel Pit or CA-SIE-1059. The site has been excavated on two occasions; the first excavation was conducted by Payen and Payen
This excavation revealed what was described as a concentration of fire cracked cobbles. The feature extended down 40 cm and is comprised of sub-angular rocks that range in size from 9 to 13 cm, except one that measured 20 cm in diameter. The feature contained charcoal throughout and extended into adjacent unexcavated units. Enough of the feature was exposed to indicate the diameter of the feature is around one meter. The feature contained three metate fragments, a basalt core, and a cobbler pounder or pestle.

The most recent excavation revealed three small rock-lined earth ovens, which returned radiocarbon dates ranging from 1050 B.P. to 690 B.P. (Lawrence 2009). Feature 1 is a small but deep rock-lined oven with a basin shape. It measures 44 cm in diameter and 55 cm in depth. The underlying soil is oxidized. A charcoal sample from the 30 to 40 cm level of the feature dates to 690 cal B.P. while a sample from the 40 to 55 cm level dates to 1050 B.P. The significance of these separate dates will be discussed in the Interpretation, Discussion, and Conclusion chapter. Feature 2 is another small but deep rock-lined oven, measuring 65 cm in diameter and 50 cm in depth. Again, the underlying soil is oxidized. Radiocarbon dating on a charcoal sample taken from the 40 to 50 cm level returned a date of 960 cal B.P.

Feature 3 is a much shallower rock-lined earth oven measuring 65 cm in diameter and 27 cm in depth. No dates are available for this feature and Lawrence (2009) suggests that its purpose was likely different than the other two features. The description of Feature 3 indicates that it falls into the category of grill or flat-oven. Very little faunal or botanical material was recovered from any of these features. Camas was absent and the majority of the remains were identified as juniper berries, which may have been the result
of the presence of an old growth juniper tree located in close proximity to the cooking area.

**CA-PLU-1485/The Buttes Site**

One of the most unique sites in this study is referred to as the Buttes Site or CA-PLU-1485. This site is located under what is now Highway 70. It was excavated by Far Western Anthropological Research Group, Inc. in 1999. Excavations revealed some of the most substantial results regarding numbers of cooking features in Sierra Valley, as well as the entire region. Fifty-seven features were uncovered in total, twenty three of which were small rock-lined basins (less than 100 cm in diameter) many with charcoal staining, as well as three larger earth ovens (over 100 cm in diameter). Overall, seven features were dated and almost all returned radiocarbon dates between 1050 and 600 B.P. This is a surprisingly narrow time frame which as Waechter and Andolina (2005) point out, falls within the Medieval Climatic Anomaly.

Botanical analysis indicated a general lack of seeds in these ovens, although evidence of camas, *Brodiaea*, and some small seeds were present. In the large ovens, camas, including burnt bulbs, was considered the most significant finding. Small seeds were absent with the exception of *Phacelia* seeds. According to Wohlgemuth (2005) these seeds were not eaten ethnographically by the Washoe, but were by other Great Basin groups. He theorizes that if the seeds were not being eaten, it is possible that the *Phacelia* leaves were used to wrap bulbs in the large ovens to protect them from burning. In the smaller cooking features there is more variability in terms of botanical remains
recovered. Small seeds and nuts were rare, but present in these cooking features. *Brodiaea* bulbs were also present in the smaller ovens.

**CA-PLU-1487/H**

The oldest site excavated to date in Sierra Valley is CA-PLU-1487/H (Waechter and Mikesell 2002). This relatively small habitation site is located to the west of the Buttes Site, near Highway 70. During excavation, three rock-lined cooking features (Features 1, 2, and 3) were uncovered. Feature 1 is the oldest of the features and returned a conventional date of 4590 ± 50 B.P. or 2-sigma calibrated date of 5455-5060 B.P. The feature measures about 1.4 m in diameter and approximately double that in width. Waechter and Mikesell (2002) postulate the large size of Feature 1 may represent a single cooking feature or several structures which have collapsed together through time. The exact purpose and method of construction is unknown and the feature is described as being a dispersed collection of FCR and milling equipment. Soil beneath the feature is oxidized. Associated artifacts identified include four bifaces, four flake tools, two hammerstones, four handstones, five millingstone fragments, and one pestle. It also contains 159 bitterbrush seeds, one goosefoot, three sunflower, two Poaceae or grass seeds, and eight unidentified seed fragments.

Feature 2 is not dated but measures 100 cm in diameter. It is associated with one handstone, seven flakes, two unidentified burnt seeds, and two possible fish bones. The feature has not been fully excavated and was left intact and reburied. This feature has a distinctive “dish shape” and is described as a lens with FAR. The exact method of construction of this oven is not readily apparent and neither is its type.
Feature 3 dates to 3825 to 4075 cal B.P. It measures about 90 cm in diameter. No depth measurement is available, but it appears to be a small, shallow rock-lined oven or grill. It contained 50 bitterbrush seeds, one hairgrass, one acorn, one goosefoot, two Poaceae, and seven unidentified burnt seeds. It is also associated with four handstones, four millingstones, one hammerstone, one drill, one lemon-shaped charmstone, and 17 pieces of debitage (Waechter and Mikesell 2002).

**Table 1. All Cook-Stone Features with Radiocarbon Dates in Sierra Valley, Including Sugar Loaf Site**

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Cooking Feature Number</th>
<th>Radiocarbon Date(s) Conventional &amp; Calibrated</th>
<th>Diameter (cm)</th>
<th>Depth (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar Loaf Site (this thesis)</td>
<td>10</td>
<td>1430 ± 30 B.P./ 1370 to 1290 cal B.P.</td>
<td>100 x 120</td>
<td>-</td>
</tr>
<tr>
<td>The Old Webber Gravel Pit (Lawrence 2009)</td>
<td>1</td>
<td>1050 cal B.P. at 40 to 55 cm and 690 cal B.P. at 30-40cm</td>
<td>44</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>960 cal B.P. at 40 to 50 cm</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>The Buttes Site/ CA-PLA-1485 (Waechter and Andolina 2005)</td>
<td>1</td>
<td>2580 ± 40/2740 cal B.P.</td>
<td>80</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>500 ± 70/525 cal B.P.</td>
<td>85</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>490 cal B.P. and 570/580/640 cal B.P. 740 ± 60/670 cal B.P.</td>
<td>250 x300</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>670 ± 60/650 cal B.P.</td>
<td>280 x 190</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>810 ± 70/710 cal B.P.</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>670 ± 40/650 cal B.P.</td>
<td>75 x 79</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>640 ± 70 and 1070 ± 60/640 and 960 cal B.P.</td>
<td>160 x 170</td>
<td>50</td>
</tr>
<tr>
<td>CA-PLU-1487/H (Waechter and Mikesell 2002)</td>
<td>1</td>
<td>4590 ± 50 B.P./ 5455 to 5060 cal B.P.</td>
<td>140 cm wide by about twice as wide</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3610 ± 50 B.P./ 3825 to 4075 cal B.P.</td>
<td>~90</td>
<td>-</td>
</tr>
</tbody>
</table>
Sugar Loaf Site

Named for a prominent nearby geographic feature, the Sugar Loaf Site is relatively small, covering just over three acres. Located at the north end of Sierra Valley, California the site is just one mile north of Highway 70 and the Buttes Site. The Sugar Loaf Site first became known to the Bureau of Land Management (BLM) during a grazing allotment survey in 2007. BLM archaeologist Sharynn Blood observed that a prehistoric site had been impacted by a recent road improvement on a BLM parcel, leading to a nearby gravel pit on private land. In addition to recording lithic material and bedrock milling features, she noted a large amount of midden eroding out of the road cut and in a nearby bulldozer push-pile, the results of road construction.

Later that year, a Native American monitor and Washoe elder named Anne Eldred, identified a feature in the midden. She believed the feature was the remains of a “hearth” (Sharynn Blood, personal communication 2012). The site was formally recorded by Western Cultural Resource Management (WCRM), Inc. in 2007 (Sigler et al. 2008) and again in 2012 by California State University, Chico’s Advanced Archaeological Field Class.

Sigler et al. (2008) reported fourteen other prehistoric sites on the 315 acres of private land adjacent to the Sugar Loaf Site. These sites include lithic scatters and sites containing bedrock milling stations. According to a record search at the Northeast Information Center (NEIC), no other sites are recorded within one mile of Sugar Loaf. However, site density indicates that this area was important prehistorically and soils in the area make subsurface deposits at nearby sites likely.
Vegetation at the Sugar Loaf site was identified by the Bureau of Land Management, Eagle Lake Field Office ecologist, Valda Lockie in 2013. Ethnographically important plants were documented; they can be found in Appendix B (Valda Lockie, personal communication 2013). In total, about 32 percent or ten of the 32 plants identified in or in the immediate surroundings of the site are known to be ethnographically important plants to the Washoe and were used for food, medicine, and raw materials (The Washoe Cultural Office 2009). However, five of the species listed are invasive. Excluding these plants, closer to 37 percent of the plants in the site are known to be ethnographically or prehistorically important. Like much of the rest of Sierra Valley, heavy historic grazing practices in the area surrounding the Sugar Loaf Site have probably changed the plant communities present today.

Excavation

In 2012, the site was recorded as part of work done by the California State University, Chico Advanced Archaeological Field Methods class. The recordation utilized a combination of equipment including multiple Trimble GeoXM GPS units, a Leica total station, and multiple sketch maps and drawings. A sketch map of the site can be found in Appendix C. Excavation took place in late May and early June 2012 as a joint effort between California State University, Chico and the BLM. A total of three excavation units were placed within the site. The units were selected in three ways. One unit was selected using a simple random sample. The site was gridded and numbered using ArcGIS software and a random number generator was used to select a one meter square (Unit 43S, 13E). Another unit was chosen the same way but using a stratified
random sample and areas of known surface density were targeted. From these areas a unit was selected randomly (Unit 8N, 5E). These two units were 1-x-1-m in size. The final unit, a 2-x-2-m unit was placed directly over the eroding cooking feature in the road. A larger unit was utilized in order to capture the entirety of the feature. A soil sample was taken from the cooking feature for flotation analysis and multiple charcoal samples were collected from all the units for AMS radiocarbon dating. Results of these analyses will be discussed below.

Artifact Assemblage

Artifacts have been collected from the site in a professional capacity on two occasions. The first collection was of surface artifacts during initial recording by WCRM in 2007. This collection includes a mano fragment, a core, an angular abrader, a basalt projectile point base, a projectile point or drill tip, a basalt projectile point tip, and a gray chert Rosegate point base (Sigler et al. 2008). The second collection occurred during the excavation in June 2012. The artifact assemblage consists of around 700 flakes and other debitage, the majority of which have been identified as interior flakes. Six bifaces, a complete basalt Elko Corner Notched projectile point, and one obsidian corner notched projectile point fragment were recovered from within the excavation units.

The main lithic material present at the site is fine grained vesicular basalt, although a variety of cryptocrystalline silicate and obsidian are also present. A total of 13 pieces of ground stone were recovered, six of which were located in the cooking feature (Feature 10) and are fire affected. One piece of ground stone was identified by a tribal elder from the Washoe Tribe of Nevada and California as démge’. The Washoe elders
indicated that démge’ are personal items, often broken upon a women’s death to prevent use by others. This démge’ was originally located in Feature 10 and is fractured. No botanical remains were recovered during excavation and one bone fragment identified only as medium or large mammal was recovered.

After the excavation was over, a unique donut shaped stone was located. This artifact, pictured in Figure 2, was found lodged in the crevice of a boulder containing cupules (Feature 1d). The stone measures just over 5 cm in diameter by 2.5 cm in thickness. Interestingly, it is incised around the outer edge. Other “donut-stones” have been found all around the West, though a definitive purpose has not always been identified. These donut-stones can vary quite a bit morphologically. Multiple uses have been suggested for such artifacts, including as a ceremonial instrument, fishing weight sinker, pendant, or a digging stick weight (Adams 2002, Tuohy 1986). Somewhat outside the traditional Washoe territory, in Humboldt Valley, numerous similarly shaped and

![Figure 2. Donut-stone found at the Sugar Loaf Site.](image)
sized stone disks with various decorations and incisions have been located (Heizer 1974). No concrete purpose for these disks or donut-stones has been determined though they have been compared to those found in Bowers Cave in Los Angeles County (Elasser et al. 1963).

Another possible use could have been as part of a pump fire drill.

Ethnographically, the fire drill was an important tool for starting fires (Kowta 1988; Lowie 1939). The Advisory Council for The Washoe Tribe of Nevada and California has suggested that the donut-stone might be part of a “fire starter or drill” (Darrel Cruz, personal communication 2013). It is quite possible that it could have been used as a flywheel for a fire pump drill (Tuohy 1986:236-237).

Features

The site contains a total of no less than 12 features. These include bedrock milling stations, a small rock shelter, a rock-lined flat oven or grill, and a cluster of unburnt stone. Features 1 through 9 are bedrock milling stations. Feature 10 is a rock-lined cooking feature discussed in-depth below. Feature 11 is a small rock shelter, which appears to contain some subsurface deposits as well as charcoal staining. Feature 12 is a cluster of unburnt stone, located at the bottom of unit 8N, 5E.

Features 1 through 9 comprise a total of 36 individual milling surfaces most of which are milling slicks and shallow mortars. The majority of these features are less than 4 cm in depth. Feature 1 is comprised of four separate boulders with multiple milling stations. On one of these boulders is Feature 1d, which contains eight cupules. Cupules are an interesting form of rock modification, sometimes ascribed utilitarian purposes, but
often considered to be rock art. Cupules can be found throughout the world and are sometimes thought to have spiritual or religious meaning. They are circular depressions, which have been ground or pecked into a stone surface or boulder (Bednarik 2008). Interestingly, the donuts-stone was located in the crevice of Feature 1d.

The deepest mortar recorded in the site is, Feature 6a. This feature is located at the northern portion of the site and is 14.4 cm deep. Feature 7 is also worth noting. This conical mortar is located within a large, naturally eroded basin on a granite boulder. The mortar measures 3.5 cm in diameter and 1.75 cm in depth. Two other naturally eroded basins are located above. This feature was affectionately referred to during the investigation as “The Face” and is pictured in Figure 3.

![Figure 3. Feature 7, a conical mortar located within a large natural basin on a granite boulder.](image)
Feature 12 is a rock cluster that was located during excavation at the bottom of unit 8N, 5E and is pictures in Figure 4. It was only partially excavated and contained at least 20 rocks; most appear not to be fire affected. One piece of ground stone was removed and collected from this feature and may be fire affected. This feature might have served as a collection of cook-stones for stone boiling or for use in future ovens. Charcoal was apparent in the unit levels above the feature but lessened at the close of the unit. One charcoal sample was taken for radiocarbon dating from just above the feature, results are listed below.

![Feature 12](image)

Figure 4. *Feature 12, a cluster of mostly unburnt stone.*

Feature 10

One rock-lined cooking feature, Feature 10, was excavated from within the existing roadbed and is depicted in Figure 5. Feature 10 measured 100 x 120 cm and was
essentially flat, with no apparent basin shape. It rested on decomposing granitic bedrock, pictured in Figure 6, which has been affected by heat. The soil between the feature and the bedrock was oxidized and contained an abundance of charcoal. It was hard to determine the exact morphology and dimensions of the feature before disturbance by road building activities. However, it appears to be the remains of a grill or flat-oven, as defined in Chapter II. The flat-oven is large in terms of diameter but may have been more compact prior to disturbance. Adjacent to the feature are several clusters of FAR/FCR and unburnt stone which may have served as cook-stones for the grill or other potential nearby cooking features.

Figure 5. Feature 10 during excavation.
Within the feature there was an abundance of FCR and charcoal. All FCR/FAR in and around Feature 10 was weighed and measured and is represented in Table 2. A total of 338 FAR/FCRs were removed from in and around the feature. A total of 126 kg of FCR/FAR was removed from within Feature 10. A total of 16 kg was removed around the feature.

### Table 2. Fire Cracked/Fire Affected Rock and ground stone from Feature 10

<table>
<thead>
<tr>
<th>Size (N=Number of FCR/FAR)</th>
<th>Total Weight (kg)</th>
<th>Ground Stone Fragments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 -10 cm</td>
<td>&gt;10 cm</td>
<td>Total</td>
</tr>
<tr>
<td>Within Feature 10</td>
<td>n = 76</td>
<td>n = 30</td>
</tr>
<tr>
<td>Area Surrounding Feature 10</td>
<td>n = 262</td>
<td>n = 15</td>
</tr>
<tr>
<td>Total</td>
<td>n = 338</td>
<td>n = 45</td>
</tr>
</tbody>
</table>
During the process of excavation, 26 interior flakes, mostly basalt were recovered from within the feature. Significantly more were located within the 2-x-2-m unit placed around the feature. Artifacts recovered from the immediate vicinity of the feature include four biface fragments and an obsidian corner-notched projectile point fragment, which according to Thoms (2009) could represent routine cleanup of the cooking area and surrounding site.

**Radiocarbon Dating**

AMS Radiocarbon dating was conducted by Beta Analytic on three samples from the Sugar Loaf Site; results are listed in Appendix D. One of these samples was collected from within Feature 10. This sample returned a conventional date of 1430 B.P. and a calibrated 2-sigma range of 1370 to 1290 B.P. This places the age of Feature 10 in the time period just before or immediately at the transition from Martis to Early Kings Beach phases and at the beginning of the Medieval Climatic Anomaly. The charcoal sample from unit 43S, 13E was not associated with a feature but was adjacent to a basalt Elko Corner Notched projectile point. The sample taken from the 10 to 20 cm level dates to 310 to 280 and 170 to 150 cal B.P. The charcoal sample from the 20 to 30 cm level of unit 8N, 5E was recovered just above Feature 12. This sample returned calibrated date ranges of 270 to 220 and 140 to 20 B.P. or to modern times.

**Flotation**

Flotation was completed in February 2012 at the California State University, Chico Archaeological Research Laboratory. Materials used for flotation included three five-gallon buckets, clamps, a fine mesh screen, and nylon stockings. There were a total
of three soil samples collected from the site, all from Feature 10. The first step was to line each of the five-gallon buckets with a screen and secure it using clamps. Next, half of each sample was dumped into a prepared bucket. Using a garden hose, water was poured gently over the samples until the buckets were three-quarters full, using 3.25 gallons of water each. The dirt was massaged by hand with the intent to get the light fraction to float and the heavy fraction sink. Then, the first collection of the light fraction was undertaken. The water was poured into the stockings until the bucket was nearly empty. The bucket was refilled with about 3.25 gallons of water. This process was repeated three times for each half sample and six separate flotation rounds were completed.

Unsurprisingly, flotation did not reveal an abundance of seeds or bulbs. In fact, no bulbs were present within the cooking feature and none were found during excavation. Only one seed was recovered from the entire sample. This small seed compares favorably to Poacea, a general family of grasses. An abundance of charcoal was present in both the light and heavy fractions. Multiple basalt, cryptocrystalline silicate, obsidian flakes, and shatter were recovered from the heavy fraction of the sample.

Washoe Involvement

Washoe involvement was an important part of the identification, excavation, and research processes. As previously mentioned, Feature 10 was initially identified in 2007 as a potential hearth by a Washoe elder Anne Eldred. This discovery prompted the subsequent recordation and excavation efforts. Input was requested for the use of the donut-shaped ground stone found in a crevice of one of the bedrock milling features at
the site and several possible uses were provided. Multiple site visits from the Susanville Indian Rancheria, Reno-Sparks Indian Colony, and the Cultural Committee of the Washoe Tribe of Nevada and California also occurred from 2007 to 2013, throughout the entirety of the investigation process. All input given was sincerely appreciated.

Disturbances at the Site

Multiple disturbances have affected the Sugar Loaf Site. The most obvious of these is a wide bulldozer bladed road that bisects the site. This road revealed midden, Feature 10, and an abundance of fire-cracked rock. Auger testing throughout the rest of the site revealed up to 60 cm of soil has been lost from the subsurface deposits in the road. This makes it difficult to understand the original nature of the cooking feature. Use of heavy machinery to access an adjacent gravel pit on private land has also compacted soils in the road. Grazing and cattle impacts are apparent throughout the site, especially under the large Jeffery pine tree located centrally in the site. Trampling and trailing have affected various other parts of the site to differing degrees. As a result the BLM constructed a fence around the site to exclude cattle in 2013.

Finally, unauthorized collection at the site is readily apparent. In fact, the site record by WCRM states that the site is a favorite location for local collectors with rakes and screens (Sigler et al. 2008). Several collectors’ piles have been noted during various trips to the site. This indicates that the surface artifact assemblage was likely much more robust at one time, and that subsurface looting is also likely. Still, auger testing has revealed that large portions of the subsurface deposit remain intact, which indicates there is a possibility more cooking features might be present.
Summary

This chapter began with an overview of Sierra Valley, California which included the environmental background and previous archaeological investigations of sites with cooking features. Then the recent recordation, excavation, and post-fieldwork analysis at the Sugar Loaf Site were detailed. AMS Radiocarbon dating by Beta Analytic returned a 2-sigma calibrated date range of 1370 to 1290 B.P., placing the age of the cooking feature during the transition from the Martis to Kings Beach Phase and near the beginning of the Medieval Climatic Anomaly, certainly a time of important environmental and cultural change. Washoe involvement in the investigation process was discussed. Finally, the chapter concluded with disturbances to the Sugar Loaf Site and how they may have affected the subsurface deposits there.
CHAPTER V

COOKING IN THE EASTERN SIERRA:
DATA AND RESULTS

In this chapter we venture out from Sierra Valley to examine cooking in the entirety of the study area, concentrating on the other 17 sites containing cooking features. First, the general research methods used to acquire this data are reviewed. Next, each of the sites and associated cooking features are discussed. This chapter utilizes the cooking feature type and construction methods outlined in Chapter II of this thesis to better understand and quantify cooking features within the entire study area. In addition to feature construction methods and types, faunal and botanical remains, and associated artifacts recovered from cooking features across the study area are reported in the Data section. In the Results section, this data is compiled to see if any trends are apparent across the entire study area.

Overall Research Methods

Record searches at the Northeastern Information Center (NEIC), Nevada Cultural Resources Information System (NVCRIS) online database, the Nevada State Museum (NSM), and a search of Special Collections at the University of Nevada, Reno (UNR) Library were undertaken. This was done in order to try to identify as many prehistoric sites as possible that had been excavated within the study area and contained
cooking features. Descriptions of these features often included hearths, fire hearths, rock-lined ovens, earth ovens, roasting pits, and ash lens.

The search area was limited to the traditional Washoe core and periphery use areas. While this study recognizes that tribal boundaries likely fluctuated throughout time, some geographic parameters must be used to limit the data considered in this thesis. In this case, since there appears to be continuity from the modern Washoe back to the Early Kings Beach Phase, if not earlier, the traditional Washoe boundary seems to be a logical boundary. In addition to the NEIC, NVCRIS, NSM, and UNR research, other avenues to acquire data were investigated. This included a dialog with the U.S. Forest Service, Bureau of Land Management, and private firm archaeologists, as well as Penny Rucks, an ethnographer with expertise in the Sierra Valley, Truckee, and Tahoe areas.

When collecting data about the features this researcher attempted to record the feature number, description, dimensions (diameter and depth), age, botanical and faunal remains, and cultural contents or artifacts. This data was used to categorize the features by type, size, and method of construction. Other information collected included other associated features such as house pits, bedrock milling stations, cache pits, and burials. Additionally, the scale of the excavation was noted when analyzing reports as this reflects on how much of the site remains intact, and therefore on whether additional cooking features that might exist.

As outlined in Chapter II, feature types and size include direct cooking, rockless earth ovens, small rock-lined ovens, large rock-lined ovens, flat-ovens/grills, and stone boiling. Where a clear feature type could not be determined, the feature is listed as
“indeterminate”, and where possible, a feature type is suggested. Construction methods for rock-lined features include those first suggested by Ellis (1997). The first of the four is rocks added initially to a pit and a fire is built on top of them. In this case, a neat and patterned alignment of rocks will line the bottom of the oven. The second construction method is fire added first to the pit and the rocks are placed on top. In this case a heap or jumble of rocks, intermixed with charcoal would be observed at the bottom of the pit.

The third construction method is hot rocks layered with foodstuffs. In this type of construction, rocks are added to the bottom of the earthen pit. Food and rocks are added in layers. Rocks which might be aligned carefully at the bottom of the pit but would be jumbled above it and charcoal would be mixed throughout. The final method starts with rocks heated elsewhere and then added to the pit. This method of construction would leave behind a pit lined with rocks and an area of burned soil nearby. All data including these feature types and construction methods are listed in Appendix A.

Data

The above research tactics allowed me to acquire 19 reports which detail 22 sites, including the Sierra Valley sites listed in the previous chapter. A total of 142 cooking features were located, though more were described to be present but unrecorded or unexcavated at many sites. Information on CA-PLU-250 was acquired through personal communication with Mary Kliejunas, District Archaeologist on the Beckwourth Ranger District of the Plumas National Forest. A report on the excavation is in progress. All sites in this study are listed in Table 3 and described below.
Table 3. List of Sites with Cooking Features in Study Area

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Location</th>
<th># of Cooking Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-NEV-13/H</td>
<td>Donner Lake</td>
<td>2</td>
</tr>
<tr>
<td>CA-PLA-5</td>
<td>Martis Valley</td>
<td>1</td>
</tr>
<tr>
<td>CA-PLA-163</td>
<td>Squaw Valley</td>
<td>1</td>
</tr>
<tr>
<td>CA-PLA-165</td>
<td>Squaw Valley</td>
<td>6</td>
</tr>
<tr>
<td>CA-PLU-44/Chilcoot Rock Shelter</td>
<td>Plumas County</td>
<td>2</td>
</tr>
<tr>
<td>CA-PLU-130</td>
<td>Mohawk Valley</td>
<td>3</td>
</tr>
<tr>
<td>CA-PLU-226</td>
<td>Mohawk Valley</td>
<td>1</td>
</tr>
<tr>
<td>CA-PLU-250</td>
<td>Mohawk Valley</td>
<td>1</td>
</tr>
<tr>
<td>CA-PLU-1485/The Buttes</td>
<td>Sierra Valley</td>
<td>26</td>
</tr>
<tr>
<td>CA-PLU-1487/H</td>
<td>Sierra Valley</td>
<td>3</td>
</tr>
<tr>
<td>Sugar Loaf</td>
<td>Sierra Valley</td>
<td>1</td>
</tr>
<tr>
<td>CA-SIE-46/Loyalton Rock Shelter</td>
<td>Sierra Valley</td>
<td>12</td>
</tr>
<tr>
<td>CA-SIE-47</td>
<td>Stampede Reservoir</td>
<td>4</td>
</tr>
<tr>
<td>CA-SIE-1059/Webber Gravel Pit</td>
<td>Sierra Valley</td>
<td>4</td>
</tr>
<tr>
<td>26D037/Daphne Creek Site</td>
<td>Daphne Creek</td>
<td>5</td>
</tr>
<tr>
<td>26Wa1696</td>
<td>Truckee Meadow, NV</td>
<td>1</td>
</tr>
<tr>
<td>26Wa1697</td>
<td>Truckee Meadow, NV</td>
<td>22</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Thomas Creek, NV</td>
<td>20</td>
</tr>
<tr>
<td>26Wa6872</td>
<td>Hungry Valley Site, NV</td>
<td>1</td>
</tr>
<tr>
<td>26Wa1676</td>
<td>Bordertown</td>
<td>16</td>
</tr>
<tr>
<td>26Wa2065 Glendale Site</td>
<td>Truckee River</td>
<td>7</td>
</tr>
<tr>
<td>26Wa3017 Vista Site</td>
<td>Reno, NV</td>
<td>3</td>
</tr>
</tbody>
</table>

CA-NEV-13/H

CA-NEV-123/H (Bloomer and Lindström 2006b; Bloomer and Jaffke 2009) is a large, multicomponent site covering some 60 acres in the vicinity of Donner Lake in the Truckee, California area. Limited testing was conducted in 2004 and data recovery proceeded in 2005. The site was occupied both prehistorically and historically. The
historic occupation is famously associated with the Donner Party, but was outside the scope of the excavation and resulted primarily in surface artifacts.

The prehistoric component of the site represents 7000 years of continuous site use. It is comprised of at least four dense loci or concentrations, containing diagnostic artifacts, cooking features, and milling equipment. Within the site, two small prehistoric cooking features were excavated. They were both described as shallow and flat bottomed, constructed using slab and tabular angular boulder spalls. They appear to be constructed using local raw materials.

Feature 1 (F1) is dispersed and contains no ground stone fragments. It measures 56 x 84 cm in diameter, with no measurable depth and is essentially flat. A charcoal sample from F1 returned a conventional date of 1270 ± 60 B.P. and a calibrated date of 1060 to 1300 B.P. No faunal or botanical remains were found in this feature. F1 has the characteristics of being a rock-lined flat-oven or grill. Despite being dispersed, the cook-stones used in construction of F1 are fairly orderly; indicating that the rocks were added first then fire was constructed on top of the feature.

Feature 2 (F2) is also a rock-lined cooking feature. The feature measures 74 x 82 cm and is flat, with no measurable depth. F2 is comprised of 22 medium to large cobbles which are both described as angular and tabular. No millingstones were found in the feature. A charcoal sample from F2 returned a conventional radiocarbon date of 950 B.P. and a calibrated date of 750 to 950 B.P. No faunal or botanical remains were found in the feature. F2 also has the characteristics of being a rock-lined flat-oven or grill and appears to have the same construction methods employed as F1.
CA-PLA-5

CA-PLA-5 (Ataman et al. 1999) is located in Martis Valley, which extends north from Lake Tahoe and is in the core of the study area. Excavations at CA-PLA-5 in Martis Valley uncovered a small, dispersed, oval rock-lined cooking feature, Feature 8. The feature is oddly shaped and measures 60 by 35 cm. It is comprised of cobbles, millingstone fragments, and filled with charcoal rich midden. The bottom of the feature is rock-lined and a large piece of burned wood returned a conventional date of 1320 ± 60 B.P. The rest of the site contained fire cracked rock scatters, indicating that other ovens probably were used at the site or perhaps that stone boiling may have occurred. Artifacts associated with the feature include two ground stone fragments, four FCR, a broken hammerstone, a basalt biface, and debitage.

CA-PLA-163

CA-PLA-163 (Bloomer and Lindström 2006a) was first recorded in 1975 and then again in 1999. The site is located above Squaw Creek on a west facing terrace, within Squaw Valley, California. The artifact assemblage associated with CA-PLA-163 includes 365 flaked stone tools, over 17,000 pieces of flaked stone debitage, 32 ground and battered stone tools and six counting stones. Included in these artifacts are 31 projectile points, 195 bifaces, and six drills.

Excavations at the site uncovered one cooking feature (Feature 1) which was identified as a hearth. Based on drawings in the report the feature appears to be over 120 cm in diameter and required four 1-x-1-m excavation units to reveal the entirety of the feature. The depth of Feature 1 ranges from 5 to 32 cm below modern surface level and
has a slightly “dish shaped profile.” Some displacement of the hearth has occurred but it has seems to have retained its general profile. Two complete and one ground stone fragment are associated with the feature.

The first of two charcoal samples returned a conventional radiocarbon age of 860 ± 40 B.P. and a calibrated age of 760 B.P. The second sample returned a conventional radiocarbon age of 430 ± 40 B.P. and a calibrated age of 500 B.P. This feature is hard to categorize. Utilizing photos and drawings from Bloomer and Lindström (2006a), this feature appears to be either a flat-oven/grill or large, shallow, rock-lined oven. The method of construction for this feature is unclear.

CA-PLA-165

CA-PLA-165 (Bloomer and Lindström 2006a) is located in a sparsely wooded area on a north facing terrace overlooking Squaw Creek in Squaw Valley, California. This site contains three cooking features and three “hearth-related” features. These include what is described as a large hearth (Feature 8), two smaller cooking features (Features 9 and 10) and three hearth-rock piles (Features 11, 12, 13). The site also contains 12 bedrock milling stations (Features 1 through 7 and 14 through 17). These bedrock milling stations are spread throughout the site on low boulders and comprise both milling slicks and mortars.

The artifact assemblage from CA-PLA-165 includes 413 flaked stone tools, over 31,000 pieces of debitage, 21 battered and ground stone tools, and one modified and six unmodified bones. The flaked stone tools include 34 Martis series, nine lanceolate, three small contracting stem, one small side-notched, and six indeterminate projectile
points. Eighteen drills are also a part of the assemblage. Battered and ground stone artifacts include one abrader, three hammerstones, three handstones, 13 milling slabs, and one pestle.

Of all the cooking features, Feature 8 is the largest. It is described as slightly dish-shaped, measured 130 cm N/S x 140 cm E/W and was recorded as being 15 cm deep. Eighty-eight rocks were used in the construction of Feature 8 and two layers of rock were recorded. This may indicate the presence of a rock lid or rock layering. A charcoal sample returned a conventional date of 2770 ± 40 B.P. and a calibrated date of 2860 B.P. Flotation and macro-botanical analysis revealed “no economical plant” remains in the sediments collected from the feature. Based on the description and drawings provided, this feature appears to fall in the category of either a large, rock-lined oven with a lid or a large flat-oven/grill with a lid. It also appears possible that the method of construction could be rocks added first then fire, rocks layered with food, or a combination of both. Washoe elders indicated that this type of oven had ethnographic use for cooking things like greens and spinach.

Feature 9 is a much smaller hearth, measuring 60 cm in diameter and 16 cm deep. It lies 29 cm to 45 cm below the modern surface and is built adjacent to a larger rock-slab. It was built with cobbles and ground stone fragments and is fairly tightly constructed. A flat milling slab sits in the center of the feature’s bottom. Washoe elder, Steven James suggested this type of hearth might have been used for drying meat in the sun and could be used heated or cold. Charcoal samples acquired during flotation date Feature 9 to a conventional radiocarbon age of 2240 ± 40 B.P. and calibrated age is 2320
B.P. This cooking feature fits the parameters of a flat-oven or grill with a construction method of rocks added first, then fire.

Feature 10 is a small hearth and is very similar to Feature 9. The hearth measures 50 cm x 40 cm and contains two flat rock slabs which serve as its base. Four cobbles and one milling slab fragment line the perimeter of the feature. Flotation produced a charcoal sample that was used to date the feature and yielded a conventional radiocarbon age of 2050 ± 40 B.P. and a calibrated age of 2000 B.P. Features 11, 12, and 13 are all described as “hearth rock piles” or cook-stone concentrations. They may have been cached for use in cooking feature construction or as oven lids. Each of the features ranges from 60 to 80 cm in diameter and up to 35 cm deep. They all contain milling slabs.

**CA-PLU-44/Chilcoot Rock Shelter**

This site (CA-PLU-44/Chilcoot Rock Shelter; Payen and Boloyan 1961) is located to the northeast of the Sugar Loaf Site and was excavated in 1960. Chilcoot Rockshelter contains two features that have been described as hearths. Both features were located within the top 51 cm of fill. Feature 2 is described as being lined with “small angular stones” (1961:4). This feature appears to be a small rock-lined oven. Feature 3 is described as being a “small cup-shaped pit” which measured about 38 cm in diameter and about 31 cm deep and appears to be a rock-less earth oven. Neither feature appears to have been heavily utilized. In particular, Feature 3 contained only a “thin lens of charcoal” that defined the outline of the pit.
CA-PLU-130

CA-PLU-130 (Waechter 2001) is located in Mohawk Valley, California, just west of Sierra Valley. This site is located just outside the core use area of the Washoe, but within the periphery use zone. The site contains three rock-lined features. Feature 1 is a “compact, circular cluster of fist-sized cobbles” the majority of which are fire affected (2001:44). The feature is approximately 90 cm in diameter. No depth measurement was indicated. The feature has been affected by erosion due to grazing, which may have changed its size and shape. Artifacts found in the feature include ground stone, a battered cobbles, a chert core, four bifaces and hundreds of flakes. Radiocarbon dating returned a 2-sigma range of 1260 to 1060 cal B.P. This feature may have served as a flat-oven/grill. Impacts to the feature through erosion and trampling make distinguishing a construction method difficult.

Feature 2 is comprised of a “midden-filled pit that is lined at the bottom with small, fire-affected stones” (2001:45-47). The pit was determined to be 90 cm in diameter at the top and narrowed to 28 cm at the base. The maximum depth of the pit is 48 cm. Multiple layers of burnt soil indicate repeated use. Plant remains in the feature include acorn and two fragments of *Brodiaea* bulb. Radiocarbon dates from a charcoal sample returned a date of 790 cal B.P. and 2-sigma date range of 960 to 680 cal B.P. This feature appears to be a small but deep rock-lined oven. The FAR at the bottom of the pit does not appear to be neatly arraigned, which may indicate fire was added first to the pit, then rocks during construction of the oven. It is apparent that this is a different type of cooking feature than Feature 1.
Feature 3 is described as a stone cluster with a lens of burnt, oxidized soil that measures 70 cm by 28 cm. No dugout pit was apparent in the profile of the excavation unit containing this feature. The soil within the unit was comprised of midden. Flotation revealed a burnt *Brodiaea* bulb and two burnt acorn fragments, as well as other plant remains. Radiocarbon dating places the feature between 780 to 670 cal B.P. Plant remains would indicate that this is a small rock-lined oven, but this categorization is not definitive. The method of construction is not clear for this feature.

CA-PLU-226

CA-PLU-226 (Dreyer and Kowta 1986) is also located in Mohawk Valley, California to the west of Sierra Valley. CA-PLU-226 contains two features, one of which is a cooking feature (Feature 2). Feature 2 is described as a “fire hearth” comprised of FAR and charcoal. The feature was found beginning at 40 cm below current ground surface. Flotation revealed one unidentified seed and two pine-nuts (1 yellow pine nut and one pine nut hull) fragments in the 30 to 50 cm level of the unit containing the feature. A mano was noted above the feature. A charcoal sample retrieved from the feature dates to 900 B.P. ± 90. No other information on the feature was given. The only other feature recorded at the site, Feature 1 is a large boulder containing two small mortars and eight cupules.

CA-PLU-250

A 2011 excavation at the Beckwourth Forest Service Range District Office in Mohawk Valley, Plumas County, California revealed a surprising find. The site (CA-PLU-250; Mary Kliejunas 2013, Personal Communication), located within the
“Boneyard” or storage area at the District Office contains at least one small cooking feature. The site is located in one of the few places at the Ranger Station that does not have buried water, sewer, or electrical lines, and other subsurface modern improvements.

The feature measures approximately 80 cm in diameter, about 40 cm in depth, and contains very little charcoal; in fact only small flecks were present and were too small for radiocarbon dating. The soils around the feature did not appear to be burnt or oxidized, which may indicative of light use or the construction method where hot-rocks are heated elsewhere. No faunal or botanical remains were recovered. Though only a single feature was uncovered, it is possible that there are more intact features remaining. Based on the measurements and images of the feature, this feature should be categorized as a small rock-lined oven. Exact construction method could not be determined at this time.

CA-SIE-47

CA-SIE-47 (Payen and Olsen 1969), formerly known as CA-SIE-S44 was excavated in 1967 and is located on top of a knoll at the north end of Stampede Valley, CA. The site contains no less than four potential cooking features, three of which are described as rock concentrations and one as an ash lens. It was reported that not all rock concentrations were recorded during the excavation, so it is possible that more cooking features exist at the site. There was an abundance of ground stone throughout the site including pestles, slab mortars, manos, and metates. The site also contains a bedrock milling slick, Feature 11. No data is available on botanical remains at the site and only four calcined bones were recovered.
Feature 1/3 is described as a rock concentration measuring 100 cm in diameter and is 15 to 30 cm deep. Feature 4 is a small ash lens measuring 20 cm in diameter. Feature 9 is a large, shallow rock concentration measuring 200 x 100 cm and 25 cm deep. Feature 10 is a small, shallow rock concentration measuring 100 cm in diameter and 30 cm deep. Features 1/3, 9, and 10 are all possible flat-ovens or grills. The construction method of these features is unclear. Feature 4 does not incorporate cook-stones but may have served as a fire used to heat rocks for cooking, used for direct cooking, or fire for warmth.

26D037/Daphne Creek Site

The Daphne Creek Site (Elston 1971) is located east of Lake Tahoe in the Carson River drainage in Nevada. The site was excavated in three test areas, which were named Areas A, B, and C. Area A had the first 20 cm of soil removed by a bulldozer previous to excavation. Within this disturbed area appeared to be the partial remains of a “fire hearth”. The soil around the potential hearth was dark brown, loose, and sandy. No number was assigned to this feature and it has not been included in the analysis of this thesis. Apparently, there was little else of cultural relevance excavated in Area A. Area B contained two potential hearths, but according to Elston (1971:109) there is little to prove that they were man made. Little other relevant information was available on Area B. Area C is where the majority of the cultural deposit at the site was located. Unfortunately, much of the subsurface deposit in Area C was destroyed by a contractor (Elston 1971:110). Regardless, the surface of Area C is comparable to other areas of the site but excavations revealed five rock-lined cooking features (Features 2, 5, 8, 9, and
16), two grinding stone caches, and nine other assorted rock features. Some of the associated rock features are constructed like rock-lined ovens but do not have associated charcoal or ash linings.

Feature 2 is described as being representative of the rest of the cooking features at the site. It is 69 cm in diameter and 5 cm deep and dates to 460 B.P. Elston (1971) describes the feature as containing two layers of rocks. The first layer lines the earthen pit and is made up of “angular, fist-sized stones” (110). A fire would have been built on top of this layer and more rocks would have been added on top as a lid. This fits the description of a small, flat-oven with the construction method where hot-rocks are layered with foodstuffs.

26Wa99 Thomas Creek

At 26Wa99 (Hutchins 1997), located at Thomas Creek on the Mt. Rose Fan in Nevada, 25 rock-lined and unlined pits were excavated by Hutchins (1997). These pits are described as being about one meter in diameter and constructed of rocks that are semi-flat to sub-round in shape. The pits contained multiple artifacts including ground stone fragments, but debitage was most prevalent. No charred plants were reported. Four of the features contained burnt bone, so it seems possible these features may have had multiple uses.

Some of the pits are built directly adjacent to and between large boulders. Hutchins postulated that the pits were not used for cooking but instead for heat treating or altering toolstone and early stage bifaces before completing tool manufacturing. He does
acknowledge a possibly for use as a cooking ovens, and therefore these features are included in this study.

26Wa1676/Bordertown

The Bordertown site or 26Wa1676 (Elston 1979) is a large winter habitation site which lies on what is now the border of Nevada and California. The site contains no less than 16 cooking features as well as associated house pits, storage pits, rock piles, and a single burial. Cooking features types present at the site appear to be flat-ovens/grills, small rock-lined ovens, and cook-stones for boiling. The site has been broken up into three areas called the Flat, the Ridge, and the Swale (Elston 1979:207). Within the Flat, only one of the three features located, Feature 45, is a cooking feature. This feature is described as a flat hearth with a rock ring containing only two large cobbles, which surround an area of midden soil.

The majority of the features at the site were located during excavations on the Ridge. Here, Features 48, 57, 58, 67, and 94 which are described as “rock-lined hearths in pits” were excavated. Feature 10 is described as a “flat hearth” (Elston 1979:224). This feature appears to be a flat-oven/grill. Feature 34 is described as a “pile of rounded stones” which was likely used for boiling and may have been associated with Feature 58. These features are part of Complex Feature G (218, 225). Artifacts including tools and ground stone are reported to be associated with most of these features. Feature 53 is described as a “hearth in a pit with a rock ring” (224). Features 53 and 10 are part of Complex Feature A, which is a house.
The third part of the site, called the Swale, contained the remaining features. One burial, Feature 69, was located on the last day of excavation. Several “rock-lined hearths in pits” are located on the Swale and include Features 13, 14, 15, 16, 39, 49, and 62 (Elston 1979:227). Based on their descriptions, these all appear to be either flat-ovens/grills or rock-lined earth ovens. There is a close association between the cooking features and nearby features classified as rock piles. Elston (1979) suggests that the reason for the close association between the rock piles and the cooking features indicates that the rock piles may have served as lids for the ovens. They would have been removed to retrieve food from the ovens when cooking was complete.

26Wa1696

26Wa1696 (Turner 1993) is located in Truckee Meadows, northeast of central Reno, Nevada. This site, along with 26Wa1697 sits above the base of Peavine Mountain. This site was excavated to mitigate damage from the expansion of McCarran Boulevard, a major thoroughfare. Excavations at this site located one tightly constructed, small rock-lined cooking feature. Feature 1 measured 65 cm by 45 cm in diameter and about 12 cm from the highest cobble to the bottom of the feature. Feature 1 contained no faunal remains, charcoal, or artifacts. Turner noted the similarity of this feature to others located at nearby 26Wa1697 (1993:119). This feature meets the description of a flat-oven/grill which has been constructed by first adding rocks, then fire.

26Wa1697

26Wa1697 (Turner 1993) is also located near the base of Peavine Mountain in Truckee Meadows, Nevada. Excavation revealed substantial results like those at CA-
PLU-1485. Twenty-two rock-lined cooking features were recorded. Turner (1993) categorized these features into two types; block-lined and slab-lined hearths. He categorized the majority of the features as block-lined hearths and thought these features were for multipurpose, everyday cooking. The slab-lined hearths were found to be for more specific use, most likely for roasting. In this case, features he categorized as block-lined hearths have been categorized as flat-ovens/grills. Those Turner categorized as slab-lined hearths have been categorized here as rock-lined ovens. Some of these features do not meet the criteria laid out in Chapter II for depth of rock-lined ovens. This may be due to differences in measurement techniques and therefore, photographic and descriptive evidence takes priority in categorization of these features over depth measurements.

Fourteen of the twenty-two features returned conventional radiocarbon dates ranging from the most recent at 260 ± 120 B.P. to 1565 ± 130 B.P. Feature 13, which returned the most recent cooking feature related radiocarbon date, not only at this site, but in the entire study area, is considered historic. This feature contained decaying mammal remains and is categorized as a flat-oven/grill. Some of the ovens contain plant remains, including *Brodiaea*, and charred small mammal bones. Seven of the features were reported to contain ground or battered stones. Turner postulates that many of the features were not reused or scavenged by later site inhabitants, but the construction of new ovens nearby occurred instead. However, Features 2 and 19 both appear to have had two samples radiocarbon dated and both returned two separate dates, showing that features were used repeatedly.
26Wa2065 Glendale Site

26Wa2065 (Miller and Elston 1979), also known as the Glendale site is located on Glendale Avenue in Reno Nevada. The site lies in close proximity to the Truckee River and has been heavily disturbed by repeated modern development. However, two pits with rock rings, two rock-lined pits, and three miscellaneous pits containing rocks were reported. In addition to these distinct features, un-patterned and unstacked rock concentrations were located in the site, possibly indicative of stone boiling or use as lids and construction materials for ovens. The pits range in size from 30 cm to 100 cm in diameter. Possible functions of these features are listed as storage pits and hearths. Ground stone, whole and fragmented, as well as other artifacts were found in association with the features. The site has been interpreted by Miller and Elston (1979) as a winter habitation site with house pits and a distinctive midden area away from the habitation area.

26Wa3017 Vista

26Wa3017 or the Vista Site (James et al.1982; Zeier and Elston 1986) is located in Truckee Meadows along the Truckee River. A total of 15 rock features were excavated over the course of a test excavation (James et al. 1982) and a subsequent data recovery (Zeier and Elston 1986). The 15 features varied in size, structure, and apparent function. They have been divided into rock piles, rock scatters, and circular arraignments. Pit features were also uncovered which may have been used for storage, refuse disposal, or as earth ovens. They range in size from small to large. The small pit features measure up to 50 cm in diameter and contain faunal remains and artifacts. The larger features
contain charcoal, ground stone and other artifacts as well as faunal remains and are
described as being steep-sided. Some of the larger features are rock-rimmed. They vary
in size from 100 cm to 130 cm in diameter.

Four of the features have been determined to be probable cooking features.
These include Features 4, 14, 37/66, and 38. Feature 4 is a small collection of flat rocks,
including several ground stone fragments. Charcoal is located around the feature and a
sample returned a conventional radiocarbon date of 830 ± 60 B.P. This feature may have
been a small flat-oven/grill. Features 14, 37/66, and 38 are described as having oval-
shaped depressions, all three with ground stone, and two with a few seeds. Feature 14
contained ochre. These three features are all likely rock-lined ovens or flat-oven/grills.

26Wa6872 Hungry Valley Site

Hungry Valley (Young 2002) is located north of Reno, Nevada. Here, an
excavation at 26Wa6872 revealed a village site and one rock-lined cooking feature
(Feature 1). The feature was built from sub-angular volcanic rocks and granitic cobbles.
These rocks were about fist size and Feature 1 appears to be well formed, with a
significant basin shape. A cluster of rocks nearby has been interpreted by Young (2002)
as a potential oven lid. The feature measures about 60 cm in diameter and 18 cm deep.
The calibrated radiocarbon date places the feature between 680 and 520 B.P. No
associated ground stone or food remains were reported. Although Feature 1 measures 18
cm in depth, which is less than the 30 cm depth threshold utilized by this thesis, the
feature fits the description of small rock-lined oven more so than a flat-oven/grill. Based
on the well-formed nature of Feature 1, it appears that it was constructed by first adding rocks to a basin pit, then adding fire on top of the rocks.

Results

The results of the excavation at Sierra Valley and research into cooking within the study area, shows a nearly 5000 year history of use of rock-lined cooking features. The oldest rock-lined cooking feature is Feature 1 at CA-PLU-1487/H, which dates between 5455-5060 cal B.P. This large feature has been categorized as an indeterminate type, possibly a single large cooking feature or multiple collapsed features. The most recent cooking feature dates to just before the contact or to the historic period. Feature 13 at 26WA1697 dates to 260 ± 120 cal B.P. This feature measures only 60 cm in diameter, was found to have charred bone, decaying mammal, and fish remains inside. It has been categorized as a flat-oven/grill.

These 5000 years of cooking history is quite telling. Of all the 142 features, 57 of them were categorized as flat-oven/grills, 20 were categorized as rock-lined ovens, two as earth ovens, one as cook-stones for boiling, and 13 ash lenses of unknown purpose. The remaining 49 are categorized as indeterminate type. These types are listed by size in Table 4.

Far less could be told about the cooking feature construction method, though the results are listed in Table 5. One hundred one of the features are of indeterminate construction method. Twenty-one features are considered rocks added first, then fire. Eleven features are considered to be constructed by first adding fire to the pit, then rocks.
Nine features appear to be hot rocks layered with foodstuffs. However, none were determined to be of the final construction method of hot rocks heated elsewhere. These results are discussed in the final chapter.

Table 4. Frequency of Cooking Feature by Type

<table>
<thead>
<tr>
<th>Cooking Feature Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Cooking/Ash Lens</td>
<td>13</td>
</tr>
<tr>
<td>Earth Oven (Rock-less)</td>
<td>2</td>
</tr>
<tr>
<td>Small Flat-Oven/Grill (Rock-Lined)</td>
<td>51</td>
</tr>
<tr>
<td>Large Flat-Oven/Grill (Rock-Lined)</td>
<td>6</td>
</tr>
<tr>
<td>Small Rock-Lined Oven (Over 30 cm deep, less than 100 cm diameter)</td>
<td>17</td>
</tr>
<tr>
<td>Large Rock-Lined Oven (Over 30 cm deep, over 100 cm in diameter)</td>
<td>3</td>
</tr>
<tr>
<td>Cook-Stones for Boiling or Oven Construction</td>
<td>1</td>
</tr>
<tr>
<td>Indeterminate:</td>
<td></td>
</tr>
<tr>
<td>Flat-Oven/Grill or Rock-lined Oven</td>
<td>35</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>142</td>
</tr>
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</table>

Table 5. Frequency of Cooking Feature Construction Method

<table>
<thead>
<tr>
<th>Construction Method</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock Added First, Then Fire</td>
<td>21</td>
</tr>
<tr>
<td>Fire Added First, Then Rocks</td>
<td>11</td>
</tr>
<tr>
<td>Hot Rocks Layered With Foodstuffs</td>
<td>9</td>
</tr>
<tr>
<td>Rocks Heated Elsewhere, Then Added</td>
<td>0</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>101</td>
</tr>
</tbody>
</table>
In terms of distribution of age of the features, 97 of the 142 features have not been dated. This leaves 45 features that have radiocarbon dates. Of these, 31 features date from 1000 B.P. to 260 ± 120 B.P. Some of these features have multiple radiocarbon samples dates but at least one date places them in this time range. This means that nearly seventy percent of all dated features were used in the last 1000 years. Of these 31 dated features, 11 were determined to be rock-lined ovens, 12 were determined to flat-ovens/grills, and nine were indeterminate.

Of the 14 features dated to before 1000 B.P., eight were defined as flat-oven/grills, one was defined as a rock-lined oven (which also has a second radiocarbon date that is post-1000 B.P.), and the remaining five are indeterminate. As this small dated sample shows, the majority of these rock-lined ovens date to after 1000 B.P., while the flat-oven grills are more equally distributed over time.

Six of the cooking features had two samples submitted for radiocarbon dating. For all six of these features, the two separate radiocarbon samples showed that the features had been used on multiple occasions. These ranged between 200 and 600 years apart. It is not clear if this is continuous use over this time or re-use in later periods. Several reports indicated that some features showed signs of re-use, including excessive FAR and FRC buildup in the site and large amounts of charcoal in the feature. However, without radiocarbon dates to show definitive re-use, it is difficult to know with any certainty.

While all sites reported the presence of ground stone, some in quite abundance, only four sites contained bedrock milling features. They are the Sugar Loaf
Site, CA-PLA-165, CA-PLU-226, and CA-SIE-47. The Sugar Loaf Site contains nine bedrock milling features, each with multiple individual milling stations. Most of these features are milling slicks, though there are several shallow mortars and one deep mortar. One feature contains eight cupules. These milling stations are located throughout the center of the site. CA-PLA-165 contains 12 bedrock milling stations, most of which are milling slicks and some mortars. These are scattered across a terrace at the edge of a moraine along the edge of the site. CA-PLU-226 contains two small mortars and eight cupules. CA-SIE-47 contains a single milling slick. At least eight of the sites report or appear to be habitation sites with house pits or other clear evidence of occupation. These include the Bordertown, Glendale, Vista, Hungry Valley Sites, as well as 26WA1676, 26DO37, CA-PLU-1485, and CA-PLU-1487/H. These sites are also among those with the highest numbers of cooking features in the study.

Summary

This chapter presented what is currently known about the 5000 year history of hot-rock cooking within the study area. First, each of the 17 sites with cooking features located outside of Sierra Valley was discussed. Next, this information including feature types and construction methods, botanical and faunal remains, and associated features was quantified and discussed in the Results section. The age of the features, as it is relevant to feature type was also examined. Finally, associated features such as bedrock mortars and house pits are considered. The final chapter of this thesis discusses these results in relationship to the expectations outlined in Chapter II.
CHAPTER VI

INTERPRETATION, DISCUSSION,

AND RESULTS

The primary goal of this thesis was to explore the development of cooking technology through time within what is considered the traditional Washoe territory. This thesis revealed a 5000 year history of hot-rock cooking in the study area. Research through the NEIC, NSM, and UNR Special Collections found information about no less than 142 cooking features within 22 sites. These features range in nature from small, shallow flat-ovens or grills to large, deep rock-lined ovens. Though the quality of data available on each of these features varies widely, what quickly became clear was that these cooking features were not uncommon. On the contrary, evidence of cooking seems to be quite ubiquitous across the landscape. This chapter interprets the overall results of the study. In order to do this, the original expectations which were outlined previously in Chapter II, are examined in light of all the data collected. Limitations of the study are discussed as well as areas for future research.

Interpretation and Discussion

This thesis utilized the task-differentiation framework to create a set of expectations to study women and cooking in the archaeological record. Five major expectations were outlined and are discussed below. The first expectation is under the
social dimension of the framework. The social dimension can be used to investigate not only who is completing the task, but also who the task is being completed for, or the consumer. The first expectation under this dimension is that: if cooking and other women’s activities are present at a site, this should be well represented within the site’s design. I expect to see milling, storage, and cooking features located prominently within a site.

This expectation had interesting results. It appears that the design of each site varies widely based on numerous factors. At least four sites report the presence of bedrock milling features with mortars, milling slicks, and/or cupules. At CA-PLA-165 and the Sugar Loaf Site these milling features are situated in such a way that would allow women to sit in close proximity to one another and process food, giving them an opportunity to socialize. At CA-PLA-165, a total of six cooking related features are present and twelve bedrock milling features. Here the milling features are described as being low to the ground and located on a terrace. The cooking features are located in close proximity to the bedrock milling features and the general focus of the site seems to be on cooking and grinding food.

In the case of the Sugar Loaf Site, food processing and cooking activities make up the heart of the site. Here the bedrock milling features surround a single cooking feature to the north and south to form a kitchen area. In this case, the site appears to be task-based, focused on milling and cooking because no house-pit features, evidence of intensive hunting, or lithic reduction areas appear to be present within the site. There are also at least 14 sites within close proximity of the Sugar Loaf Site, some that have good
potential for subsurface components, but have not been excavated. In this case, were subsurface components such as house pits present at these nearby sites, this might represent an interesting land-use pattern where cooking and food processing are segregated. In this scenario, women would have their own areas, separate from the general group to process and cook food.

At CA-PLU-226 and CA-SIE-47, only a single milling feature is present at each site. CA-PLU-226 has one cooking feature and one boulder with two small mortars. The kitchen area of this site appears to be smaller, perhaps more for individual or family use. CA-SIE-47 has four cooking features and a single bedrock milling slick. The report for this site indicates that more cooking features may be present but unrecorded. In this case, cooking more so than milling might be the focus of activities.

Multiple sites contained storage pits and several others: CA-PLU-1485/Buttes, CA-PLU-1487/H, 26WA1676/Bordertown, 26Wa2065/Glendale, 26Wa3017/Vista, 26Wa6872/Hungry Valley, and 26DO37 are described as being habitations sites and/or containing house pits. At the Bordertown site, which was one of the more extensive excavations, at least one cooking feature was located within a house pit, while another house pit appears to have cooking features immediately nearby. The report on this excavation indicates the site might have been a winter habitation site. This may suggest that seasonality had an important impact on cooking methods and cooking facilities used.

However, the conclusions that may be drawn about the prevalence of cooking and women’s activities at the site can be limited due to the nature of the excavation completed. All of the sites in this study containing a large number of cooking features are
considered to have had data recovery excavations, while only a few of the sites with limited cooking features had a data recovery style excavation. Naturally data recovery, a method where a site is extensively excavated when it is likely to be destroyed or otherwise harmed, is more likely to reveal multiple subsurface features. Limited testing, which usually involves just a few excavation units or test pits, is far less likely to reveal multiple features. Therefore, it is unclear what percentage of activities cooking and food processing represent at many of the sites with smaller excavations.

It seems that these sites varied widely in site design due to seasonality of use and functional type, such as task-based sites versus habitation sites. This variability may be due to what resources were being gathered from the area during that season of use. Furthermore, site design might be more affected by milling than cooking since bedrock boulders cannot be moved. This indicates there is some environmental determinism at hand in the design of these sites, and it is possible site location is first chosen by suitable bedrock boulders and cooking features can then be more flexibly placed in the creation of kitchen areas.

Beyond prevalent placement of cooking features and bedrock milling stations, I also expected to see widespread use of ground stone, cooking utensils such as tongs, and other cooking related tools such as fire drills. At least 40 of the cooking features themselves contained ground stone, while almost all the sites reported portable ground stone implements being present in various levels of abundance. The “donut-stone” at the Sugar Loaf site may be a part of a fire pump drill or other fire starting mechanism and a somewhat different stone disk at 26Wa1697 is also a probable part of a fire starting kit
Other cooking utensils, often made of organic materials, are far more difficult to see in the archaeological record and often do not stand the test of time. Unsurprisingly, these organic artifacts like tongs and baskets for boiling have not been reported at any site.

An important note on surface abundance of portable ground stone implements; these artifacts are very enticing to “collectors.” Well-formed ground stone artifacts are often absconded with quickly at archaeological sites with easy public access. The majority of these sites have such access, so it seems safe to assume that ground stone artifacts on the surface of these sites are likely not representative of what previously existed. Regardless, between the nearly ubiquitous use of ground stone at these sites and the large number of features containing ground stone and fragments, it appears this expectation is met and that women and cooks are clearly represented in the archaeological record at each of the sites.

I also expected to see ovens located relatively near the resource being processed in them. This would indicate that the processing of collected food was heavily influential in site location. Unfortunately this data is hard to acquire and evaluate. In order to analyze this expectation it was first necessary to understand what was being processed in the cooking features. Nearly half of the features studied had no reported data for either faunal or botanical remains. Of the remaining half that did have data, around 60 percent reported recovering no faunal remains and about 50 percent recovered no botanical remains. Botanical remains were only recovered from 37 features and two of those contained juniper, probably from an old growth tree growing nearby.
Of those 37 features, 16 are reported to have contained Poacea, which is a family of over 10,000 grasses. Edible varieties which exist in the study area include Basin wildrye (Leymus cinereus) and Indian ricegrass (Achnatherum hymenoides) (United States Department of Agriculture [USDA], Natural Resource Conservation Service [NRCS] 2014a, 2014e). However, included in this grass family are also non-native grasses such as cheatgrass (Bromus tectorum L.). Brought over by ranchers and farmers, cheatgrass was first noted in what is now Colorado in the late 1800s. By the 1930s it became a ubiquitous problem across the western United States (United States Department of Agriculture [USDA], Natural Resource Conservation Service [NRCS] 2014c). Therefore, while Poacea is the most commonly found plant in these cooking features; it is of little help to the understanding of what was being processed in them. However four of the features report Elymus, a genus within the Poacea family. This genus includes 150 species of grass, including Basin wildrye and squirreltail. Blazing star (Mentzelia) was found in two of the cooking features. Blazing star is a plant identified by Tilley and Rucks (2011) to be an ethnographically important year round food source. It was commonly ground into a paste and added to soups.

Five features contained a total of 222 bitterbrush (Purshia tridentate) seeds. Bitterbrush is a common shrub within the study area and is a favorite food of mule deer, but has not been used for human consumption (United States Department of Agriculture [USDA], Natural Resource Conservation Service [NRCS] 2014a). The presence of these seeds may reflect the use of bitterbrush as a fuel, though it was likely fast burning.

Camas, Brodiaea, pine nuts, acorns, and sunflower were all found in some of the
features, and are all known food resources. However, they have not been found consistently throughout the features.

Far less information is available in terms of faunal remains. Fifty percent of the features reported no data on whether any faunal remains were recovered. Of the remaining features, around 60 percent found no faunal remains present. Of those features reporting faunal remains, very few species level identifications were made. These identifications included mule deer, black tailed jackrabbit, coyote/dog, and some species of fish. Nine features reported small/medium mammal, nine features reported medium/large mammal, and ten features reported vertebrate bones.

Faunal and botanical information on what resources were being processed in these ovens is inconclusive. Even where botanical or faunal remains were found, they were almost always found in small amounts. It is clear that some animals were being processed and a variety of small seeds and some bulbs were also being cooked. However, not enough data exits to be able to definitively state that where sites are located is heavily influenced by the resources being cooked in the ovens present at each site.

The last set of expectations under the social dimension had to do with the consumer, or who was receiving the food. If the needs of the consumer are such that bulk processing is necessary, I expected to see larger rock-lined ovens (over 1 meter in diameter) present in sites. If cooks were processing food for smaller groups or individual families, I expected to see smaller rock-lined ovens (1 meter or less in diameter) present in sites. This study found that large rock-lined ovens are far less common than their smaller counterparts. The vast majority of the identifiable cooking features were small
rock-lined flat-oven/grills. These features are defined as being less than one meter in diameter and less than 30 cm in depth. They can be used to cook multiple food types and could possibly be converted to small roasting pits. They can be used with or without lids, and were found in both ways in the study area. Ethnographically, they were used for cooking greens, drying meat and berries, frying like a modern day frying pan, and other purposes. These multi-use features make up nearly 36 percent of the total features discussed in this study.

The next most common features are small rock-lined ovens. These features are under one meter wide and over 30 cm in depth. A total of 17 small rock-lined ovens were identified and they make up almost 12 percent of all the cooking features. Some of these features appear to have been used as roasting pits for foods like bulbs, which need considerable cook times. Small rock-lined ovens might be used for bulk processing when pits are dug deep enough to allow for a larger capacity of food. Some of the cooking features at the Webber Gravel Pit are deep enough to have allowed for large batches of a foodstuff to be cooked. These smaller features seem to point to the vast majority of cooking occurring for smaller groups or individual family units, though some bulk processing, possibly for storage, in preparation for winter, or after a good harvest or game drive might have occurred.

Only three large rock-lined ovens were identified. These features are all from CA-PLU-1485 or the Buttes Site in Sierra Valley. These large ovens remain truly unique within the study area. One reason for this could include that the site was a special, camas and bulb bulk processing station, though the ovens were clearly used to cook other food
items based on the faunal and botanical remains recovered. Another option is the site may have been used by another group who are not the ancestors of the Washoe and were more focused on bulb processing. Sierra Valley has always been considered a difficult place to define ethnographic boundaries, so it is feasible that the site could be attributed to other groups. Regardless, these three features remain exceptional and only time and further investigation will reveal whether others exist in the region.

Based on cooking feature size and type, it does not appear that large amounts of bulk processing were occurring in the study area. Although the small deeper rock-lined ovens likely were used for bulk processing, they could also be used for routine cooking for individuals, families, and small groups. It is possible that in sites where large numbers of small rock-lined ovens and flat-oven/grills exist, that bulk processing could occur through the use of multiple small features, though these features would have to have been contemporaneous for this to be possible, a topic discussed below.

The next set of expectations falls under the temporal dimension of the task-differentiation framework. This factor considers aspects involving time, such as the duration of a task or seasonality. Changes in the temporal dimension can be indicative of major environmental, social, and cultural fluctuations. The first expectation under this dimension is that if resource intensification is occurring in the study area, I expected to see multiple indicators including an increase in the number of rock-lined ovens around 1000 B.P. throughout the study area.

In order to analyze this expectation, data about the age of each feature was collected. Forty-five of the 142 total cooking features have radiocarbon dates. Of these,
31 are dated between 1000 B.P. and 260 ± 120 B.P. The other 14 features date from pre-
1000 B.P. to 5455-5060 cal B.P. This means that nearly seventy percent of the dated
features (both flat-oven/grills and rock-lined ovens) were used in the last 1000 years.
While this is a small percentage of dated features in total, it is rather convincing evidence
that an increase in use of rock-lined cooking features is occurring at this time. This
expectation appears to be met but standing alone does not appear to be strong enough
evidence that resource intensification is occurring and so other expectations were also
developed.

I also expected to see another indicator of resource intensification through the
use of previously underutilized resources such as camas, entering the diet around 1000
B.P. This expectation is hard to examine due to the nature of the botanical and faunal
remains reported in these features, as previously discussed. Twelve of the features which
reported botanical remains contained bulbs including camas, *Brodiaea*, and some
unidentified bulbs. These features are located at CA-PLU-1485, 26Wa1696, and CA-
PLU-130. Five of these features have radiocarbon dates and all date to post-1000 B.P.
Five features report pine nuts, with two of these features dating to after 1000 B.P. Four
features report acorns, two date to post-1000 B.P. and one dates to 3610 ± 50 cal B.P.
Though this is a very limited sample size, this shows the possibility of the use of acorns
in the area for extended periods of time, while camas and other bulbs might be of more
recent use. However, this sample size is too small for any definitive statement that any
previously used resources are now prevalent in the diet and this expectation has not been
met.
Regardless, there may be ways to better understand what ovens were being used for. When considering the general lack of botanical remains, preservation issues are often considered. However, it is important to contemplate the notion that a good cook would not frequently burn or discard food items in their oven. Part of the oven firing process generally includes removing excess ash and cleaning the oven surface in preparation for food. It is logical to assume then, that old food items would be removed before an oven was fired again. Moreover, midden deposits adjacent to cooking features might be a more promising way to test what was cooked in these ovens. Here, archaeologists are likely to find the remains of burnt items that have been thrown out as well as any other content swept up in the cleaning process.

Another consideration is that bulb and corm resources involved the time consuming process of individually digging and removing them from the earth with an implement such as a digging stick. It seems likely that individual cooks would attempt to utilize as many of these bulbs as possible without waste. Additionally, it would also be easier to remove bulbs, which are larger food items from the ovens as opposed to seeds, being much smaller and easier to lose. This is likely to bias the archaeological record in favor of small seeds.

A switch to a more labor intensive form of cooking, with requirements including: digging pits, acquiring appropriate rocks, gathering fuel, and collecting and processing the plants, would indicate that a larger percent of daily life was devoted to cooking and spending time in the kitchen. With a higher level of investment in building
and maintaining cooking features, there may be higher investment in a site. If this is occurring, I expect to see re-use of cooking facilities and cook-stones.

Where there is a buildup of ash and charcoal staining, it is a likely indication of repeat firings of an oven and many of the features were reported to have this buildup. Ethnographically, ovens were cleaned out between firings and large buildups of ash and charcoal near an oven is likely a sign of repeat cleanings and therefore, repeated use. However, the most objective test of repeat use of ovens is through absolute dating techniques, like radiocarbon dating through multiple samples. Six of the cooking features had two samples submitted for radiocarbon dating and all six of these features showed they had been used on multiple occasions. The samples from these features showed that they could have been used for 200 to 600 years, though it is not clear if this is continuous use over this time period or re-use in later periods. Six features show definitive re-use. In addition to the fact that the majority of the rock-lined features are flat-oven/grills, which require the least amount of time and labor investment to create, it seems likely that these cooking features do not reflect an increase in sedentism. However, re-use is apparent and this expectation highlights the need for good radiocarbon dating of features and the usefulness of multiple samples.

The last expectation under the temporal dimension is that: if Thoms’ (2009) Working Model for Land-Use Intensification: Expected Temporal Patterns for the Use of Cook-Stone and Other Heating Elements for Cooking is appropriate for the study area, I expect that the development of cooking features follows a clear pattern of development. According to the model, direct cooking should be the oldest method of cooking, followed
by unlined earth ovens. These features should be followed by flat-oven/grills and dispersed rock-lined ovens. These features should become more tightly and carefully constructed through time. Use of rock-lined ovens and stone boiling should be widespread in the later periods.

As previously stated, the vast majority of the features in this study have not been subjected to radiocarbon dating and none of the rock-less earth ovens have been dated. While relative dating methods, including projectile point chronologies have been used to categorize multiple sites and features in this study, only absolute dating techniques were considered here. The first dated cooking feature in this study is over 5000 years old, while humans began occupying the area somewhere around 5000 years before that time. This means thousands of years of cooking history are not being reported by this thesis. This may be due to the general paucity of sites dating to pre-5000 B.P. in the study area or the difficulty archaeologists may have recognizing rockless earth ovens and ash lenses.

However, of the dated features, there is a clear increase in use of small rock-lined cooking features, including ovens after 1000 B.P. and the only large rock-lined ovens appear at this time as well. Some of the older features tend to be more dispersed, indicating potentially less time and energy investment in construction, different construction methods, and/or different resources being cooked. So far, the data appears to support part of the model, where rock-lined features are introduced. Little information is yet available on earth ovens and stone boiling in the study area. These features are
difficult to study and cleaned out earth ovens might resemble or be confused for storage pits, while stone boiling might only be reported as a collection of FAR/FCR and charcoal.

It is also possible that some of these older rockless and rock-lined features are not preserving well. Impacts such as grazing and erosion may cause rock-lined features which were once more compact and systematically constructed to become more dispersed. As studies of cooking become more widely undertaken and more absolute dating of cooking features is completed, Thoms’ model should prove to be very applicable to the study area. Once a full range of sites with cooking features has been dated, the model can truly be tested and adapted to the study area. It is possible by the time the first inhabitants entered the Lake Tahoe region that they already possessed the knowledge of hot-rock cooking and so the model should be adapted to reflect this.

The last expectations of this thesis fall under the spatial dimension of the task-differentiation framework. The spatial dimension considers the context in which a task was completed. Under this dimension, I expected that sites should be distinguishable as to whether they contain public/communal spaces from those with private/domestic spaces based on kitchen features present at a site. If sites with communal spaces are present, I expected to see multiple contemporaneously utilized cooking features and if present, multiple bedrock milling stations. If sites contain domestic and private spaces, I expected to see only a single or few cooking features and bedrock milling stations.

Of the twenty-two sites, seven have a single cooking feature and 15 have more than one cooking feature. However, the Sugar Loaf Site contained only one excavated oven but also contained a cluster of unburnt stoned and nine bedrock mortar and milling
slick features, with a total of 36 milling stations. This, in combination with the abundance of FCR at the site, indicates that more subsurface features and ovens are likely. This is not an uncommon description of these single feature sites. The Sugar Loaf Site was likely a place where small groups gathered to use the various bedrock milling features and to cook the processed foods. It does not appear to be a habitation site.

Four notable sites (CA-PLU-1485, 26Wa99, 26Wa1697, and 26Wa1676) have sixteen or more cooking features and likely represent important habitations sites. At CA-PLU-1485, several of the rock-lined cooking features were used contemporaneously based on the radiocarbon dates provided. This site certainly could have been a communal use site. At 26Wa99, only one feature has been dated so it is unclear if these features were used at the same time. At 26Wa1676, twenty features were located. Of these features, 14 were dated and seven of the features appear to have had at least one other feature used at the same time. This may be indicative of group use at the site. At Bordertown/26Wa1676, two of the features have been dated. They are approximately two hundred years apart in age, though this does not rule out concurrent use with other features.

Nevertheless, other considerations must be made when analyzing whether a site contains communal cooking areas versus private or domestic areas. The whole site design must be considered. Questions should be raised such as: Is there a distinctive cooking and food processing area within the habitation site or are there more domestic and private areas reserved for this purpose? Just because a site has a high number of cooking features does not mean these private areas do not exist. One example of cooking
in the domestic realm is clearly seen at the Bordertown Site/26WA1676. Here a cooking feature is located within a house pit, but excavation revealed at least sixteen total cooking features. If only the number of cooking features were considered at this site, it might be easy to say that this is a communal cooking area, when in reality it seems more likely to be a series of domestic spaces.

Another compounding factor is when radiocarbon dating is not or cannot be extensively used. In this case it is difficult to tell whether these features are being used contemporaneously or represent separate repeated occupations of the site over time. In this case, where features are not used contemporaneously it might show a history of long repeated use of a site by a small group and indicate that the domestic realm is well represented in the archaeological record. An important factor when considering this expectation lies in how extensive the excavation of each site was which can easily bias the outcome. It was a common theme throughout the archaeological reports examined for authors to note other concentrations of FAR/FCR and cooking features that were located but not recorded or excavated: so truly many more cooking features are likely present at the sites examined here.

Ultimately, it is possible to see domestic kitchen spaces versus communal kitchen spaces in the archaeological record based on the cooking and milling features present. Though, these must be considered within the temporal and spatial contexts of the features. It is first important to clarify if the features were used at the same time or if they represented repeated re-use of the site. It is also important to understand where in the site the features are located. Are they near the habitation areas and segregated from each
other as part of the domestic realm, or are they located together as part of a communal space.

Limitations of Study

Testing some of the expectations put forth in Chapter II of this thesis was challenging. First, before the expectations could be tested, the features had to be categorized by type and construction method. Categorizing and identifying cooking feature types and methods of construction was more difficult than previously anticipated. This is due to a number of factors. Often dimensions were simply not provided or descriptions of the feature were not sufficient in order to make a determination. Both rock-lined and rock-less features can be equally difficult to interpret. Ash lenses may be the result of fire for warmth, direct cooking, or poorly described earth ovens. They are particularly hard to distinguish without depth and faunal/botanical data. The method of construction for rock-lined features was by far the most difficult factor to determine. This was often complicated when no photos or drawings were available to evaluate. Even when photos were available, re-copying of the original document often obscures the quality of the image, even when they are from an archaeological information repository. This is further compounded when the features are limited in description and when depth or other measurements are not indicated. Not having data on radiocarbon dating available was probably the most detrimental factor to the outcome this study. It is almost impossible to understand how these features changed through time when their age is unknown.
The most complicated part of studying these cooking features lies in the very nature of their use. When features are used in multiple ways, such as a small flat-oven for cooking spinach-like greens one day and as an oven with a lid or cap the next day, this can be very confusing in the archaeological record. If ovens were cleaned often, and charcoal and ash was removed from the oven, this also complicates interpretation. Perhaps a feature which lacks charcoal, botanical, or faunal remains is indeed a cooking feature of some kind, but it has been well maintained and cleaned by its user. Of course some type of FAR/FCR or oxidized earth should be present. Additionally, ovens may appear “tightly constructed” because cooks neatly returned rocks to the oven after use and intended to use them again; this in and of itself may be a sign of re-use.

Another limitation this study faced was the issue of “gray literature” or largely unpublished technical reports and fieldwork assessments, which are difficult to access not only by the general public but also by other researchers, including archaeologists. This makes gathering information, potentially stored in multiple archaeological repositories, state and federal agencies, and private Cultural Resource Management firms’ offices time consuming to say the least. This problem was partially mitigated for this study through multiple searches at archaeological repositories, the UNR Special Collections, and directly contacting several individuals who might have access to this information through phone, email, and in person.

The final limitations to this study are that these cooking features, such as ones explored in this thesis, are rarely discovered through pedestrian survey methods. Those that are discovered during survey, like at the Sugar Loaf Site, are often exposed because
they have been disturbed by some type of modern activity. These disturbances include the construction of a road through a site or impacts from mining pits like at the Webber Gravel Pit. Another limitation at the Sugar Loaf site is the relatively small amount of excavation conducted. This excavation was meant to assess damage to the site from the road construction and grazing and was not meant to be an extensive. Subsequent trips to the site have revealed significant erosion of the road is ongoing, which unfortunately appears to be exposing additional rock-lined cooking features. This shows that small excavations might bias the results of a study like this thesis and more features are likely to be present at these sites.

Areas for Further Study

The possibilities for future studies of cooking in prehistoric North America are extensive. First, a standard procedure for recording cooking features would be extremely helpful for collecting uniform data. This should include standards of measurement including depth, diameter, number of cook-stones, and the size and number of FAR/FCR involved. Other valuable information includes presence or absence of charcoal, burnt or oxidized soil, botanical, and faunal remains. Characteristics of the feature that should be recorded include the shape of the pit (deep basin or shallow saucer), whether it rests on soil or bedrock, and nearby boulders which might be used to protect the feature from the wind and other elements. It is also very important to establish the age of these features. Where funding and the presence of charcoal allows, multiple
samples should be submitted for radiocarbon dating. Once certain standards of
recordation are established, more serious investigations of these features can occur.

Future investigations could include the spatial distribution of these sites across
the landscape. In this study, most of the sites do not appear to be long term habitation
sites. An interesting investigation might include how these task-based food processing or
cooking sites fit into the landscape with nearby habitation or hunting sites, as a part of a
seasonal round or other land-use pattern. This might reflect on a potentially confounding
factor of shifting land-use patterns including changing prehistoric boundaries. Further, an
exercise in GIS might reveal average travel times for collecting plants and fuel to be used
in these features.

Some experimental hot-rock ovens have been tested but these experiments
could be expanded and include a variety of cooking feature types, foods, cook-times, and
fuels. This information might reveal more about the efficiency and construction methods
of these features. An interesting experiment could measure the time and caloric
investment needed to create various cooking features, from creating a small flat-oven
versus creating a large, deep rock-lined oven. This could be contrasted with tests on how
many times these ovens could be fired and if having something more permanent like a
rock-lined cooking feature in place could save time for the cook in the long run. Another
potential future study might include how seasonality affects the use of cooking features at
and how it might also shape the design of a site.

It also became apparent that these sites need to be considered as a whole.
While ovens and other cooking features may not contain many faunal or botanical
remains, it often seems that nearby midden dump areas do. Therefore, dump areas might be more reflective of what is being processed in the ovens than the ovens themselves. Radiocarbon dating both the ovens and the midden dumps might help clarify the purpose of these cooking features.

Conclusion

This thesis attempted to examine the development of cooking technology within the traditional Washoe territory in northeastern California and western Nevada, an area centered roughly on Lake Tahoe. What this study found is over 5000 years of hot-rock cooking technology use. Most features were likely used repeatedly and some rock-lined features showed the potential for hundreds of years of use. Cooking appeared at multiple site types, including at habitation sites, within houses, and outside at task-based cooking and food processing locales. Geographically, these features appear ubiquitously across the landscape.

Still, only one site, CA-PLU-1485, contains three large deep rock-lined ovens. This unique site remains an anomaly. Other sites contain small deep ovens, likely used for roasting and bulk processing, but none of the size or caliber of those at CA-PLU-1485. These smaller ovens do show an interesting increase in number after 1000 B.P. However, the cause of this increase is inconclusive. The most common of the feature types is the small flat-oven or grill. This feature type seems to have been a multi-function oven, sometimes used with caps or lids. These features are found throughout the last 5000 years.
Contrary to what archaeology previously portrayed, women and cooking activities are prevalent throughout the landscape in both the domestic and public realms. The sites examined in this thesis show that cooking was an important part of pre-contact life in this area and that multiple types of cooking features were utilized to cook a wide variety of foods. The following points summarize the significant findings of this thesis:

- The Sugar Loaf Site is a small, task-based food processing site.
  - One large rock-lined flat-oven/grill excavated at the site dates to 1370 to 1290 cal B.P.
  - Recent monitoring at the site revealed more FCR/FAR and potential cooking features eroding from the bladed road in the site.
  - Cooking and food processing were likely the primary tasks being completed at the site.

- There is over 5,000 years of evidence of hot-rock cooking within the study area.
  - Research revealed at least 142 cooking features at 22 sites within the traditional Washoe territory.
  - Only one site, CA-PLU-1485 or the Buttes has large deep, rock-lined ovens (over 100 cm in diameter and over 30 cm deep).
  - The most common feature type is the small flat-oven/grill (under 100 cm in diameter and under 30 cm deep).

- There is a clear increase in the number of cooking features before 1000 B.P.
This increase appears to begin around 1500 B.P. but is most substantial after 1000 B.P.

- There are few features dating to after 500 B.P.
- There is no clear evidence of an increase in the use of a previously underutilized or unused resources, including *Camassia quamash*.
  - It is unclear based botanical remains what resources are being processed in these ovens but most appear to be multi-purpose cooking features.
  - Nearby midden should be considered when attempting to assess what was being cooked in these features.

- It is possible to see domestic versus communal/public kitchen areas in the archaeological record. However, many factors should be considered when looking at communal versus domestic kitchens.
  - These factors include not just how many cooking features are present at the site, but also if the features are being used contemporaneously, and the seasonality of use.
  - It is also important to consider the possibility of tribal boundary shifts in prehistory, which may be a confounding factor when trying to understand land-use patterns.

- Women’s activities and cooking are clearly represented in the archaeological record in the study area.
  - Digging sticks, tongs, baskets, woven mats, and other organics do not preserve well in the archaeological record.
However, cooking features, ground stone, and bedrock milling features do preserve and are prominent in the archeological record.

This thesis concludes with a final note on Fire Affected and Fire Cracked Rock for the management of archaeological sites by Cultural Resource Management practitioners. The significance of cooking extends beyond cultural change and technological developments. Surface manifestations of FAR/FCR can be an important management tool when assessing site eligibility for the National Register of Historic Places under the National Historic Preservation Act of 1966. FAR and FCR on the surface of a site is a strong indicator of the presence of a subsurface deposit and suggestive of prehistoric cooking activities. Prehistoric cooking is a completely understudied aspect of archaeology in North America, therefore, sites with FAR/FCR have a strong potential to yield important information to the prehistory of a region, including broad landscape level cultural changes. This alone should make a site eligible for the National Register under Criterion D.
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Hegmon, Michelle  

Heizer, Robert F.  

Heizer, Robert F., and Albert B. Elasser  
Hunt, David

Hutchins, Jim

Hutchins, James, and Dwight D. Simons

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Tuohy, Donald R.

Turner, T.H.
Twiss, Katheryn  

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Verner, Jared, and Kathryn L. Purcell  

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Waechter, Sharon A., and Darren Andolina

Waechter, Sharon A., and Stephen D. Mikesell

Waechter, Sharon A., and William W. Bloomer

Wandsnider, LuAnn

Wegener, Robert M., Jeffery Altschul, Angela H. Keller, and Anne Q. Stoll

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Young, D. Craig
Yu, Pei-Lin

Zeier, Charles D., and Robert G. Elston
### All Cooking Features Within the Study Area

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Location</th>
<th>Cooking Feature Number</th>
<th>Cooking Feature Type</th>
<th>Probable Construction Method</th>
<th>Conventional Radiocarbon Date (BP)</th>
<th>Calibrated Radiocarbon Date (cal. BP)</th>
<th>Size category</th>
<th>Diameter in cm</th>
<th>Depth in cm</th>
<th>Faunal</th>
<th>Botanical</th>
<th>Associated Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-NEV-13/H</td>
<td>Donner Lake, Nevada County, CA</td>
<td>F1</td>
<td>Flat-oven/grill</td>
<td>Rocks are added first, then fire</td>
<td>1270 ± 60</td>
<td>1300 to 1060</td>
<td>Small</td>
<td>56 x 84</td>
<td>Flat</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA-NEV-13/H</td>
<td>Donner Lake, Nevada County, CA</td>
<td>F2</td>
<td>Flat-oven/grill</td>
<td>Rocks are added first, then fire</td>
<td>950 ± 50</td>
<td>950 to 750</td>
<td>Small</td>
<td>74 x 82</td>
<td>-</td>
<td>None</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>CA-PLA-5</td>
<td>Placer County, CA</td>
<td>8</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>1320 ±60</td>
<td>-</td>
<td>Small</td>
<td>60 x 35</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 basalt biface, debitage, fractured hammerstone, 2 ground stone fragments &amp; 4 pieces of FCR</td>
</tr>
<tr>
<td>CA-PLA-163</td>
<td>Squaw Valley, Placer County, CA</td>
<td>1</td>
<td>Indeterminate: Flat-oven/grill or rock-lined oven</td>
<td>Indeterminate</td>
<td>860 ± 40 and 430 ± 40 (Two Samples)</td>
<td>760 &amp; 500 (Two Samples)</td>
<td>Large</td>
<td>not reported</td>
<td>27</td>
<td>None</td>
<td>None</td>
<td>2 handstones and 1 milling slab fragment</td>
</tr>
<tr>
<td>CA-PLA-165</td>
<td>Squaw Valley, Placer County, CA</td>
<td>8</td>
<td>Flat-oven/grill</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>2770 ± 40</td>
<td>2860</td>
<td>Large</td>
<td>130 x 140</td>
<td>15</td>
<td>None</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>CA-PLA-165</td>
<td>Squaw Valley, Placer County, CA</td>
<td>9</td>
<td>Flat-oven/grill</td>
<td>Rocks added first, then fire</td>
<td>2240 ± 40</td>
<td>2320</td>
<td>Small</td>
<td>60 x 16</td>
<td>-</td>
<td>None</td>
<td>None</td>
<td>1 miling slab, 3 ground stone fragments</td>
</tr>
<tr>
<td>CA-PLA-165</td>
<td>Squaw Valley, Placer County, CA</td>
<td>10</td>
<td>Flat-oven/grill</td>
<td>Rocks added first, then fire</td>
<td>2050 ± 40</td>
<td>2000</td>
<td>Small</td>
<td>50 x 40</td>
<td>Flat</td>
<td>None</td>
<td>None</td>
<td>1 miling slab fragment</td>
</tr>
<tr>
<td>CA-PLA-165</td>
<td>Squaw Valley, Placer County, CA</td>
<td>11</td>
<td>Indeterminate: Possible Cook-Stones for oven construction</td>
<td>Possible Cook-Stones Pile</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>60 x 40</td>
<td>-</td>
<td>None</td>
<td>None</td>
<td>1 miling slab fragment</td>
</tr>
<tr>
<td>CA-PLA-165</td>
<td>Squaw Valley, Placer County, CA</td>
<td>12</td>
<td>Indeterminate: Possible Cook-Stones for oven construction</td>
<td>Possible Cook-Stones Pile</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>80 x 40</td>
<td>26</td>
<td>None</td>
<td>None</td>
<td>1 miling slab fragment</td>
</tr>
<tr>
<td>CA-PLA-165</td>
<td>Squaw Valley, Placer County, CA</td>
<td>13</td>
<td>Indeterminate: Possible Cook-Stones for oven construction</td>
<td>Possible Cook-Stones Pile</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>80 x 35</td>
<td>-</td>
<td>None</td>
<td>None</td>
<td>three milling slab fragments</td>
</tr>
<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size Category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
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</tr>
<tr>
<td>CA-PLU-44/Chilcoot</td>
<td>Chilcoot, Plumas County</td>
<td>2</td>
<td>Rock-Lined Oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Rock shelter</td>
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<tr>
<td>CA-PLU-44/Chilcoot</td>
<td>Chilcoot, Plumas County</td>
<td>3</td>
<td>Earth Oven</td>
<td>N/A</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>38</td>
<td>31</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Rock shelter</td>
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<tr>
<td>CA-PLU-130</td>
<td>Mohawk Valley, Plumas County, CA</td>
<td>1</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>1250 ± 40</td>
<td>1260 -1060</td>
<td>Small</td>
<td>90</td>
<td>-</td>
<td>4 small fragments</td>
<td>4 hairgrass, 6 bitterbrush, 1 Poaceae, 4 unidentified seeds</td>
<td>1 millingstone fragment, 1 banded cobble, 1 chert core, 4 bifaces, hundreds of flakes</td>
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<tr>
<td>CA-PLU-130</td>
<td>Mohawk Valley, Plumas County, CA</td>
<td>2</td>
<td>Indeterminate: Partially rock-lined oven</td>
<td>Fire added first, then rocks</td>
<td>910 ± 80</td>
<td>960 - 680</td>
<td>Small</td>
<td>90</td>
<td>48</td>
<td>none</td>
<td>none</td>
<td>2 Brodiaea bulbs, 1 blazing star, 1 plantain, 1 bitterbrush, 1 acorn</td>
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<tr>
<td>CA-PLU-130</td>
<td>Mohawk Valley, Plumas County, CA</td>
<td>3</td>
<td>Indeterminate: Possible Rock-lined oven</td>
<td>Indeterminate</td>
<td>810 ± 40</td>
<td>780 - 670</td>
<td>Small</td>
<td>70 x 28</td>
<td>-</td>
<td>none</td>
<td>none</td>
<td>1 burnt Brodiaea bulb, 2 burnt acorn fragments, 3 Poaceae, 1 unidentified seed, 1 leaf fragment</td>
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<tr>
<td>CA-PLU-226</td>
<td>Mohawk Valley, Plumas County, CA</td>
<td>2</td>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>900 ± 90</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>None</td>
<td>2 pine nut, 1 unidentified</td>
<td>1 mano above feature</td>
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<tr>
<td>CA-PLU-250</td>
<td>Mohawk Valley, Plumas County, CA</td>
<td>1</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>80</td>
<td>40</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<tr>
<td>The Buttes Site</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>1</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>2580 ± 40</td>
<td>2740</td>
<td>Small</td>
<td>80</td>
<td>16</td>
<td>2 mammal, 2 vertebra</td>
<td>3 Poaceae, 1 unidentified seed fragment, 1 pine nut shell</td>
<td>32 pieces of debitage, 1 flake tool</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
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<tr>
<td>The Buttes Site</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>2</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>500 ±70</td>
<td>525</td>
<td>Small</td>
<td>85</td>
<td>22</td>
<td>2 fish, 4 vertebra</td>
<td>22 Poaceae, 3 unidentified seed, 2 Chenopodium</td>
<td>83 pieces of debitage, 1 projectile point, 1 banded cobble</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td></td>
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<tr>
<td>The Buttes Site</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>4</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>69 x 68</td>
<td>15</td>
<td>1 M/L mammal</td>
<td>3 Poaceae</td>
<td>9 pieces of debitage, 1 handstone</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
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</tr>
<tr>
<td>The Buttes Site</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>6</td>
<td>Rock-lined oven</td>
<td>Rocks added first, then fire, then rock cap/lid, possible platform in center</td>
<td>410 ± 90, and 630 ±70 (Two Samples)</td>
<td>490 and 570/580/640 (Two Samples)</td>
<td>Large</td>
<td>300 x 250</td>
<td>90</td>
<td>1 mule deer, 5 S/M mammal, 2 M/L mammal, 1 vertebra</td>
<td>10 Camas bulbs, 1 Hrodiea bulb, 2 unidentified bulb, 27 Phacelia, 3 Poaceae, 1 Poa, 1 Deschampsia, 2 unidentified whole, 12 unidentified fragments, 1 Mentzelia, 1 Vulpia</td>
<td>4 pieces of baked clay, 1 banded cobble, 4 bifaces, 129 pieces of debitage, 5 flake tools, 2 formed flake tools, 1 handstone, 1 manoport, 1 millingstone, 2 mica, ground stone, 1 pebble, 5 projectile points (including a Rose Spring Point)</td>
</tr>
<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
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</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>9</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>-</td>
<td>~50</td>
<td>~50</td>
<td>None</td>
<td>1 Brodiaea bulb, 1 Poaceae</td>
<td>1 piece of baked clay and 1 piece of debitage</td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>12</td>
<td>Rock-Lined Oven</td>
<td>Rocks added first, then fire, platform in center</td>
<td>740 ± 60</td>
<td>670</td>
<td>Large</td>
<td>215 x 190</td>
<td>95</td>
<td>2 squirrel, 1 rabbit, 1 antilocapre, 18 m/l mammal, 7 v/m mammal, 26 vertebrate bones</td>
<td>1 Camus bulb, 3 foxtail, 2 core tools, 1 piece of ochre, 1 drill, 2 formed flake tools, 212 pieces of debitage, 1 manoport, 3 Rose Spring Projectile Points</td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>13</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>810 ±70</td>
<td>710</td>
<td>Small</td>
<td>60</td>
<td>20</td>
<td>1 M/L mammal</td>
<td>6 Deschampsia, 3 Poaceae</td>
<td>5 pieces of baked clay, 1 piece of debitage</td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>14</td>
<td>Rock-Lined Oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>70 x 80</td>
<td>40</td>
<td>None</td>
<td>1 Pine nut shell, 5 Elymus, 5 Poa, 4 Atriplex, 4 Poaceae</td>
<td>2 pieces of debitage</td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>17</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>100</td>
<td>20</td>
<td>None</td>
<td>5 Phacelia</td>
<td>1 piece of debitage</td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>19</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>unknown</td>
<td>-</td>
<td>-</td>
<td>None</td>
<td>7 Poaceae</td>
<td>1 piece of debitage</td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>20</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Rocks added first, then fire</td>
<td>670 ± 40</td>
<td>650</td>
<td>Small</td>
<td>75 x 79</td>
<td>26</td>
<td>2 vertebrate</td>
<td>1 Pine nut shell, 118 pieces of debitage, 1 blade tool, 1 formed blade tool, 1 Small-stemmed arrow point</td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>24</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Flat</td>
<td>-</td>
<td>-60</td>
<td>-</td>
<td>5 Atriplex</td>
<td>4 pieces of debitage</td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>29</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>53 x 58</td>
<td>20</td>
<td>-</td>
<td>-</td>
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<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>30</td>
<td>Indeterminate: Possible Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Large</td>
<td>Unknown</td>
<td>10</td>
<td>1 Brodiaea bulb, 8 Poaceae</td>
<td>1 piece of ground stone, 1 piece of debitage</td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>31</td>
<td>Indeterminate: Possible Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>80 x 84</td>
<td>-</td>
<td>1 M/L mammal</td>
<td>None</td>
<td>2 pieces of debitage</td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>32</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>70</td>
<td>19</td>
<td>3 Elymus, 6 Poaceae</td>
<td>7 Pieces of debitage, 1 handstone</td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/CA-PLU-1485</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>34</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>76 x 80</td>
<td>-</td>
<td>1 M/L mammal, 1 mammal, 14 vertebrate</td>
<td>-</td>
<td>14 pieces of debitage, 1 Rose Spring Point, 1 Millingstone</td>
</tr>
<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
</tr>
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<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>35</td>
<td>Flat-oven/grill</td>
<td>Possibly Fire added first</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>68 x 70</td>
<td>8</td>
<td>1 mammal, 7</td>
<td>1 Unidentified bulb, 2 unident. seeds</td>
<td>4 pieces of debitage, 1 handstone, 1 core tool, 1 flake tool</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>36</td>
<td>Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>80 x 78</td>
<td>-</td>
<td>-</td>
<td>2 Deschampsia</td>
<td>6 pieces of debitage, 1 handstone, 1 millingstone fragment</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>37</td>
<td>Flat-oven/grill</td>
<td>Rocks added first, then fire</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>70 x 67</td>
<td>14</td>
<td>-</td>
<td>2 Brodiaea bulbs, 6 Pine nut shell, 50 Deschampsia, 16 Poaceae, 3 Elymus, 8 unidentified seed fragments, 1 Achrana, 2 Chenopodiaceae</td>
<td>6 pieces of debitage, 1 handstone, 1 millingstone fragment</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>40</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>50 x 55</td>
<td>10</td>
<td>-</td>
<td>10 Poaceae</td>
<td>1 piece of baked clay, 30 pieces of debitage, 1 millingstone fragment &amp; 1 whole pestle</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>46</td>
<td>Rock-Lined Oven</td>
<td>Rocks added first, then fire</td>
<td>640 ± 70 and 1070 ± 60 (Two Samples)</td>
<td>640 and 960 (Two Samples)</td>
<td>Large</td>
<td>160 x 170</td>
<td>50</td>
<td>1 Camas bulb, charred</td>
<td>159 Bitterbrush, 1 Goosefoot, 3 Sunflower, 8 unidentified seed fragments, 4 bifaces, 4 flake tools, 1 hammerstone, 4 millingstone fragments, 1 pestle</td>
<td></td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>50</td>
<td>Rock-Lined Oven</td>
<td>Rocks added first, then fire</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>100</td>
<td>30</td>
<td>-</td>
<td>2 unidentified bulbs, 5 Elymus, 12 Deschampsia, 4 Poaceae, 1 unidentified seed fragment</td>
<td>3 pieces of debitage</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>BM-1</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>35 (partial measurement) x 50</td>
<td>25</td>
<td>-</td>
<td>1 basalt biface</td>
<td>159 Bitterbrush, 1 Goosefoot, 3 Sunflower, 8 unidentified seed fragments, 4 bifaces, 4 flake tools, 1 hammerstone, 4 millingstone fragments, 1 pestle</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>BM-3</td>
<td>Rock-Lined Flat-Oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>87 x 73</td>
<td>less than 40</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA-PLU-1485</td>
<td>Plumas County, CA</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Buttes Site/</td>
<td>Sierra Valley,</td>
<td>7 (2)</td>
<td>Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>70</td>
<td>30</td>
<td>1 Vertebrate</td>
<td>1 Brodina bulb, 5 Phacelia</td>
<td>-</td>
</tr>
<tr>
<td>CA-PLU-1487/H</td>
<td>Plumas County, CA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
</tr>
<tr>
<td>---------------------------</td>
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<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CA-PLU-1487/H</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>2</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>100</td>
<td>-</td>
<td></td>
<td></td>
<td>2 possible fish/scale 2 burnt seeds (unidentified) 1 handstone</td>
</tr>
<tr>
<td>CA-PLU-1487/H</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>3</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>-</td>
<td>3610 +/- 50</td>
<td>Small</td>
<td>-90</td>
<td>-</td>
<td>None</td>
<td></td>
<td>50 bitterbrush, 1 hairgrass, 1 acorn, 1 goosefoot, 2 Poaceae, unidentified burnt seed 4 handstones, 4 millingstones, 1 hammerstone, 1 drill, 1 lemon shaped charmstone, several ground stone fragments</td>
</tr>
<tr>
<td>Sugar Loaf Site</td>
<td>Sierra Valley, Plumas County, CA</td>
<td>10</td>
<td>Indeterminate: Possible Flat-Oven/grill</td>
<td>Rocks added first, then fire</td>
<td>1430 ± 30</td>
<td>1370 to 1290</td>
<td>Large</td>
<td>120 x 100</td>
<td>Flat</td>
<td>None</td>
<td>1 unidentified Grass Seed</td>
<td>1 handstone 6 ground stone fragments, debitage, &amp; one obsidian corner notched projectile point</td>
</tr>
<tr>
<td>SIE-46/Loyalton Rock Shelter (Wilson 1963)</td>
<td>Sierra Valley, CA</td>
<td>No individual feature numbers given</td>
<td>12 ash lenses, Possible result of fire for warmth, direct cooking or earth oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>all 30.5 to 35.6 cm</td>
<td>unknown</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA-SIE-47</td>
<td>Sierra County, CA</td>
<td>1, 3</td>
<td>Indeterminate: Possible Flat-Oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>100</td>
<td>15 to 30</td>
<td>None</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>CA-SIE-47</td>
<td>Sierra County, CA</td>
<td>4</td>
<td>Ash Lens</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>20 x 10</td>
<td>6 to 12</td>
<td>None</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>CA-SIE-47</td>
<td>Sierra County, CA</td>
<td>9</td>
<td>Indeterminate: Possible Flat-Oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Large</td>
<td>200 x 100</td>
<td>25</td>
<td>None</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>CA-SIE-47</td>
<td>Sierra County, CA</td>
<td>10</td>
<td>Indeterminate: Possible Flat-Oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>100</td>
<td>30</td>
<td>None</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>CA-SIE-1059/The Old Webber Gravel Pit</td>
<td>Sierra Valley, Sierra County, CA</td>
<td>1</td>
<td>Rock-Lined Oven</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>-</td>
<td>1050 and 690 (Two Samples)</td>
<td>Small</td>
<td>44</td>
<td>55</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>CA-SIE-1059/The Old Webber Gravel Pit</td>
<td>Sierra Valley, Sierra County, CA</td>
<td>2</td>
<td>Rock-Lined Oven</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>-</td>
<td>960</td>
<td>Small</td>
<td>Over 60</td>
<td>50</td>
<td>-</td>
<td>juniper</td>
<td>mano</td>
</tr>
<tr>
<td>CA-SIE-1059/The Old Webber Gravel Pit</td>
<td>Sierra Valley, Sierra County, CA</td>
<td>3</td>
<td>Flat-oven/grill</td>
<td>Rocks first, then fire</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>65</td>
<td>27</td>
<td>-</td>
<td>juniper</td>
<td>-</td>
</tr>
<tr>
<td>CA-SIE-1059/The Old Webber Gravel Pit</td>
<td>Sierra Valley, Sierra County, CA</td>
<td>-</td>
<td>Rock-Lined Oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>-100</td>
<td>-40</td>
<td>None</td>
<td>None</td>
<td>3 metate fragments</td>
</tr>
<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
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<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Daphne Creek Site/26D037</td>
<td>Daphne Creek, Carson River Drainage</td>
<td>2</td>
<td>Flat-oven/grill</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>460</td>
<td>-</td>
<td>Small</td>
<td>69</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daphne Creek Site/26D037</td>
<td>Daphne Creek, Carson River Drainage</td>
<td>5</td>
<td>Flat-oven/grill</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>365 ± 135</td>
<td>-</td>
<td>Small</td>
<td>75</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daphne Creek Site/26D037</td>
<td>Daphne Creek, Carson River Drainage</td>
<td>8</td>
<td>Flat-oven/grill</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>75</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daphne Creek Site/26D037</td>
<td>Daphne Creek, Carson River Drainage</td>
<td>9</td>
<td>Flat-oven/grill</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daphne Creek Site/26D037</td>
<td>Daphne Creek, Carson River Drainage</td>
<td>16</td>
<td>Flat-oven/grill</td>
<td>Hot rocks are layered with foodstuffs.</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>3</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>92 x 86</td>
<td>15 to 25</td>
<td>None</td>
<td>None</td>
<td>108 pieces of debitage, constructed between 3 large boulders, possible associated fire affected rock associated close by feature which may represent clean-out of feature</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>7</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Large</td>
<td>100 x 132</td>
<td>-</td>
<td>3 bone fragments</td>
<td>None</td>
<td>4 dart-sized points, 10 bifaces, 2 flake tools, 869 pieces of debitage</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>8</td>
<td>Rock-lined Oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>95 x 88</td>
<td>30</td>
<td>2 bone fragments</td>
<td>-</td>
<td>Elko Point, 3 bifaces, 213 pieces of debitage, 2 red ochre,</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>9</td>
<td>Rock-lined Oven / Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>95 x 60</td>
<td>-</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>10</td>
<td>Flat-oven/grill with cap</td>
<td>Hot rocks layered with foodstuffs</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>95 x 60</td>
<td>8 to 11</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>11</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>52 x 44</td>
<td>7</td>
<td>None</td>
<td>None</td>
<td>10 pieces of debitage</td>
</tr>
<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>12</td>
<td>Indeterminate: rockless pit with cap</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>85 x 82</td>
<td>57 including cap</td>
<td>None</td>
<td>None</td>
<td>2 bifaces, 1 unidentified ground stone fragment, 3 mano and 3 metate fragments</td>
</tr>
<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
</tr>
</tbody>
</table>
|----------|----------------|------------------------|--------------------------|------------------------------|-----------------------------------|-------------------------------------|-------------|----------------|------------|--------|-----------|---------------------------------------------------------------------------------------------------------------------------------
<p>| 26Wa99   | Mt. Rose Fan near Reno | 13                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Small       | 74 x 60        | 20         | None   | None      | None                                                                                                                                   |
| 26Wa99   | Mt. Rose Fan near Reno | 14                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Small       | 80 x 85        | 20         | None   | None      | 2 bifaces; 2 modified flakes, 299 pieces of debitage.                                                                                                   |
| 26Wa99   | Mt. Rose Fan near Reno | 15                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Small       | 70 x 73        | 20         | -      | -         | 5 bifaces, 3 flake tools, 369 pieces of debitage, 4 ground stone fragments, 1 basalt core, 1 tested basalt cobble                   |
| 26Wa99   | Mt. Rose Fan near Reno | 16                     | Rock-Lined Oven          | Indeterminate                | undated                           | undated                             | Small       | 72 x 70        | 36         | 1 bone fragment | -         | Martin point/drill, 279 pieces of debitage, 3 millingstones as part of feature                                      |
| 26Wa99   | Mt. Rose Fan near Reno | 17                     | Rock-Lined Oven          | Indeterminate                | undated                           | 990 ±40                             | Small       | 82 x 77        | 33         | -      | -         | -                                                                                                                                     |
| 26Wa99   | Mt. Rose Fan near Reno | 18/19/20/22            | Indeterminate; Possible FCR/FAR discard pile | Indeterminate                | undated                           | undated                             | Large       | 110 x 112      | 18         | -      | -         | 1 drill, 1 biface, 138 pieces of debitage                                                                                              |
| 26Wa99   | Mt. Rose Fan near Reno | 23                     | Earth Oven               | Indeterminate                | undated                           | undated                             | Small       | 42 x 48        | 24         | -      | -         | -                                                                                                                                     |
| 26Wa99   | Mt. Rose Fan near Reno | 21/25                  | Rock-Lined Oven          | Indeterminate                | undated                           | undated                             | Small       | 100 x 92       | 40         | -      | -         | 1 flake tool, 115 pieces of debitage                                                                                                   |
| 26Wa99   | Mt. Rose Fan near Reno | 26                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Large       | 96 x 127       | 4 to 21    | 1 burnt bone fragment | 5 red ochre | 1 corner notched point, 10 bifaces, 2 flake tools, 782 debitage                                                                  |
| 26Wa99   | Mt. Rose Fan near Reno | 28                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Small       | 64 x 64        | 10         | -      | -         | None                                                                                                                                   |
| 26Wa99   | Mt. Rose Fan near Reno | 32                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Large       | 111 x 105      | 5 to 20    | -      | -         | Martin CS Point, 4 bifaces, 2 flake tools, 1 chopper                                                                              |
| 26Wa99   | Mt. Rose Fan near Reno | 36                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Small       | 50 x 50        | 8 to 28    | -      | -         | 1 biface, 1 hammerstone, 1 millingstone fragment                                                                                     |
| 26Wa99   | Mt. Rose Fan near Reno | 37                     | Flat-oven/grill          | Indeterminate                | undated                           | undated                             | Small       | 52 x 80        | 20 to 24   | -      | -         | 1 biface                                                                                                                                |</p>
<table>
<thead>
<tr>
<th>Site Name</th>
<th>Location</th>
<th>Feature Number</th>
<th>Cooking Feature Type</th>
<th>Probable Construction Method</th>
<th>Conventional Radiocarbon Date (BP)</th>
<th>Calibrated Radiocarbon Date (cal. BP)</th>
<th>Size Category</th>
<th>Diameter in cm</th>
<th>Depth in cm</th>
<th>Faunal</th>
<th>Botanical</th>
<th>Associated Artifacts</th>
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<tr>
<td>26Wa99</td>
<td>Mt. Rose Fan near Reno</td>
<td>38</td>
<td>Flat-oven/grill</td>
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<td>undated</td>
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<td>18</td>
<td>-</td>
<td>-</td>
<td>1 biface</td>
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<td>Bordertown</td>
<td>10</td>
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<td>undated</td>
<td>undated</td>
<td>-</td>
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<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>~60</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>undated</td>
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<td>~70</td>
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<td>Large</td>
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<td>34</td>
<td>Cook-stones for boiling</td>
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<td>undated</td>
<td>-</td>
<td>-</td>
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<td>39</td>
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<td>Small</td>
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<td>Bordertown</td>
<td>45</td>
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<td>undated</td>
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<td>48</td>
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<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>~60</td>
<td>20-30</td>
<td>-</td>
<td>-</td>
<td>2 metate fragments, 2 manos, 2 hammerstones, and a conical mortar</td>
</tr>
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<td>49</td>
<td>Flat-oven/grill</td>
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<td>undated</td>
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<td>~90</td>
<td>20-30</td>
<td>-</td>
<td>-</td>
<td>Core in soil above feature</td>
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<td>53</td>
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<td>undated</td>
<td>-</td>
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<td>57</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3 metate fragments</td>
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<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
</tr>
<tr>
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<td>Bordertown</td>
<td>58</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
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<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>~60</td>
<td>20-30</td>
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<td>Bordertown</td>
<td>62</td>
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<td>undated</td>
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<td>67</td>
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<td>Small</td>
<td>~60</td>
<td>20-30</td>
<td></td>
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<td></td>
<td>Several artifacts reported</td>
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<td>Indeterminate</td>
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<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>65 x 45</td>
<td>12</td>
<td>None</td>
<td></td>
<td>1 Brodiaea, 1 Plantain, 6 bitterbrush, 2 acorn, 2 unidentified seeds</td>
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<tr>
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<td>Truckee Meadows, Reno</td>
<td>1</td>
<td>Rock-Lined Oven</td>
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<td>modern</td>
<td>modern</td>
<td>Small</td>
<td>80 x 80</td>
<td>17</td>
<td></td>
<td></td>
<td>Possible cap stones</td>
</tr>
<tr>
<td>26Wa1697</td>
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<td>2</td>
<td>Flat-oven/grill</td>
<td>Indeterminate</td>
<td>1535 ± 80 and 930 ±125 (Two Samples)</td>
<td>-</td>
<td>Large</td>
<td>90 x 115</td>
<td>15</td>
<td>burnt bone fragments, including rabbit</td>
<td>-</td>
<td>Pestle</td>
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<tr>
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<td>Truckee Meadows, Reno</td>
<td>3</td>
<td>Flat-Oven/Grill rocks added first, then fire</td>
<td>510 ± 120</td>
<td>Small</td>
<td>85 x 100</td>
<td>8</td>
<td>None</td>
<td>-</td>
<td>Thermally Altered Chert</td>
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<td>Truckee Meadows, Reno</td>
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<td>Rock-Lined Oven</td>
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<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>90 x 50</td>
<td>15</td>
<td>-</td>
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<td>Flat-oven/grill</td>
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<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>75 x 90</td>
<td>21</td>
<td>Charred rodent, Rabbit bone fragments, Plantain seeds</td>
<td>Burnt hammerstone</td>
<td></td>
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<td>6</td>
<td>Flat-oven/grill</td>
<td>rocks added first, then fire</td>
<td>1375 ± 60</td>
<td>Small</td>
<td>70 x 90</td>
<td>20</td>
<td>None</td>
<td>Plantain seeds</td>
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<td>Handstone</td>
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<td>undated</td>
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<td>60 x 60</td>
<td>20</td>
<td>None</td>
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<td>None</td>
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<td>880 ± 80</td>
<td>-</td>
<td>Small</td>
<td>60 x 60</td>
<td>20</td>
<td>Artiodactyl tooth fragment</td>
<td>None</td>
<td>Possible cap stones</td>
</tr>
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<td>-</td>
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<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size Category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Faunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
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<td>11</td>
<td>Flat-oven/grill</td>
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<td>797 ± 100</td>
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<td>70 x 77</td>
<td>22</td>
<td>-</td>
<td>-</td>
<td>2 millingstones, 1 hammerstone, 1 bifacial, 1 core fragment, possible cap stone</td>
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<td>10</td>
<td>-</td>
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<td>Charred bone (rodent, rabbit, fish)</td>
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<td>Decaying mammal remains</td>
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<td>50 x 59</td>
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<td>Small</td>
<td>40 x 40</td>
<td>15</td>
<td>-</td>
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<td>None</td>
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<td>19</td>
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<td>Fire added first, then cook-stones</td>
<td>830 ±150 and 340 ±75 (Two Samples)</td>
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<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>65 x 65</td>
<td>10</td>
<td>Leporida, Rodentia, and insect</td>
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<tr>
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<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>40 x 40</td>
<td>6</td>
<td>-</td>
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<td>Truckee Meadows, Reno</td>
<td>22</td>
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<td>undated</td>
<td>Small</td>
<td>80 x 60</td>
<td>10</td>
<td>3 unidentified burnt bone fragments</td>
<td>None</td>
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<td>26W2065</td>
<td>Glendale site, Reno, NV</td>
<td>28</td>
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<td>undated</td>
<td>Small</td>
<td>86 x 92</td>
<td>20 to 22</td>
<td>none noted</td>
<td>none noted</td>
<td>Possibly associated with Feature 50, a ground stone concentration nearby. Found within a house pit (Feature 27)</td>
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<tr>
<td>Site Name</td>
<td>Location</td>
<td>Cooking Feature Number</td>
<td>Cooking Feature Type</td>
<td>Probable Construction Method</td>
<td>Conventional Radiocarbon Date (BP)</td>
<td>Calibrated Radiocarbon Date (cal. BP)</td>
<td>Size category</td>
<td>Diameter in cm</td>
<td>Depth in cm</td>
<td>Fauunal</td>
<td>Botanical</td>
<td>Associated Artifacts</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>----------------------</td>
<td>------------------------------</td>
<td>-------------------------------------</td>
<td>---------------------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-------------</td>
<td>---------</td>
<td>-----------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>26Wa2065 Glendale site</td>
<td>Glendale Ave, Reno, NV</td>
<td>35</td>
<td>Indeterminate: Unlined pit with blacked rocks on one edge</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>45 x 55</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Rose Spring Contracting Stem</td>
</tr>
<tr>
<td>26Wa2065 Glendale site</td>
<td>Glendale Ave, Reno, NV</td>
<td>42</td>
<td>Indeterminate: Rock-Lined Oven or Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Large</td>
<td>110 x 97</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Pit contains charcoal and 2 hammers, 1 mano and an unidentified ground stone fragment along with unmodified rocks along the edge of the pit.</td>
</tr>
<tr>
<td>26Wa2065 Glendale site</td>
<td>Glendale Ave, Reno, NV</td>
<td>62</td>
<td>Indeterminate: Earth Oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>61 x 35</td>
<td>14</td>
<td>Bone noted</td>
<td>Charcoal noted. Mano and unidentified ground stone fragment.</td>
<td></td>
</tr>
<tr>
<td>26Wa2065 Glendale site</td>
<td>Glendale Ave, Reno, NV</td>
<td>82</td>
<td>Indeterminate: Flat-Oven/Grill</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Found in same stratum as a basin metate and ground stone aggregation (Feature 78). Also associated with Feature 79: a pit filled with ground stone &amp; unmodified rocks.</td>
</tr>
<tr>
<td>26Wa3017 Vista Site</td>
<td>Vista Site, Reno, NV</td>
<td>4</td>
<td>Indeterminate: Possible grill or collection of FCR</td>
<td>Indeterminate</td>
<td>830 ± 60</td>
<td>-</td>
<td>Small</td>
<td>~40</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Several ground stone fragments</td>
</tr>
<tr>
<td>26Wa3017 Vista Site</td>
<td>Vista Site, Reno, NV</td>
<td>14</td>
<td>Rock-Lined Oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Small</td>
<td>100</td>
<td>-</td>
<td>None</td>
<td>-</td>
<td>2 millingstones, 5 handstones, 1 with red ochre</td>
</tr>
<tr>
<td>26Wa3017 Vista Site</td>
<td>Vista Site, Reno, NV</td>
<td>37/66</td>
<td>Indeterminate: Rock-Lined Oven</td>
<td>Indeterminate</td>
<td>undated</td>
<td>undated</td>
<td>Large</td>
<td>200</td>
<td>-</td>
<td>None</td>
<td>1 Atripex</td>
<td>Ground stone fragments</td>
</tr>
<tr>
<td>26Wa3017 Vista Site</td>
<td>Vista Site, Reno, NV</td>
<td>38</td>
<td>Indeterminate: Rock-Lined Oven</td>
<td>Indeterminate</td>
<td>930 ± 150</td>
<td>-</td>
<td>Large</td>
<td>150</td>
<td>-</td>
<td>None</td>
<td>1 Amaranthus, 3 Chenopodiaceae, 1 Atriplex, 2 unidentified</td>
<td>1 Mortar</td>
</tr>
<tr>
<td>26Wat6872 Hungry Valley</td>
<td>Hungry Valley</td>
<td>1</td>
<td>Rock-Lined Oven</td>
<td></td>
<td>Rocks added first, then fire</td>
<td>610 ± 70</td>
<td>597</td>
<td>Small</td>
<td>60 x 55</td>
<td>18</td>
<td>None</td>
<td>Amaranthus, Rush, Tule, Goosefoot</td>
</tr>
</tbody>
</table>
### Plant List from the Sugar Loaf Site Highlighting Ethnographically Important Plants

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Washo Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FORBS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Achillea millefolium</em></td>
<td>common yarrow</td>
<td>Wemsi?</td>
</tr>
<tr>
<td>Agoseris ssp</td>
<td>false dandelion</td>
<td></td>
</tr>
<tr>
<td>Arnica sororia</td>
<td>twin arnica</td>
<td></td>
</tr>
<tr>
<td><em>Crepis acuminata</em></td>
<td>tapertip hawksbeard</td>
<td></td>
</tr>
<tr>
<td>Descurainia spp.</td>
<td>tansy mustard</td>
<td></td>
</tr>
<tr>
<td><em>Dieteria canescens var. canescens</em></td>
<td>hoary aster</td>
<td></td>
</tr>
<tr>
<td>Eriastrum sparsiflorum</td>
<td>Great Basin woolstar</td>
<td></td>
</tr>
<tr>
<td><em>Erigeron ssp.</em></td>
<td>fleabane</td>
<td></td>
</tr>
<tr>
<td>Eriogonum baileyi</td>
<td>Bailey’s buckwheat</td>
<td></td>
</tr>
<tr>
<td>Heterotheca villosa var. minor</td>
<td>hairy false goldenaster</td>
<td></td>
</tr>
<tr>
<td>Phacelia hastata var. hastata</td>
<td>silverleaf phacelia</td>
<td></td>
</tr>
<tr>
<td><em>Rumex crispus</em></td>
<td>curly dock</td>
<td></td>
</tr>
<tr>
<td><em>Rumex salicifoliis</em></td>
<td>willow dock</td>
<td></td>
</tr>
<tr>
<td>Stephanomeria spinosa*</td>
<td>spiny skeletonweed</td>
<td></td>
</tr>
<tr>
<td><em>Taraxacum officinale</em></td>
<td>common dandelion</td>
<td></td>
</tr>
<tr>
<td><strong>GRASSES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Achnatherum hymenoides</em></td>
<td>indian ricegrass</td>
<td></td>
</tr>
<tr>
<td><em>Achnatherum spp.</em></td>
<td>needlegrass</td>
<td></td>
</tr>
<tr>
<td><em>Bromus carinatus</em></td>
<td>mountain brome</td>
<td></td>
</tr>
<tr>
<td><em>Bromus tectorum</em></td>
<td>cheatgrass</td>
<td></td>
</tr>
<tr>
<td><em>Leymus cinereus</em></td>
<td>Great Basin wild rye</td>
<td></td>
</tr>
<tr>
<td><strong>SHRUBS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Amelanchier alnifolia</em></td>
<td>Saskatoon serviceberry</td>
<td></td>
</tr>
<tr>
<td><em>Artemisia tridentate var. wyomingensis</em></td>
<td>Wyoming big sagebrush</td>
<td></td>
</tr>
<tr>
<td><em>Chryssothamnus viscidiflorus</em></td>
<td>yellow rabbitbrush</td>
<td>Bo'p'o'?</td>
</tr>
<tr>
<td><em>Prunus virginiana</em></td>
<td>common chokecherry</td>
<td></td>
</tr>
<tr>
<td><em>Pruslia tridentata var. tridentata</em></td>
<td>antelope bitterbrush</td>
<td>Balnac’an</td>
</tr>
<tr>
<td><em>Rhamnus rubra</em></td>
<td>red buckthorn</td>
<td></td>
</tr>
<tr>
<td><em>Rosa woodsii var. ultramontana</em></td>
<td>Wood’s rose</td>
<td>PePec’umeli?</td>
</tr>
<tr>
<td><em>Salsola tragus</em></td>
<td>Russian thistle</td>
<td></td>
</tr>
<tr>
<td><em>Tetradymia canescens</em></td>
<td>gray horsebrush</td>
<td></td>
</tr>
</tbody>
</table>

152
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Washo Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TREES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Juniperus occidentalis var.occidentalis</em></td>
<td>western juniper</td>
<td>?Imaha’wa? or P’á’l</td>
</tr>
<tr>
<td><em>Pinus jeffreyi</em></td>
<td>Jeffery pine</td>
<td>Ma’daš dewdi ?iš</td>
</tr>
<tr>
<td><em>Quercus kelloggii</em></td>
<td>California Black Oak</td>
<td></td>
</tr>
</tbody>
</table>

* Known important ethnobotanical plant resource based on The Washoe Cultural Office 2009.
° Invasive Species.
July 2, 2013

Dr. Marilla M. Baker
Bureau of Land Management
Eagle Lake Field Office
2950 Riverside Drive
Susanville, CA 96130

RE: Radiocarbon Dating Results For Samples SIE23152101 Cat.26, SIE23152101 Cat.51, SIE23152101 Cat.101

Dear Dr. Baker:

Enclosed are the radiocarbon dating results for three samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. The report sheet contains the dating result, method used, material type, applied pretreatment and two-sigma calendar calibration result (where applicable) for each sample.

This report has been both mailed and sent electronically, along with a separate publication quality calendar calibration page. This is useful for incorporating directly into your reports. It is also digitally available in Windows metafile (.wmf) format upon request. Calibrations are calculated using the newest (2004) calibration database. References are quoted on the bottom of each calibration page. Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Examining the calibration graphs will help you understand this phenomenon. Calibrations may not be included with all analyses. The upper limit is about 20,000 years, the lower limit is about 250 years and some material types are not suitable for calibration (e.g. water).

We analyzed these samples on a sole priority basis. No students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

Information pages are enclosed with the mailed copy of this report. They should answer most of questions you may have. If they do not, or if you have specific questions about the analyses, please do not hesitate to contact us. Someone is always available to answer your questions.

The cost of the analysis was charged to the MASTERCARD card provided. As always, if you have any questions or would like to discuss the results, don’t hesitate to contact me.

Sincerely,

[Signature]

Page 1 of 5
# REPORT OF RADIOCARBON DATING ANALYSES

Dr. Marilla M. Baker  
Bureau of Land Management  

Report Date: 7/2/2013  
Material Received: 6/24/2013

<table>
<thead>
<tr>
<th>Sample Data</th>
<th>Measured Radiocarbon Age</th>
<th>13C/12C Ratio</th>
<th>Conventional Radiocarbon Age(*)</th>
</tr>
</thead>
</table>
| Beta - 351726  
SAMPLE: SIE23152101 Cat.26  
ANALYSIS: AMS-Standard delivery  
MATERIAL/PRETREATMENT: (charred material): acid/alkali/acid  
2 SIGMA CALIBRATION: Cal AD 1680 to 1730 (Cal BP 270 to 220) AND Cal AD 1810 to 1930 (Cal BP 140 to 20)  
Cal AD Post 1950 | 80 +/- 30 BP | -24.1 o/oo | 90 +/- 30 BP |
| Beta - 351727  
SAMPLE: SIE23152101 Cat.51  
ANALYSIS: AMS-Standard delivery  
MATERIAL/PRETREATMENT: (charred material): acid/alkali/acid  
2 SIGMA CALIBRATION: Cal AD 1640 to 1670 (Cal BP 310 to 280) AND Cal AD 1780 to 1800 (Cal BP 170 to 150)  
Cal AD 1940 to post 1950 (Cal BP 10 to post 1950) | 220 +/- 30 BP | -23.5 o/oo | 240 +/- 30 BP |
| Beta - 151128  
SAMPLE: SIE23152101 Cat.101  
ANALYSIS: AMS-Standard delivery  
MATERIAL/PRETREATMENT: (charred material): acid/alkali/acid  
2 SIGMA CALIBRATION: Cal AD 580 to 660 (Cal BP 1370 to 1290) | 1430 +/- 30 BP | -24.0 o/oo | 1430 +/- 30 BP |

*Dates are reported as RCYBP (radiocarbon years before present, “present” = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by **. The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the “Two Sigma Calibrated Result” for each sample.
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 ~ -24.1; lab. mult = 1)

Laboratory number: Beta-351726

Conventional radiocarbon age: 90±30 BP

2 Sigma calibrated results: (95% probability)
Cal AD 1680 to 1730 (Cal BP 270 to 220) and
Cal AD 1810 to 1930 (Cal BP 140 to 20) and
Cal AD Post 1950

Intercepts with calibration curve:
Cal AD 1890 (Cal BP 60) and
Cal AD 1910 (Cal BP 40) and
Cal AD Post 1950

1 Sigma calibrated results: (68% probability)
Cal AD 1690 to 1730 (Cal BP 260 to 220) and
Cal AD 1810 to 1840 (Cal BP 140 to 110) and
Cal AD 1840 to 1850 (Cal BP 110 to 100) and
Cal AD 1860 to 1860 (Cal BP 90 to 90) and
Cal AD 1870 to 1920 (Cal BP 80 to 30) and
Cal AD Post 1950

References:

Database used
INTCAL09

References to INTCAL09 database

Mathematics used for calibration scenario
A Simplified Approach to Calibrating C14 Dates

Beta Analytic Radiocarbon Dating Laboratory
4965 SW 74th Court, Miami, Florida 33155 • Tel: (305) 667-5167 • Fax: (305) 663-0964 • E-Mail: beta@radiocarbon.com
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -23.5; lab. mult = 1)

Laboratory number: Beta-351727

Conventional radiocarbon age: 240±30 BP

2 Sigma calibrated results:
- Cal AD 1640 to 1670 (Cal BP 310 to 280) and
- Cal AD 1780 to 1800 (Cal BP 170 to 150) and
- Cal AD 1940 to post 1950 (Cal BP 10 to post 1950)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1650 (Cal BP 300)

1 Sigma calibrated results:
- Cal AD 1650 to 1670 (Cal BP 300 to 280) and
- Cal AD 1780 to 1800 (Cal BP 170 to 160) and
- Cal AD 1950 to 1950 (Cal BP 0 to 0)

References:
Database used: INTCAL09

References to INTCAL09 database

Mathematics used for calibration scenario
- A Simplified Approach to Calibrating C14 Dates

Beta Analytic Radiocarbon Dating Laboratory
4965 SW 74th Court, Miami, Florida 33155 • Tel: (305) 607-2107 • Fax: (305) 605-6064 • E-Mail: beta@radiocarbon.com

Page 4 of 5
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

Variables: C13/C12 = -24.7; lab. mult = 1

Laboratory number: Beta-351728

Conventional radiocarbon age: 1430±30 BP

2 Sigma calibrated result: Cal AD 580 to 660 (Cal BP 1370 to 1290)
(95% probability)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 640 (Cal BP 1310)

1 Sigma calibrated result: Cal AD 600 to 650 (Cal BP 1350 to 1300)
(68% probability)

References:

Database used

INTCAL09

References to INTCAL09 database

Heaton et al., 2009, Radiocarbon 51(4):1151-1164, Reimer et al., 2009, Radiocarbon 51(4):1111-1150,


Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates


Beta Analytic Radiocarbon Dating Laboratory

4065 S.W. 74th Court, Miami, Florida 33155 • Tel: (305) 667-3167 • Fax: (305) 663-0964 • E-Mail: beta@radiocarbon.com