INDIAN RUINS:
A COMPREHENSIVE APPROACH TO ROCK RING RESEARCH

by

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In

Cultural Resource Management

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INDIAN RUINS: A COMPREHENSIVE APPROACH TO ROCK RING RESEARCH

Thesis by
Alden Ramsey Neel

ABSTRACT

Purpose of the Study:

This thesis examined previous archaeological investigations, ethnographies, lithic material, projectile points, other artifacts, and spatial patterns to identify themes in the data with the purpose of identifying a range of possible functions and temporal periods of human occupation. Rock ring sites occur across much of California, Oregon, Nevada, and Baja Mexico. The sites investigated for this study are located in Northeastern California, more specifically the western shore of Eagle Lake. The purpose of this investigation was to provide more conclusive evidence to identify a range of possible functions and to test Garth (1953) and local archaeologists’ assertions that these features represent the remains of summer habitation structures. This investigation used transhumance (seasonal upland migration) and ecological cultural edge theory to explain why groups traveled to Eagle Lake seasonally and what tangible and intangible resources attracted them. This investigation also developed methods and procedures to record these features in a manner that generates data for broader comparative analysis and interpretations.

Procedure:

Sixty-one rock rings were investigated across seven miles of shoreline and six different sites. Surface scrapes were used inside and outside of the ring features to locate artifacts that would suggest their function and temporal periods of use. Construction qualities were recorded to identify the range in interior and exterior diameters, wall heights, course heights, and construction material to determine different feature types and if they functioned in different capacities. Spatial patterns of intra-site layout were also investigated to identify possible cultural behaviors.

Findings:

The results of this thesis found that the rock rings in the Eagle Lake Basin functioned as Garth (1953) suggested in his description of summer habitation structures. There is also evidence that rock rings also functioned as specialized plant processing stations, but the evidence is small. To provide relative dates, diagnostic projectile points were examined in correlation with previous temporal sequences developed by Pippen et al. (1978), McGuire (2002), Delacorte (1997a), and other investigations, leading to the conclusion that the rock rings were first
used during the latter part of the Middle Archaic Period (3500-1300 B.P.). These rock ring features were most intensively used during the Later Archaic Period (1300-600 B.P.) because most of the previous investigations date the rock rings to this period and because the projectile points found during this investigation suggest this occupation period. During the Terminal Prehistoric (600 B.P. to European Contact), evidence suggests that rock rings were not being used with the same intensity as during the previous period. Data from both this thesis and other research support this claim, with a drastic lack of Desert side-notch projectile points, the hallmark projectile point type of this period.

Conclusions:

Rock ring features in the Eagle Lake Basin functioned as the remnants of summer habitation structures that were part of a transhumance adaptive strategy to obtain the array of seasonal edible resources that could be found in the Eagle Lake Basin. The Eagle Lake Basin was also important as a cultural edge, where groups met to share tangible and intangible resources. This allowed groups to obtain resources that they could not obtain in their own territories, such as prized tool stone obsidian. In addition, knowledge and information was also exchanged, which allowed groups to be flexible during times of adversity and environmental collapse.

Chair: __________________________

Signature

MA Program: Cultural Resource Management
Sonoma State University                      Date: __________________________
ACKNOWLEDGEMENT

This work is dedicated to my father, Alex, and mother, Kathi. My father exposed me to archaeology, anthropology, and history at a very young age, which cemented my life goals and inspired me to pursue a career in archaeology. He also gave me a significantly creative mind; it is unknown if it was genetic or learned. My mother has groomed/shaped me with love and hard love at times, to turn me into responsible and respectable man, which I am proud of every day. She also made it possible for me to be able to obtain an education financially and gave me a never-give-up attitude.

Love you both with all my heart.

Without the help of so many people, the project might not have happened. I learned, laughed, and enjoyed all the time spent with the following people who helped me with almost all aspects of this thesis. I am in debit to many of these people who helped with the project.

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I owe thanks to Jamie Moore and Dr. Alexis Boutin. Jamie was the first person to give me a job in archaeology; he has taught me lithic analysis, and was willing to help me design, perform, and analyze many aspects of this thesis. Jamie has been a mentor to me over the years in the US Forest Service and for this thesis. Alexis Boutin was a huge help in making comments and edits to my thesis; without her contribution, I would have likely needed to spend another semester working on this project. So thank you both.

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Chapter 1

Introduction

This thesis used prehistoric rock ring feature measurements, door orientations, spatial patterning, lithic analysis, oral histories, and ethnographies to find patterns in the data with the purpose of identifying a range of possible functions and identified temporal period of use. The project also developed methods and procedures to record these features in a manner that generates data for broader comparative analysis and interpretation.

The basic problem with research on prehistoric rock rings in California and the Great Basin is that all features constructed out of rock with a semicircular pattern are lumped together. Known or hypothetical uses of rock rings vary from fire hearths, pinion roasting, geophytes or other root storage and roasting pits, to hunting blinds, dehydration stations, fishing traps, habitation anchors, and windbreaks. These activities are drastically different, and the possible uses of rock rings need to be clarified by developing a working typology that can be used to evaluate the different potential functions on a site-by-site basis. It also is important to note that the uses of rock rings have changed over time and are continually changing. In modern days, some of the ring features have been altered and used as waterfowl hunting blinds and for storing material such as firewood. This means that at any given site, rock rings may have served a range of functions over time.

Rock rings are described as circular to oval shaped features, constructed out of local rock material. These features often come in varying sizes, which has led archaeologist to use size to differentiate between possible use functions. These features also have varying construction qualities and methods, which also provides evidence for function, intervals of use, and cultural behaviors.
Sites selected for this project are located in Northeastern California at Eagle Lake, in the Eagle Lake Osprey Management Area. There is a concentration of rock ring sites along the western shore of Eagle Lake, which continues along many of the major drainages to the west of the lake. The sites spread across approximately 1600 acres of lakefront property that would otherwise be optimal for recreation activities. Though very few have been evaluated, the United States Department of Agriculture is currently protecting these sites. Access is restricted from April to September and there are no formal roads into the area. This has afforded the rock ring sites extra protection because it is extremely hard to access and to move around in the area.
Figure 1.1. Project Vicinity Map.
Some archaeologists, citing brief references in earlier ethnographic texts (e.g., Garth 1953), have proposed that the Eagle Lake rock ring features are the structural remains of summer upland hunting and gathering habitation sites (DeGeorgey 2006; Pippen et al. 1979; Friedman 1977). Summer habitation structures were circular enclosures of brush or juniper limbs and rock, ranging in diameter from ten to fifteen feet across with an opening facing the east (Garth 1953:144). According to Pippin et al. (1979:99), “. . . these rock rings appear to fit Garth’s (1953) description of Atsugewi summer camp brush structures.” Despite these conclusions, there has never been a widespread and comprehensive test of these assertions. These features have varied wall construction qualities, sizes, and shapes. However, very little is known about their functions and temporal periods of construction and use in the Eagle Lake Basin.

Another goal of this project is to add to the preservation of this important area by generating a functional typology and baseline chronology for Eagle Lake rock ring features, with an additional database of associated artifact types and other materials. These data will be used to evaluate some of the rock ring sites for nomination to the National Register, demonstrating under which criteria these sites are significant and to what research questions they contribute useful information.

This thesis has developed a methodology for testing the range of potential functions for the Eagle Lake rock ring features, beginning with DeGeorgey’s and Pippin et al.’s assertions that these sites represent seasonal summer hunting and gathering habitation areas. Construction categories such as interior diameter, wall height, number of courses, and door orientation are used to define and delineate differences between ring features. Ethnographic descriptions, spatial relationships, connections to other sites and
ancient and modern lake levels, projectile typologies, and oral histories also help
determine the range of potential functions and define potential periods of site
construction and use. This project also has created a rock ring feature recording form.
This will standardize the gathering of useful information. A database has been created to
document additional available information across the forest and the region. The database
will be uploaded into the Forest Service storage drive to allow other districts and forests
to use and add to the data set. The database will help guide Forest Service archaeologists
and students in generating interpretations of additional sites on a larger scale.

**Research Questions**

The following questions are designed to further archaeologists’ understanding of
rock ring features along the western shore of Eagle Lake.

1) Rock rings were investigated to test Garth’s (1953) and other local
archeologist’s assertions that the rock ring features functioned as structure
anchors for upland summer hunting and gathering camps. Associated artifacts,
previous investigations of rock ring sites, ethnographic accounts, and spatial
analysis were used to identify other possible functions that the rock ring
features represent.

2) Spatial analysis was used to test for statistically significant spatial patterns
between intra-site ring features. This was compared with ethnographic
accounts to identify possible behaviors or cultural practices that could be
associated with the sites. The sites were tested to see if they show a statistically
significant clustered layout and how and to determine how they correlate with
the modern lake level or older visible terraces.
3) Projectile points, previous investigations, and the literature review were used together to place the sites into Northeastern California taxonomic/temporal sequence. Diagnostic tools and projectile point typologies were used to place these sites into that temporal sequence.

4) Rock ring feature measurements were analyzed to identify differences in construction methods and to identify if there are different construction types or if they follow a uniform design.

**Chapter Overviews**

Chapter 2 describes the environmental setting of the project area and the region. It also includes an exhaustive discussion on edible resources used by prehistoric native Californian tribes in the area. This chapter sets up the reasons for why the transhumance migration and cultural and ecological edge theoretical framework fits with this project. Chapter 3 consists of a literature review that focuses on different known functions and interpretations of rock ring sites and features across California, the Great Basin Region, and Baja California, Mexico. It sets up the foundation for expected associated artifacts and settings for the proposed rock ring categories. It also includes information on the theoretical framework used for this investigation, which primarily focuses on ecological and cultural edge theory and seasonal upland migration and identifies reasons that these strategies were important to many native Californian tribes in the region. Chapter 4 is an overview of previous research rock ring research in the Eagle Lake Basin, both regionally and locally. It discusses periods of human occupation by reviewing both Pippen et al. (1979) and McGuire (2007) at a local and regional perspective. Also provided are an ethnographic review of habitation structures and features constructed out of rock and an
archaeological review of previously excavated rock ring sites in the Eagle Lake vicinity.

Chapter 5 introduces and describes each site investigated for the project. This chapter
describes field methods, lab methods, and decisions made in the field during the course of
the project. It also includes full expectations of possible functions and artifacts that
should be associated with different types of ring features (habitation area, hunting blind,
dehydration station, and religious/ceremonial). Chapter 5 discusses the results of the
project. It includes the range of sizes, wall height, course height, opening orientation of
rock rings, description of average ring and outliers, overall rock ring construction
qualities, associated artifacts, spatial relationships between ring features, relationships
between distance from the lake and forest exposure, description of sourcing results, and a
review of diagnostic and non-diagnostic artifacts recovered. Chapter 6 concludes the
thesis by describing the conclusion of this analysis and makes recommendations for
future rock ring research in the Eagle Lake Basin and beyond.
Chapter 2

Environmental Setting

This project is located in Northeastern California, in the Eagle Lake Basin. The study sites are scattered along the western shore of Eagle Lake, directly to the south of the resort town of Spaulding Tract. It is located at the southernmost ends of the Cascade Range and the Modoc Plateau. The Sierra Nevada Mountains are located to the west and south of the area. The local geology is made up of block faulted Cenozoic basalt flows, smaller rhyolitic domes, and shield volcanoes. Eagle Lake is the second largest natural lake completely in California, formed by melting glaciers during the last Ice Age. It measures approximately 13 miles from north to south, and averages 3 miles east to west. The lake covers more than 22,000 acres and has over 100 miles of shoreline (Schoenherr 1992:6). It is relatively shallow, with depths averaging 9 feet at the north end and a maximum depth of 98 feet at the south end. The main tributary that flows into Eagle Lake is Pine Creek. Pine Creek’s headwaters start 38 miles away at Upper Stephens meadows. The annual rainfall of the Eagle Lake region averages 80 inches with abundant winter snow (Schoenherr 1992:6). The average temperature in the area ranges from 22 to 93 degrees Fahrenheit (Schoenherr 1992:6).
The project area is situated along the ecotones of a mixed conifer forest comprised of Ponderosa pine (*Pinus ponderosa*) and Jeffery pine (*Pinus jeffreyi*) and sage (*Arcestaphylos sp*) and mixed meadow grasses. According to Lightfoot et al. (2009:278), other environmental zones associated with the region are riparian woodland, freshwater
marshes, pinyon-juniper woodland, and arid sagebrush country of the Great Basin. The
understory includes various shrubs, sagebrush, rabbit brush, manzanita, and various
species of ceanothus. Other notable plants are camas, bear grass, California maiden hair
fern, desert parsley, dogbane, epos, and fiddle neck.

The key animal and plant resources to the aboriginal groups can be broken up into
fish, mammals, birds, and plant resources. This section highlights the important plant and
animal species and hunting and collecting techniques used by aboriginal groups in the
Eagle Lake Basin. The lengthy detailed analysis of edibles plants and animals was
included to provide support for seasonal upland migration by showing the abundant
environmental diversity of the Eagle Lake and to show that the Eagle Lake region has
many aspects of an ecological and cultural edge. Both ecological and cultural edge theory
and seasonal upland migration are defined and discussed in Chapter 3.

Fish

Eagle Lake is home to many different fish species; most notable is the Eagle Lake
tROUT (Oncorhynchus mykiss aquilarim). Aboriginal groups in the area relied heavily on
fish for food (Garth 1953:135). During the spring, trout swarmed out of Eagle Lake into
Pine Creek and other small tributaries to spawn. According to Garth (1953:135),

Parties of fishermen awaited them on the banks, spearing them, setting
small gill nets for them overnight, or dipping them out with loosely woven
baskets or dip nets. At times the fish were so numerous that a man impaled
two or three on his spear at one thrust, and along Pine Creek . . . a man
could catch fish with his hands and throw them out on the bank.

The fish coming out of Eagle Lake were often 1 to 1½ feet long and often fat
(1953:136). Even in modern times, these trout have rather robust builds. The heads of the
fish were cut off and they were split down the back to remove the backbone and guts in
preparation for drying (1953:136). The fish were strung along a pole that was placed between two trees. Once the fish were dried, they were tied into small bales with skunkbrush cordage and stored in pits or in the cookhouse, for the winter (1953:136).

Other important fish species that were taken were Tui chub (*Gila bicolor*), Lahontan red-side shiners (*Richardsonius egregius*), Sacramento sucker (*Catostomus occidentalis*), and Tahoe suckers (*Catostomus tahoensis*). The ethnographic record highlights the importance of the Tahoe sucker and Eagle Lake trout to the people who inhabited these lands (Powers 1877:268-269). Tahoe suckers were a staple food, being relatively large fresh water fish and easily extracted. Both the Tahoe and Sacramento sucker can reach a length of eighteen inches and weigh five pounds (Foster 2011:4). Between January and July, the Sacramento sucker travels up the creeks and rivers to spawn in the shallow gravels. During this period, they were easily caught in fish weirs and traps. Some of the traps were constructed out of stone and had a labyrinth design. Once the fish traveled into the trap, it was closed and the fish caught inside its walls. The remains of such fish traps can still be found on Pine Creek and other tributaries in the Northeastern California. According to informants, it was common to catch a hundred fish in one trap (Foster 2011:5). The fish were sun dried and ground up into a flour consistency or smoked. The processed fish could last from several months to a year.

Foster (2011:6) argues that these features were more than just traps, that they were a form of resource management (similar to the burning, pruning, and coppicing of vegetation). If the indigenous people were building traps to corral the fish, all they would need is an outer wall. The construction of the inner chamber acted to enhance the spawning gravels. The most important subsistence practice in traditional life for these
indigenous groups was to maintain the traps and keep them clean and in working condition (Foster 2011:7). Enhancing the spawning gravels helped trout species by providing them with sucker eggs on their later spawning runs. Once they harvested enough suckers, they reopened the traps and allowed the rest to be free. According to Lightfoot et al. (2009:283), “These fish traps are part of a broader strategy of resource conservation that Indians employ to manage the Sacramento sucker population as a fishery.”

Another technique of collecting fish was to use ground wild parsley to poison fishing holes (Garth 1953:137). The stream was dammed, and the wild parsley was added, turning the water turn blue. The fish would float to the surface belly first, where they could be collected in baskets or dip nets (1953:137). The Atsuge at Eagle Lake used gill nets that measured 15 to 30 feet long and about 3 feet tall. The gill nets were pulled together to trap the fish and make it easier to spear them. Aboriginal inhabitants who frequented Eagle Lake and Pine Creek also collected minnows, which they caught in fine-meshed nets when the water was low. Minnows were roasted in hot ashes and eaten whole (1953:136). Fish eggs were dried, pounded, and made into mush.

**Mammals**

Deer were the most prized game animal and considered a source of wealth and prestige. The array of different ways deer were hunted shows their importance. Hunters used a dear head disguise as a way to draw deer in and get closer to them without startling the deer (Garth 1953:132). According Garth (1953:132), “If the hunter was fortunate he might shoot two or three deer before they were frightened.” The danger was that sometimes mountain lions would attack the hunter when disguised as a deer. The
next tactic involved hunters using fire to trap the deer on a mountain and force them to an area where hunters with bows and arrows were waiting. This tactic was usually a communal effort between different tribes and bands (Garth 1953:132). Garth (1953:132) wrote that “the Atsugewi burned five or six mountains a year.” The final tactic was to construct a long tule fence with streamers hanging down from the top. The fences often stretched for half a mile. The fence line had gaps in it where the deer could pass through to escape and hunters waited close to the gaps to ambush the scared dear (Garth 1953:132).

Summer camps were often in close proximity to favorable hunting areas. Once a kill was made, the meat was dried on a long pole tied between trees. Later it was cooked and stored near the winter camps (Garth 1953:133). If a kill was made during the winter, the meat was smoked to preserve it. Deer meat was bundled together and often kept in baskets hung high in trees (1953:132).

Other mammals hunted in the area included black and grizzly bears. Black bears were killed whenever encountered or when hibernating. If hunters discovered a bear hibernating in a cave, two men crawled in, one carrying a bow and arrows and the other a torch. A large block of wood was put between the bear and the hunters; one of the hunters shot the bear and both men retreated. The bear would trip over the wood chunk when trying to defend itself. Often the bear died inside of the cave (Garth 1953:134). Hunters would track a grizzly bear to its cave and cover the entrance until a group of men could help to kill the bear. Before the hunt began, the group held a meeting where a shaman sang and foretold about the hunt (1953:134). The men yelled at the bear using kin terms, until the bear made his way out of his cave. One or two men held poles across the
entrance of the cave so when the grizzly tried to climb over the poles, the men pinned the bear against the roof of the cave where other hunters could have an easier shot at the subdued bear (Garth 1953:134). Hunters used extra-sharp and poisoned arrow points when attempting to kill grizzlies.

Other large game hunted included American bison, mountain lion, elk, and mountain sheep. It is unlikely that bison occupied the Eagle Lake Basin. However, there are historical accounts that numerous herds roamed in Big Valley (Garth 1953:134). Mountain lions were considered more dangerous than grizzly bears and were hunted using dogs.

Smaller mammals were also an important resource. Rabbits (cottontails and jackrabbits) were driven into large nets stretched out across the landscape. Rabbits became entangled in the nets and were easy prey for a hunter with a club. Skunks were said to be very fine eating if they were killed with smoke rather than violence (Garth 1953:134). Other small game such as wildcat, raccoon, coyote, skunks, and red fox were skinned and cooked in an earth oven. Earth ovens could be as much as 6 feet wide and were lined with rocks heated by a fire (Garth 1953:134). The animal was placed inside the oven, and then rocks were placed on top of the animal. The rocks on top of the animal were then covered with a layer of pine needles and hot ashes and left to cook for half a day (Garth 1953:134).

**Birds**

Important bird species in the Eagle Lake area include ducks, mud hens, geese, and swans. Hunters shot waterfowl while hiding in the tules with bows and arrows. Men and boys ran down young ducks before they gained the ability to fly (Garth 1953:134).
Pintail ducks were speared at night by the light of a torch. Duck eggs were collected in large quantities and could either be cooked in earth ovens or boiled to preserve them up to a week (Garth 1953:135). The different aboriginal groups in the Eagle Lake area also used different snaring and trapping methods for waterfowl. Grouse and small birds such as meadowlarks, robins, and blackbirds were hunted with blunt-tipped arrows (Garth 1953:135).

**Plants**

Plant resources were especially important to the native people of the Eagle Lake Basin. An informant of Garth’s (1953:137) shared that he knew of 140 different food plants that were once used. As in much of California, acorns formed a large part of the diet. In the Eagle Lake Basin, there are very few oak trees so other plant resources such as sunflowers and geophytes were more important in the native diet during the part of the year the natives resided there. However, the importance of acorns caused indigenous groups to make long trips into Atsuge and Yana country to gather them. Agile men and women would climb into oak trees or use long sticks to knock down the acorns. Once acorns were on the ground, groups collected them into baskets (Garth 1953:137). Acorns were usually dried in the shell and transported back to the winter village, where they were stored in large baskets in the cookhouses. Acorn shelling was a social event in which both sexes participated, and the young people held contests to see who could shell them the fastest (Garth 1953:138). The shells were cracked using the teeth or by a handstone and anvil rock. Often the task was split between people; one person would crack the shell and the other would take the shell off (Garth 1953:138). The acorns were pulverized in a hopper basket mortar into the consistency of flour. The acorn meal was then sifted and
leached with cold and hot water. The resulting acorn meal was used to make mush or acorn bread. Mush was made by combining acorn flour and water and cooking it in baskets heated by hot stones (Garth 1953:138). Acorn bread was made by mixing acorn meal, a little water, and a small quantity of earth (Garth 1953:138). The formed dough was cooked inside of an earth oven; once cooked, the bread would last up to a week without spoiling. Acorn bread was an important food when groups went out for longer hunting and gathering trips. Other important nuts were sugar pine nuts, digger pines nuts, and buckeye nuts (Garth 1953:138-139).

Other staple vegetable foods included epos and geophytes. Epos and geophytes are the underground storage organs of perennial wildflowers such as yampa, biscuitroot, balsamroot, mariposa, sego lilies, and camas (Curley-Foster 2006:34-41). They served as an important food resource for nearly every group of California Indians (Anderson 2005:291). According to Anderson (2005:295), “Root foods are high in carbohydrate content and were second in importance only to seeds in the California Indian diets. Some bulbs have higher protein content than acorns.” In some cases bulbs were important emergency foods when acorn crops failed or if they lacked oak trees in their territories (Anderson 2005:295). Garth (1953:138) identified substantial root crops near the project area, such as Murken Bench, Government Lake, and Dixie Valley. There is no direct mention of the area around Eagle Lake being an important root crop gathering place, but these other areas share similarities in elevation and environmental setting, and are all associated with rock ring sites. Geophytes were dug up using digging sticks made out of green mountain mahogany wood sharpened to a point and hardened with fire. The skin of geophytes was removed by placing them in a shallow basket with damp sand and
working them back and forth with the foot until the skin came off (Garth 1953:138). The bulbs were dried in the sun on large flat rocks and then stored for winter. Geophytes were also eaten fresh and made into soups and a kind of bread. Rock-lined earth ovens were used to cook geophytes; once removed from the earth ovens, they were mashed together and made into cakes that varied in size from biscuit size to a foot in diameter (Garth 1953:138). Often the cakes were dried and stored for the winter, when they were soaked in water before being eaten. According to Anderson (2005:293), “The indigenous people of California actively managed the populations of plants that bore edible corms and bulbs.” They managed the geophyte crops so they could harvest large quantities, insure the plants would come back the following year, and enhance the vitality and size of their populations. Management techniques employed by indigenous Californian groups included sparing individual plants, harvesting bulbs after seed-set, weeding and coppicing around favored root plants or favored harvesting areas, and burning areas to decrease plant competition and recycle nutrients back into the soil (Anderson 2005:294).

When gold miners and settlers came to California, they witnessed California Indians using digging sticks to harvest geophytes and carrying them around in large burden baskets. This caused them to refer to Native Californians as “digger Indians,” now considered a prejudiced and insensitive term. These survival and management techniques directly created much of the park-like California landscape these early emigrants witnessed (Anderson 2005:294.)

Berries and seeds were other significant plant resources and included manzanita berries, skunk berries, wild plums, chokecherries, serviceberries, elderberries, huckleberries, gooseberries, buckthorn berries, and juniper berries. Manzanita berries
were gathered between July and August and were pounded, sifted, and made into flour, which could be shaped into small cakes and stored for winter (Garth 1953:138). Chokecherries were gathered in baskets when ripe, mashed into a paste, and eaten without cooking. Juniper berries were eaten fresh or were dried and pounded into flour (Garth 1953:139).

Seeds were collected from at least five different varieties of sunflowers as well as mustard and wild barley. Sunflower seeds were gathered over two weeks in July with seed beaters and baskets (Garth 1953:139). Sunflowers were abundant on mountain slopes and in recently burned areas. The seeds were parched in flat seed trays. The skins were removed by abrasion against the sides of the baskets. They were then ground on a metate and were ready to be consumed. The flour produced from this process was formed into small cakes that were eaten without cooking (Garth 1953:139).

The information discussed in this chapter was included to show that the Eagle Lake Basin has an abundant and diverse ecosystem to provide support for the theoretical framework of this thesis. It is also important to provide this ethnographic information to gain insights on tool use and cultural behaviors, which are outside of the focus of thesis, to better understand the human occupation of the area. In conclusion, Eagle Lake was a seasonally rich abundant resource zone where many groups congregated to extract environmental resources and to exchange resources that their local territories did not provide.
Chapter 3

Literature Review

Rock rings are present throughout California, Oregon, Baja California, Nevada, and beyond. This section describes the rock ring features recorded and investigated across these regions and discusses the range of interpretations generated by archaeologists. Possible applications for this thesis are suggested by gaps in the literature. The chapter concludes with a review of spatial analysis approaches, and their relevance for finding patterns in the layout of sites, features, and concentrations. This chapter also includes a discussion on seasonal upland migration, showing the importance of this adaptive strategy to many Californian Indians, and placing the rock ring sites in the broader context of human use of the region.

Rock Ring Functions: Known and Interpreted

Rock ring features have been interpreted as plant resource storage and processing areas, habitation areas, and religious and ceremonial features. The kinds of functions are generally defined by the size of the feature. Ceremonial and religious ring features are often larger. The two ethnographically known examples of dance house rock ring features were over eight meters in diameter (Johnson 1992:392; Aschmann 1959:109; Ritter 1981:27; Chartkoff 1983:752). There is some size overlap between plant processing ring features and habitation rings. However, habitation rings are often larger and constructed with a higher degree of care. The differences between habitation and processing ring features lie in the size, location, and associated resources. Habitation rock ring features include artifacts such as grinding stones, projectile points, lithic material, charmstones, faunal remains, fire hearths, and middens. Plant processing rings were often located on
basalt outcrops to promote drying. Associated artifacts include edge-modified flakes (EMF), bifaces, and grinding and pounding implements.

In the Six Rivers National Forest, located in northwestern California, rock ring features have been identified ranging from 1.5 to 4.5 meters in diameter. The rocks are not contiguous and are spaced around a circle (Chartkoff 1983:752). The rock features do not contain ash lenses or fire hearths and occur close to prayer seat features. These rock rings are interpreted as being associated with ritual activities (Chartkoff 1983:752).

In the Buffalo Hills in northwestern Nevada, rock rings occur along riparian zones in traditional Northern Paiute territory. According to Kolvet (2010:3), “A single course rock ring is believed to be the base of a former brush structure.” Two test pits excavated inside the rock ring feature revealed fifteen manos, twelve unifacial scrapers, interior and pressure flakes, calcined bone, two Rose Spring projectile points, two utilized flakes, late stage bifaces, and red ochre. The interpretation of the site is that it was a late spring to early summer hunting and gathering camp dating 1110-565 B.P. (Kolvet 2010).

The Mono Lake region, also in the traditional territory of the Paiute, contained two distinctive types of rock rings, measuring 2 and 4 meters in diameter, respectively (Davis 1975:39). According to Davis (1975:39), “. . . talking with local Indians we learned that the big circles had been the bases of dwellings or shelters and that the small rings were ballast for stores of pine nut cones.”

Owens Valley, on Sherman Summit, is also traditional Paiute Indian territory. Eerkens et al. (2004) identified 23 rock rings, lithic scatters, and burned features. Nine rock ring features, eight burned features, and several lithic scatters were excavated (Eerkens et al. 2004:18). Eerkens et al. (2004:22) performed spatial analysis between
rock rings and lithic scatters, finding no significant statistical correlations between these two feature types. They also found no significant correlation between sizes and opening orientation of rock ring features. This led Eerkens et al. (2004:25) to interpret the rock ring features as the byproduct of caching and processing of pinyon green-cones.

Fosters-Curley (1999), working in the Pit River Uplands in Northeastern California, identified four different semi-circular rock features: hunting blinds, large rock features, house rings, and rock rings. Hunting blinds are often small with a wall two to six courses high. Some of the hunting blinds Fosters-Curley (1999:48) identified were semi-circular, while others were full circles. Hunting blinds in the Pit River Uplands were located in close proximity to game trails, canyons, and water sources. Fosters-Curley (1999:48) describes house rings as being the most ubiquitous features in the study area, with 19 present. These are identified by their location, large size, and generally shallow depth. They consist of one or several courses of local basalt arranged in a circular or oblong ring around a midden and/or hearth. By contrast, sixteen rock ring features were built on bedrock located on or near rims of outcrops (Fosters-Curley 1999:49). Rock rings are two to several courses high and are usually larger than house rings. They often incorporate larger boulders into the construction (Fosters-Curley 1999:49). According to Fosters-Curley (1999:137), “Storage camps and upland occupation sites are typically located in proximity to productive root areas and reliable water sources for geophytes processing. Inhabitants of these sites stored roots in talus pit and rock ring caches which represent one of the most distinctive hallmarks of intensive root exploitation.” She attributes these rock ring features to being a part of an adaptive shift around 1300 years
B.P. to a more permanent life way where intensification and storage of roots crops became vital (Fosters-Curley 1999).

Johnson (1973) started an analysis of the archaeology, ethnographies, and oral histories pertaining to many aspects of Native Californian culture in Northeastern California. It is unfortunate that it was never completed or published, because the synthesized information in this draft is invaluable. Johnson (1973) identified many rock ring features throughout Northeastern Californian. In the Southern Cascade Mountains, Johnson (1973) notes throughout his investigation that often both rock rings and house pits are present at sites and represent what were apparently single-family residences. One rock ring site investigated was located along Wildcat Creek 0.6 kilometers upstream from its junction with Little Wildcat Creek, east of Los Molinas. No site number was identified in the report. The site consists of 23 well-defined stone rings with wall heights of 60 cm to 70 cm or more (Johnson 1973:375). All rings had large assemblies of lithic materials, milling slabs, and handstone. However, because there was no midden evident in the site, Johnson (1973:376) suggested that these sites functioned as seasonal camps and were only used for a relatively short period annually.

Of the 69 rock rings investigated in the Middle Pit River Region by Johnson (1973:392), most were uniform in size with one exception. The majority ranged from 3.5 to 5.2 meters in diameter (Johnson 1973:392). The outlier rock ring identified measured 9.1 meters in diameter, and was located at site Mod-265. It functioned as a dance ring. This conclusion came from an interview with a local man named Mr. Lorenzen. He was born in the late nineteenth century and raised in Little Hot Springs Valley (Johnson 1973:392). As a child, Lorenzen was told about the site by Achomawi families living in
the valley, who identified the large rock ring as a dance circle (Johnson 1973:392.) According to Johnson (1973:392), “Mod -345 was last used in 1857 by a group of Achumawi who attempted to hide from Lieutenant Crook and 33 soldiers.” Many of the rock rings in this area lack midden but have associated artifacts indicative of a habitation area.

Johnson (1973) concludes that rock rings were built in areas that lacked the soil necessary for the holes to support the posts of a conical structure. They were most likely single-family dwellings that functioned as seasonal habitation areas during upland migration for resource procurement. Johnson (1973) never states it directly, but it becomes clear from his descriptions that house pits and rock rings are similar in design and co-occur at many sites, differing in construction material and the surface they are constructed on. This aspect is very interesting because rock rings are often more visible than house pits. When a project focuses on rock rings, house pit features serving similar functions might not be identified and investigated.

Rock ring features also have been found in South-Central Baja California. Ritter (1981) identified three types of ring features: the single-family dwelling, a large circular rock ring, and a small rock ring. The single-family rock ring dwelling features are circular or oval and have a mean diameter of 2.7 m. According to Ritter (1981:27), “The walls are formed of cobbles and boulders which apparently served as the foundation or anchor for a brush superstructure.” These rings occur individually or in groups of two or three. The large circular rock ring feature is 8.5 meters in diameters and is believed to represent a ceremonial structure based on ethnographic accounts obtained by Aschmann (1959:109). This describes a similar large round brush hut constructed for shamans and
used for a deerskin festival. The large circular rock ring was associated with the smaller family dwellings, a pattern also seen by Cook and Heizer among other Alta California groups (Ritter 1981:27). The small rock rings defined by Ritter (1981:38) has a diameter between 75 cm to 1 meter and a height of 15-20 centimeters. These features represent fire or cooking rings, or the foundations for storage structures (Ritter 1981:38).

The site of Los Corralitos is located in Sierra San Alberto, Central Baja California, Mexico. It consisted of 45 walled circular stone enclosures, referred to as corrals, associated with milling equipment, shell, bone, and chipped stone from an array of raw materials (Hyland 1997:176-177). Three charcoal samples from Corral 16 under the lowest course of the stone enclosure yielded dates ranging between 380±50 B.P. and 450±60 B.P. (Hyland 1997:176-180). Raw material included obsidian, quartz, basalt, rhyolite, and chert. Bone and shell fragments were more commonly from small mammals than large mammals and fish remains (Hyland 1997:176-182). Twenty metates and nine manos were found on the surface and one metate was found stored into one of the corral walls. Eighty-four projectile points were also found; point types included Comondu triangular and Comondu serrated, eight Elko series, four lanceolate, and one La Paz-gypsum. The projectile point types demonstrate that this area had been used over a long period. Hyland’s (1997) interpretation of the site was that the corrals functioned as stone foundations of habitation structures. According to Hyland (1997:185), “Los Corralitos site, appears to have been a strategically located at one of the few sources of water found between the Sierra and Gulf Coast.”

This section of the literature review examined interpretations, conclusions, and known functions that have created the foundation for the investigation of rock rings along
the western shore of Eagle Lake. Some of the themes represented in this review include that the artifacts associated with rock rings suggest they served a variety of functions, including habitation, storage for geophytes and other plant resources, and religious/ceremonial activities. The works of Johnson (1973) and Fosters-Curly (1999) are especially relevant because their investigations took place within close proximity to Eagle Lake and share many environmental aspects. Fosters-Curly’s (1999) interpretation that rock rings are evidence of an economic shift to intensified dietary importance of geophytes is very interesting because there is an array of wild flowers and geophytes present in early spring to late summer between Eagle Lake’s shore and the ecotones of mixed pines and junipers. According to this interpretation, the abundance of geophytes along this area could be a factor in explaining the concentration and amount of rock rings along the western shore of Eagle Lake.

The temporally diagnostic artifacts found at the array of sites discussed in this chapter create expectations as to what temporal range the site along Eagle Lake should follow. Kolvet (2010) dates the northwestern Nevada rock ring site to 1110-565 B.P. and found two Rose Spring projectile points. Fosters-Curly (1999) dates the shift to a more permanent settlement system in the Pit River Uplands area, when people began to use rock rings, to around 1300 B.P. Johnson (1973) never gives a date of concentrated use for the rock rings, but does document that they were used until 1857. Hyland (1997) provided three absolute dates that range from 380±50 B.P. to 450±60 B.P. from rock rings in Baja California. However, Hyland (1997) also found diagnostic artifacts that are indicative of a much older time.
Most of these dates fall into the Late Archaic (cal B.P. 1300-600) and Terminal Prehistoric periods (cal B.P. 600-Contact) (McGuire 2007). Diagnostic artifacts from the Late Archaic include Rose Spring and Gunther barbed arrow points, which signal the advent of bow and arrow technology (McGuire 2007:174). Diagnostic projectile points of the Terminal Prehistoric include Desert side-notch and Cottonwood types. Archaeological evidence in the region shows that Rose Spring and Gunther barbed arrow seem to spill over into points of the Terminal Prehistoric Periods (McGuire 2007:175).

The relevance of these temporal and cultural periods will be investigated further in Chapter 3.

Theoretical Framework

Boundaries and transitions between ecosystems often have rich, productive biodiversity that is easily accessible for human exploitation (Turner et al. 2003:440). A basic example would be the placement of a camp or village on the shoreline of an ocean or river. Residents of these encampments have the ability to draw from both aquatic and terrestrial habitats. According to Turner et al. (2003:442),

> Human societies situated “on the edge” ecologically and geographically, in terms of their access to resources of two or more ecosystems, are likely to benefit from this increased diversity by being more flexible and resilient than those people situated within more homogeneous environments.

Human populations have managed and created ecologic edges using fire, landform enhancement, tree clearing, etc. (Turner et al. 2003:442). The Coast Salish peoples of southern Vancouver Island cleared rocks and brush from camas root beds, opening up stretches of parkland interspersed with Garry oak trees. Turner et al. (2003:451) states,
Aboriginal peoples intentionally change the temporal and spatial characteristics of ecological cycles in order to create physical edges and thereby increase the abundance of resources of a patch and change the spatial distribution of resource patches to more favorable harvesting locations.

These rich ecological edges attract different groups and can become central locations for cultural interfaces or cultural edges (Turner et al. 2003:452). When groups meet at such locations, goods and resources are not the only things exchanged. Intangibles such as concepts, skills, technologies, narratives, names, dances and songs, religious ideas, and linguistic traits can all be exchanged as well (Turner et al. 2003:452). For these types of relationships to form, encounters must be continuous and habitual, such as when neighboring groups routinely visit and associate at shared resource harvest areas or during cultural events. These relationship can create institutionalized exchanges that provide people access to resources they would not regularly be able to obtain (Turner et al. 2003:454).

In summary, ecological edges attract many groups because of abundant and diverse ecosystem. These areas create forums where people can learn, trade, and share tangible and intangible resources. For humans, ecological edges and cultural edges are linked together: they help groups of people to adapt, and to become more flexible and resilient to adversity. Flexibility and resilience provide the means for people to better adjust to times of unexpected and unpredictable changes. Societies can draw from the more rich and diverse ecosystem and use the experiences and knowledge they had learned in ecological and cultural edges (Turner et al. 2003:457).
**Seasonal Upland Migration**

Based on the ethnographic and archaeological evidence, archaeologists have theorized that several groups of local Native Californians, including the Pit River Tribes, Mountain Maidu, and the Northern Paiute, all traveled upland to Eagle Lake seasonally for hunting and gathering activities. This section outlines this process of seasonal upland migration and discusses some of the reasons that people shifted to this settlement pattern.

In the winter, higher elevations such as Eagle Lake at over 5100 feet above sea level (ASL) would have been extremely cold and windy, and would have provided miserable living conditions. Winter conditions of the Eagle Lake area have substantiated that upland migration theory. It is conceivable that groups could survive under these environmental conditions, but currently no archaeological evidence for winter semi-subterranean lodges has been located. Even in modern times with the advent of modern luxuries, very few people live in the area year-round.

Beginning around 1500 B.P. in the Pit River Uplands area, there was a dramatic shift to a two-village settlement pattern that corresponds to an increase in aridity (Foster-Curly 2006:12). Winter villages were located at relatively low elevation such as Honey Lake, California at 3990 feet ASA. According to Lightfoot (2009:279) “... winter villages were organized into discrete house clusters, where related families established homes, cookhouses, storage facilities, and sweat houses.” At larger settlements, wealthier family lived in semi-subterranean lodges, while less wealthy families spent the winter in tule mat lodges and or dome-shaped huts. Religion played an important role in winter life, with people active in ceremonies, dances, and feasts (Lightfoot 2009:281). One of the most notable events was the Big Time, when people from nearby villages were
invited for several days to enjoy feasts, gambling, trading, and competitive sweat dances, and likely share information and created family and tribal alliances (Lightfoot 2009:281).

During early to late spring, the village broke into nuclear families and began a migration into the higher elevations. According to Eerkens (1999:303), “Spring time settlements would typically focus on warmer low elevations, where plants would bloom and ripen first.” However, in the Sierra Cascade Mountains, snow pack needed to melt before groups were able to travel to the higher elevations. Once the small family groups reached the uplands, they set up temporary hunting and gathering camps. Women gathered plant resources as they became available through early spring to late summer (McGuire 2007:168). According to McGuire, “A number of root crops, particularly epos and camas, were of critical importance . . .” (2007:168). Most geophytes are rich in calories, are easily gathered and processed, and are highly storable for the lean winter months. The important geophytes in the area were yampa, biscuitroot, and balsamroot; processing was different for each (Curley-Foster 1999:34-41). Other plant resources included salmon berries, bearberries, juniper berries, wild plums, wild buckwheat, choke cherries, and wild onions. Acorns were also important to the Pit River and Mountain Maidu. However, oaks do not occur in the Eagle Lake vicinity, so foraging parties made long journeys to obtain such resources for winter storage (Garth 1953:138). The nuts from sugar pine and gray pine were also a staple food.

Hunting and fishing were other important activities in the uplands. Fishermen employed a range of methods, including traps, nets, and harpoons, to catch salmon, trout, and Sacramento suckers (DeGeorgey 2006:22; Lightfoot 2009:281; Foster 2006). Fishing was an important subsistence pursuit at Eagle Lake and in the surrounding area.
According to Garth (1953:136), “. . . along Pine Creek, which empties into Eagle Lake, a man could catch fish with his hands and throw them out on the bank. Enough fish might be obtained to keep the group in meat for a month or more (from 2 to 10 baskets of fish per man.)” Surplus fish were dried and stored for the upcoming winter. People in the uplands also hunted for deer, antelope, bear, small mammals, waterfowl, and the occasionally elk that wandered into the area.

Hunting and gathering were not the only reasons people traveled to higher elevations; social aspects were also important. Sharing of information, particularly about the environment, was a necessity because groups needed to be in specific areas when resources became available and they needed to spread evenly across the landscape to maximize resource gains (Mandryk 1993:47). According to Mandryk (1993:48), “Information generally flows along social networks, with ritual gathering playing an important role in bringing people together for information exchange, mate selection, and other interaction.” Social networks formed by alliances between different groups and tribes are normally developed through trade, marriage, and spouse exchange (Mandryk 1993:47). This is important to the Eagle Lake archaeology because it adds support to the idea that the area was a cultural edge where people shared tangible and intangible resources.

Prior to fall, many plant and animal resources were collected and prepared for winter storage. According to Lightfoot (2009:282), “Food was cached for a later pick up, carried to elderly relatives left at home, or transported back to the primary residence . . . ” Once groups congregated together at the winter village, preparation for winter began,
which included maintenance and construction of habitation areas and weatherproofing their storage of food (Eerkens 1999:303).

The Northern Paiute ethnographic boundaries are approximately 20 miles from Eagle Lake; the Northern Paiute also were likely seasonal residents of this area. The Northern Paiute practiced a dispersed subsistence-settlement pattern in which single-family groups formed semi-nomadic economic units similar to the Great Basin Family Band Foragers (Steward 1938; McGuire 2007:169). They hunted and gathered throughout their home territory and often in neighboring territories. According McGuire (2007:160), “Settlement and subsistence patterns were closely tuned to fluctuation in seasonal availability and distribution of wild food resources.” Like the Pit River and Mountain Maidu seasonal upland migration settlement strategies, the Northern Paiute had semi-permanent winter villages. Winter villages were often located in areas where resources were abundant but could be moved frequently during lean years (Kelly 1932).

At its basic description, the Northern Paiute settlement system is only slightly different from that of the Pit River and Mountain Maidu in that they were more nomadic.

Seasonal upland migration and ecological and cultural edge theory are linked. Seasonal upland migration is a strategy designed to obtain resources from a productive region with a later harvest time than the winter village. Ecological edges such as Eagle Lake likely attracted many groups to the area. With many groups coming to the area seasonally, a forum or a cultural edge was formed where groups could exchange tangible and intangible objects. The information and knowledge shared between the distinct groups often helped perpetuate the stability of each and helped them to better adjust to times of unexpected and unpredictable changes. Societies could draw from the more rich
and diverse ecosystem and use the experiences and knowledge they learned from others (Turner et al. 2003:457).
Chapter 4

Overview of Previous Research, Regionally and Locally

The previous chapter described previous investigations of rock ring sites over a vast region and helped create a functional overview and temporal contexts for rock rings on a large scale. This chapter explores the local and regional context of human occupation and resource exploitation into which they fit, as well as the rich historical sequence that has been defined for this region from the early Holocene to the historic era. This chapter begins with an environmental setting description and follows with a description of both previous archaeological research on Eagle Lake rock ring sites and the additional site research conducted for this thesis.

Chronological Overview of Human Occupation

The temporal sequences compiled for this thesis derive from Pippen et al. (1979), Delacorte (1997), and McGuire (2002). Pippen et al. (1979) provide a site-specific temporal sequence that is virtually a mile away from the study area of this thesis; all sites are located in similar environmental settings. McGuire (2002) and Delacorte (1997a) both look at a broader temporal sequence by synthesizing different studies across Northeastern California to create a standardized chronology.
Figure 4.1. Comparative Chronological Schemes for the Modoc Plateau and Eagle Lake Basin (DeGeorgey 2006:14).

Lonnie Pippen excavated Pike’s Point (CA-LAS-537) in 1979 to mitigate adverse effects of the construction of a marina. This led Pippen et al. (1979) to create a chronological sequence for the Eagle Lake Basin using both geoarchaeological and archaeological data. The Eagle Lake Basin chronology starts with the earliest period, the *Eagle Lake Phase*, dating before 4500 B.P. During this period, the Pike’s Point site was underwater but evidence of lithic material suggests that indigenous groups were using the area. Diagnostic projectile points include Northern side-notch and Parman types. The *Aspen Grove Phase* (4500 to 2000 B.P.) begins with a decrease in the water level of Eagle Lake. Diagnostic projectile points include Sierra stemmed triangular and Martis contracting-stem types, multifunctional bifaces, cobble manos, and slab and block millingstones. In addition, there is evidence from bifaces that burin technology was part of their tool set. During this period, the primary tool stone was basalt, while obsidian was

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used mostly for projectile points. Diagnostic artifacts of the *Pike’s Point Phase* (2000-1000 B.P.) include the introduction of Rose Spring and Gunther barbed types. Artifacts also include shaped manos and bifacial millingstones. According to Pippen et al. (1979:146),

> The Pike’s Point Phase probably includes a series of short-term occupations by peoples not necessarily of the same genetic or linguistic background. Their tool kits were highly similar since they were probably utilizing similar resources, but variability in projectile point style could reflect varying cultural relationships.

In the final phase, the *Later Occupation* (1000 B.P. to the historic era), diagnostic artifacts include Cottonwood leaf-shaped points. An interesting aspect of Pike’s Point during this later phase is an absence of Desert side-notched projectile points, which are very common during the late prehistoric and historic periods in the larger region. The lack of Desert Side-notched points led Pippen et al. (1979:144) to suggest that the site was abandoned during the last 500 years.

The earliest phase of regional occupation that McGuire (2002) defines is the Early Holocene or the Paleo-Indian occupation, which dates to before 6500 B.P. Diagnostic artifacts from this period include Clovis-like projectile points. Such diagnostic projectile points have been found at Eagle Lake and Hat Creek (Dillon 2002:113). None of these tools have been dated directly, but it is assumed that their dates are similar to Clovis points found across North America, at cal. 13500 to 11500 B.P. (McGuire 2002:169). There are also several Paleo-Indian sites along the margins of Honey Lake, which have been identified from large hydration rim values (McGuire 2002:169). Most Paleo-Indian assemblages do not occur with millingstone equipment. This has led archaeologists to
infer that these people were highly mobile and traveled in small groups who anchored themselves to lakes and rivers (McGuire 2002:170).

During the later part of the Early Holocene (<11500 cal B.P.) the diagnostic artifact assemblage changes to large lanceolate and stemmed projectile points in association with heavy core tools and chipped stone crescents (McGuire 2002:170). Some later Early Holocene sites in close proximity to the current project area include Eagle, Bucks, and Honey Lakes. The Honey Lake sites are particularly interesting because they have a high degree of assemblage diversity that includes both flaked tools and groundstone. The faunal assemblage suggests these people were hunting and gathering small game, such as rabbits, fish, and shellfish. This is contrary to the more generalized pattern seen elsewhere, in which Paleo-Indians hunted and followed large game.

The next period is the Post-Mazama period, dating from 7000 to 5000 cal B.P. Diagnostic artifacts and features include large side-notch projectile points (northern side-notched points), antler wedges, mortars, V-shaped bowls, T-shaped drills, tanged blades, flaked stone pendants, and large subterranean house structures. Northern side-notch points generally appear to postdate the 7000 cal B.P. Mount Mazama ashfall and terminate around the end of this period (McGuire 2002:170). The distribution of the northern side-notch point seems to originate in the Columbia Plateau and fan out across the northern section of the Great Basin. This suggests that the people of the Columbia Plateau had an influence on Northeastern California and the upper reaches of the Great Basin. South of the Madeline Plains, northern side-notched projectile points are very rare, and none have been identified in the Eagle Lake Basin. Points that do occur in this period
and next include Gatecliff, Fish Slough, large contracting stemmed, and other Martis-like variants (McGuire 2002:171).

During the Post Mazama period, adaptive strategies began to change with an emerging focus on upland foraging. These people were still highly mobile and had no systematic dependence on storage. Plant resources, however, do become increasingly important. According to McGuire (2002:171), “. . . there is a three-fold increase in the frequency of milling equipment corresponding to the latter period that has been attributed to the rising importance of plant resource exploitation.” Archaeologists such as Kowta (1988) have suggested the existence of a Millingstone Horizon similar to the one seen in southern California and dating to roughly the same period.

The Early Archaic period dates to 5000-3500 B.P. This period is highly visible in the archaeological record compared to the previous two periods. During the Early Archaic, a high degree of regional and temporal variation emerges in Northeastern California, just as it does elsewhere in North America. Diagnostic projectile points from this period include Gatecliff and Humboldt concave base. On the Modoc Plateau, Elko and Siskiyou side-notched forms replace the Gatecliff split stem points. In the southern section of Northeastern California, the Gatecliff series is still present but now Elko points and other large Martis-like dart points are used. The Martis complex or Martis tradition appears primarily along the Sierra Nevadas and north of Lake Tahoe. The Martis complex is characterized by the use of basalt in the manufacture of large bifacial tools (McGuire 2002:172). In the Sierra Valley, several large rock-lined processing features have been identified as roasting ovens. They appear to be associated with a Martis occupation in the area.
The Middle Archaic period dates to 3500-1300 cal B.P. This period provides the first evidence of extensive habitation and a semi-sedentary lifestyle. Evidence includes house structures with associated midden deposits, hearths, ovens, and burials, and a very diverse assemblage of artifacts and subsistence remains (McGuire 2002:173). Similar sites have been identified across adjacent deserts, as well as Middle Pit River, Feather River, Lassen Volcanic National Park, and Eagle Lake. Most of these large elaborate villages and base camps that have been documented to this period (McGuire 2002:173). Two projectile points characteristic of this period are the Martis and Elko projectile point types. These two projectile points types have similar morphological traits, which has led archaeologist to theorize they are just regional differences of the same projectile point style (McGuire 2002:173). During this period, obsidian source diversity shrinks and the focus shifts to more regularized acquisition of a few key materials gathered during logistical travels between habitation areas. This switch to obsidian procurement has created very distinct uniform obsidian source profiles (McGuire 2002:173). There is also evidence of trade to the west with an increase of marine-shell into the Great Basin during the Middle Archaic.

The Late Archaic period dates to 1300-600 cal. B.P. Some major changes occurred between the Middle Archaic and the Late Archaic, most likely due to the medieval climatic anomaly (MCA). The medieval climatic anomaly occurred between 1100-600 B.P., and is defined as an increase in aridity and hotter conditions (McGuire 2002:173). The effects of the MCA on Northeastern California Indian populations are not yet completely understood. Across California, cal. 1000 B.P. marks a time of instability and upheaval. However, other factors such as increased population density and
environmental degradation all attributed to the instability and decline during this period (McGuire 2002:173).

The Late Archaic period had some major shifts in the tool kit used by Northeastern California Indians. The introduction of bow and arrow technology ushered in new diagnostic artifacts such as the Rose Spring and Gunther barbed arrow points. Brownware ceramics also occur in the northern section of Northeastern California (McGuire 2002:174). Tool stone production shifts from targeting a few key quarry zones to an increased reliance on trade network exchange, scavenging older tools and refuse, and obsidian pebble and cobble material (McGuire 2002:174). This creates a diverse obsidian profile for the period, again reversing the earlier trend. House structures predating 1000 B.P. are clustered rather than isolated, and are more formally built with elaborate superstructures, central hearths, caches, storage pits, and perimeter rock. House structures postdating cal 1000 B.P. lack similar complexity to their counterparts in the earlier period. They occur as ephemeral domestic features, rock rings, or living surfaces (McGuire 2002:174). This period has some of the largest villages documented in the Western Great Basin during the late Holocene (McGuire 2002:174). These villages appear to have been used for only brief durations. These large Late Archaic villages may have developed in response to threats of warfare, raiding, and other forms of social conflict that are believed to have occurred during this period (McGuire 2002:174).

Resource intensification expanded during the Late Archaic period. Faunal remains from many sites in the area show a drastic decline in the use of large game species. In much of the region, camas root became a staple survival food. Upland migration became an important strategy during this period and likely developed to exploit the seasonal root,
seed, and berry crops in the uplands. According to McGuire (2002:174), “Although some of these root crops may have been exploited to a limited extent in earlier times, their intensive use and storage in the late period reflects a fundamental shift in land-use patterns that may have developed in response to wide-spread population and resource imbalance.” Other intensified resources in the Middle Pit River Region include freshwater mussels, seeds, and manzanita berries.

The Terminal Prehistoric period dates from cal 600 B.P. to the point of European contact, which for this region is first documented around 1848 (Budy 1982). The diagnostic points from this period include the Desert side-notched and Cottonwood types. Both Gunther barbed and Rose Spring continue from the Late Archaic into parts of the Terminal Prehistoric. By this time, large seasonal or semi-permanent Late Archaic settlements were abandoned and replaced by smaller settlements made up of a few independent households (McGuire 2002). Resource procurement shrunk from logistical hunting and gathering party forays to daily trips near the encampment. Faunal remains from this period show a rebound in the use of large game species.

In Northeastern California, populations changed due to the arrival of the desert-oriented Numic-speaking groups (Northern Paiute) from Southeastern California and Nevada around 500 years ago. The inclusion of the Numic groups into Northeastern California is believed to have caused conflicts and changes in settlement patterns throughout the region (McGuire 2002:175). Numic groups traveled across the landscape in small family units procuring seasonal resources. Sites dating from this period seem to be more ephemeral; associated artifacts and features include isolated groundstone, hearths, limited debris scatters, and small pockets of stained soil. In the Middle Pit River
area, the settlement system actually differed significantly from the Numic way of life (McGuire 2002:175). Habitation areas were anchored to major river margins and adjacent uplands. House features include both single- and multi-family residential camps that contain a variety of stone and bone tools, roasting features, hearths, work areas, and storage pits, reflecting all aspects of residential activities, including plant and animal processing and tool maintenance and production (McGuire 2002:175). Conflict, warfare, and raiding occurred during this period and could explain why groups lived in the rugged canyons and rimrock country of the Modoc and the Pit River uplands (McGuire 2002:176).

Judging from the previous chronological overview, rock rings seem to appear during the latter part of the Middle Archaic period and remain in use until the Terminal period and Contact. McGuire’s (2002) discussion of rock rings and seasonal upland migration focuses on the Late Archaic. However, projectile points found at CA-LAS-345/fish trap site suggest that the sites could possibly date into the Early Archaic period. During the Middle Archaic period, the MCA likely shrunk Eagle Lake drastically, causing many groups to find other areas to exploit. Because information on the effects of the MCA on the Eagle Lake Basin is limited, future research would be important to identify the extent of environmental degradation.

Previous Ethnographic Review

The ethnographic record is a vast library of insightful and pertinent data. It is an invaluable resource to archaeologists because it allows them to intertwine recorded activities with artifacts, features, and spatial attributes. The ethnographic record does have its limitations, but the information that can be extracted illuminates prehistoric
activities, functions, and tool uses, information that archaeology alone cannot usually provide. When archaeological research and ethnographies are used together in making interpretations, a more comprehensive picture of prehistory emerges. For this investigation, the ethnographic record of the Atsugewi, Achumawi, and Paiute were analyzed because their traditional territories are located within the Eagle Lake Basin. All three groups followed transhumant seasonal hunting and gathering rounds. Eagle Lake was likely part of their upland migrations to extract and store resources for harsh winter months.

The Acomawi, Atsugewi, and Aporige are three bands of the Pit River Tribe. The Pit River Tribe is made up of 11 bands and their traditional territories followed the Pit River drainage basin into the Eagle Lake region (Budy 1984:4). All three previously mentioned bands had similar seasonal rounds and habitation structures. People grouped together in lower elevation winter villages and survived on stored plants and animals collected during the previous summer. According to Lightfoot (2009:279), “The primary social unit, the winter villages were organized into discrete house clusters, where related families established homes, cookhouses, storage facilities, and sweat houses.” During the freezing winter months, they lived in large semi-subterranean lodges. These lodges were oval-shaped and measurements ranged from 10-25 feet long and 8-20 feet wide with varying depths (Garth 1953:143; Dixon 1908:210). Winter Atsugewi villages were comprised of 20 to 25 house structures. The villages were often divided into several discrete family house clusters, which could be as much as a quarter of a mile apart from each other (Garth 1953:176).
The largest lodge seen by Garth (1953) on his expedition was 34 feet in length and was constructed for the Ghost Dance revival in 1892 (Garth 1953:143). Chiefs and rich men usually had large lodges, used communally as meeting areas and sweathouses. These lodges were constructed of wooden beams and poles and covered with grasses and earth. There were two entrances, one in the roof and one low on the lodge wall. The roof entrance was located next to one of the center poles (where individuals entered down a ladder) and functioned as a ventilation system for smoke (Garth 1953:143; Dixon 1908:210-211; Golomshtok 1922:7). The lower entrance faced west and was a ventilator door. One informant suggested that its orientation enabled people to see the rising sun from inside the lodge (Garth 1953:144). A different informant stated that the door faced either east or south, opposite the direction the local winds blew (Garth 1953:144; Golomshtok 1922:7). Unfortunately, there is no reference to rocks being used in the construction of these semi-subterranean lodges.

In the winter villages, people also lived in smaller structures. Less wealthy families and elderly people lived in dwellings with circular or rectangular floor plans (Garth 1953:144). Conical huts were constructed with a wooden superstructure built over a shallow pit, with bark or tules for insulation (Golomshtok 1922:9). These smaller domed structures had a multitude of functions. They were the primary habitation structures for smaller, less wealthy families and the elderly. In addition, elderly people used these structures when they could not physically climb into the larger lodges. The conical huts also functioned as specialized food preparation areas, storage, and menstruation huts (Lightfoot 2009:280).
When the weather started to warm and the snow was melting, people headed to the uplands in hunting and gathering family groups. Garth (1953:144) reported that "summer camps were little more than circular enclosures of brush, juniper limbs or other conifer limbs, or of rocks." They measured 10 to 15 feet in diameter with the opening to the east. The structures had no roofs. During inclement weather, branches and bark slabs were placed over the makeshift frame (see Figure 4.3). These structures were clustered around the chief dwelling to provide an extra windbreak (Garth 1953:143).

Kniffen (1928:317) identified a site between Coyote and Dixon valleys, located to the north of Eagle Lake. Informants told him this was a summer retreat used when they were fighting with the Modoc tribes. The site included a 200-foot defensible wall and a dozen stonewall houses (Kniffen 1928:317). A picture of this area was taken and the description states,

One of the stone house walls within the fortification erected by the Aporige against the Modoc raids on the canyon wall between Coyote and Dixie Valleys about six miles east of Dixie. These were brush covered and used only in summer. (Kniffen 1928:317)

Garth (1979:238) also describes similar fortifications built to protect against the raiding Paiute and Modoc-Klamath slave raiders as early as 1725. According to Garth (1979:238),

To protect themselves the Apwaruge built at least two stone forts. One had a bluff on one side, with a number of interconnected roundish enclosures 8 to 10 ft. across, behind which families could hide while the men fought off the enemy.

Rock rings along the west shore of Eagle Lake were most likely only visited during the spring and summer months due the elevation of 5200 feet. The Eagle Lake area is known for its harsh winters and heavy snow pack. Small groups traveled to the
upland areas to obtain available plant and animal resources that they could process and store for winter. Eagle Lake would have been a favored location due to its rich and diverse edge ecosystem (Turner 2003:440.) Plant, mammal, fish, and bird resources could all be extracted in this region without much traveling.

Figure 4.2. Achomawi Summer Habitation Structure. Photo by Edward S. Curtis.

The Northern Paiute lived a more nomadic way of life compared to the other tribes in the study area. They built three types of known structures: earth-covered mountain houses, conical mat-cover houses, and windbreaks. The mountain house was semi-subterranean. It was built with a willow superstructure covered in large pine branches and dirt. The description is similar to the Achomawi and Atsugewi winter lodges. The main difference is the material they used for construction. Paiute winter villages were usually abandoned during the summer months (Kelly 1932:104-105). All
material was torn down and packed with them if they were traveling a relatively short distance. If the group planned to travel long distances, they would either cache the materials or abandon the structure. It was taboo to use an abandoned structure once it had been deserted (Kelly 1932:104-105). There is no mention of rocks being used as a construction material in the mountain houses.

Conical mat-covered houses were about 10 feet high and approximately 9-12 feet in diameter (Kelly 1932:104). Each was constructed of willow poles and sewn matting made from grass or tules. The entrance of the mat house faced the east, away from prevailing winds and toward the rising sun (Kelly 1932:105). A fireplace was located in the center of the structure. Most activities took place inside the structure except cooking. These structures were used in the winter and could last five years or longer. In historic times, houses were built in the same manner. The only difference was that they incorporated canvas and packing box material (Kelly 1932:105).

There were two types of Paiute summer structures. The first was a porch-type structure where people were able to get out of the relentless sun. The other type was about chest high and similar to the Achomawi, Atsugewi, and Aporige circular enclosures. A fire hearth was located in the middle and a tule mat covered the door (Kelly 1932:106) According to Kelly (1932:106), “Several informants insisted that in the earliest times they had no shelter other than the shade and the enclosure. . . . When it was snowing they just kept traveling, some froze to death because they had no rabbit blankets.”

After reviewing twenty ethnographic accounts, themes emerged from the data. These early ethnographers used earlier ethnographic accounts and then reapplied them in
their own studies. Furthermore, both original works and reapplication focused on winter villages but paid little attention to summer camps. There was virtually no new information about summer habitation structures. This became apparent in the descriptions of the Pit River Tribes’ winter and summer villages. The descriptions of the winter villages were detailed and went to great lengths to capture even subtle nuances of the villages, while the descriptions of the summer camps lacked detail and were more of a brief mention. This aspect is very confusing because rock ring features are visually significant. This suggests that descriptions of summer camps and habitation structures were derived from personal communication with Native Californians and not described from ethnographers’ visual accounts.

The next theme was that the habitation structures throughout the three distinct tribes were very similar. The only variance in design was the material used in construction, which is most likely attributed to the different regional environments. This, however, does not explain why the tribes had similar designs. One possible reason for similarity could be associated with kinship connections. According to Budy (1984:7), “The Aporige established kinship connection through intermarriage with Itsatawi, Achomawi, Madesi, Northern Yana, Mountain Maidu, and other groups.” These exchanges most likely transmitted cultural knowledge and adaptive strategies. All of the tribes in the project area lived in a transhumance seasonal round. They were in direct contact with other groups when they traveled to the rich uplands for hunting and gathering. During the summer months, goods and knowledge were exchanged between all groups in the area. The similar habitation designs were most likely a combination of
shared knowledge and developed as part of kinship ties through intermarriage between local indigenous groups.

Although the ethnographic record is a useful source of information about rock rings, it provides no detailed information about their exact functions. The information did point to some possible functions. The first possible function of the rock rings is that they could be the remnants of a summer circular enclosure. Evidence for this comes from Garth’s ethnographic accounts and DeGeorgey’s excavation of a single rock ring feature at CA-LAS-345. The other possibility for their function came from Kniffen’s (1928:317) and Garth’s (1979:238) ethnographic accounts, that one site was associated with a defensible retreat when the Aporige knew raids from the Modoc tribes were coming. Two brief mentions in ethnographic accounts and one excavated ring feature do not provide enough information to attribute a specific function to these features, but these data do provide a foundation for a more comprehensive study of rock ring features.

**Previous Archaeological Research on Rock Ring Sites in the Eagle Lake Vicinity**

Fortunately, two rock ring sites have been investigated four times in the Eagle Lake Basin, starting in 1977, by very knowledgeable archaeologists. Lonnie Pippen led the most notable investigation in 1979. Not only did Pippen et al. (1979) excavate a rock ring, they also produced a local chronological sequence based on projectile point types, fluctuation of lake levels, and absolute dating. Previous excavations on rock rings sites in the Eagle Lake Basin all produced evidence for seasonal habitation (Pippen et al. 1979; Friedman 1977; DeGeorgey 2006). The excavated material also pointed to the fact that rock rings in the area functioned as habitation structures like those described by Garth (1953). The projectile point types found at both sites are similar and are diagnostically
dateable, helping fit the sites into the chronological sequence. Data from the previously excavated sites were compared to the data collected for the current study to see if the sites were similar or had different assemblages and functions.

Forest Service site FS-05-06-25, also called Pike’s Point, was investigated in 1977 by Janet Friedman. One of the goals of the project was to evaluate the nature of the possible house depressions and rock ring features to determine if they were the remains of Indian habitation areas. One rock ring was excavated to 50 cm, where cultural material ceased. The cultural material recovered was minimal: from the 0-10 cm depth, they recovered one projectile point, four waste flakes, and several bone fragments; from 10-20 cm depth, 1 projectile point and 15 waste flakes were found. According to Friedman (1977:38), “Flotation analysis produced a large sample of botanical specimens and small flakes of chipped stone from all levels of this deposit.” None of the levels had evidence of compaction, midden, lamination, hearths, post molds, or any evidence suggesting long-term occupation. Friedman’s team also excavated a possible house depression associated with the rock rings. They had excavated it to a depth of 60 cm when time constraints forced them to conclude the unit even though there were still artifacts present. The house depression unit had the richest deposits of cultural material.

Thirteen projectile points were present in the site’s assemblage. Six of these fall within in the Rose Spring projectile point type. The other two complete points were Cottonwood type. The four fragmentary projectile points all fit within the Rose Spring series. These points suggest occupation during the late prehistoric period into the historic era (Friedman 1977:28). Other artifacts included 1 core, 2 bifaces, and 11 modified flakes.
Based on ethnographic accounts and the excavation results, Friedman (1977) concludes that rock rings were not permanent semi-subterranean winter dwellings, but fit better with Garth’s (1953) description of temporary summer shelters. The lack of any recognizable house floor deposits or midden further strengthens the belief that Eagle Lake was seasonally inhabited (Friedman 1977:40). She also concludes that there is no evidence that rock rings have much depth and the ring structure does not continue much below the sub-surface, also supporting a later date for use and seasonal occupation (Friedman 1977:40).

In 1978, Eric Wohlgemuth of California State University at Chico performed a preliminary investigation and evaluation of CA-LAS-345 for the Lassen County Department of Public Works. CA-LAS-345 is located on both sides of Pine Creek, the main tributary of Eagle Lake, which contains substantial trout and sucker spawning runs. Wohlgemuth’s investigation relocated three rock rings close to the shore of Pine Creek. The rings met the size of Garth’s (1953:144) description of “Atsugewi summer circular enclosures of brush, juniper limbs, or rock 10-15 feet (3-5 meters) across with an opening on the east side.” However, there were no surface artifacts inside or around the rock rings at CA-LAS-345 and none of the entries faced to the east. Wohlgemuth (1973:24) believed that “if these rings were summer habitation sites, lithic material would be present throughout the site.” The presence of standing water in two of the rock rings strengthened his argument that the rings at CA-LAS-345 fit with ethnographic accounts of fish traps (Wohlgemuth 1973:24). Ida Pecom, of the Dixie Valley Atsugewi, explained, “My father, who lived in Little Valley, had a pool walled off from the creek by rocks. In spring, trout came in through an opening to escape the muddy waters of the
creek. My father would sneak down in the early morning and put a net over the opening. Then he dipped out the fish with a basket. Sometimes he got as much as two baskets and two nets full of fish” (Garth 1953:137).

While the rock rings at CA-LAS-345 may have functioned as fish traps, they also could have had other uses. Wohlgemuth (1973:25) argues that “in seasons of low water in Pine Creek, the rings may have been used as shelters, saving the efforts of building a structure.” There was evidence in rock ring 4 of a superstructure. Artifacts such as square nails and hand-finished timbers suggest that the structure was present at the turn of the century. Wohlgemuth’s (1973) interpretation of the four rock rings at CA-LAS-345 is important and interesting because it is the only one to challenge the idea that the Eagle Lake rock rings fit Garth’s (1953) description of an Atsugewi summer habitation.

The Pike’s Point site (CA-LAS-537) was excavated again in 1979 to mitigate adverse effects of the construction of a marina. This report and the chronological sequence generated during this project defined the archaeology of the Eagle Lake Basin. Not only did Pippen et al. (1979) create a temporal chronology and geoarchaeological analysis of the Eagle Lake Basin, they also re-evaluated the rock ring first investigated by Friedman (1977) by excavating the entire surface to the soil horizon. They situated one unit in the center of the rock ring and two more outside to test if activities occurred throughout the site or were focused only within the ring. There was a significantly larger amount of material culture within the rock ring unit than in the two units outside of the ring. The unit inside recovered 58 pieces of debitage, 4 utilized flakes, one unidentified contracting stem point, a Gunther short barbed projectile point, a millingstone fragment, and a hammerstone. The units outside of the ring contained only eight pieces of debitage
and a Rose Spring contracting stem projectile point (Pippin et al. 1979:99). The higher proportion of artifacts within the rock ring led Pippin et al. (1979:99) to argue that rock rings were prehistoric habitation features. They also noted that the findings differ significantly from the four rings investigated by Wohlgemuth (1978) at site CA-LAS-345. Pippen et al. (1979:99) point out that the Pine Creek structures (CA-LAS-345) “display true dry-lain masonry; whereas, those at Pike’s Point Site (CA-LAS-537) are little more than a circular clearing of surface rocks.”

Major upgrades to the existing Department of Fish and Game Pine Creek Fish Trap Facility in 2004 necessitated excavation of CA-LAS-345. Feature 1, a rock ring previously mentioned in Wohlgemuth (1973), was excavated during this project. It was described as an elliptically shaped stacked-rock ring measuring 5.7 meters (18.7 feet) east-west by 5.2 meters (17 ft.) north-south, and 50 centimeters (1.6 feet) tall. The stacked rock is four to five courses tall with an opening to the northeast (DeGeorgey 2006:89). Two 1x1 meter units were excavated in the center of Feature 1. The excavation produced a hearth located in the center, one basalt Elko corner notched projectile point, one wire, and one cut metal square nail (DeGeorgey 2006:90-91). Archaeologists were able extract a sample of carbonized wood that yielded a radiocarbon date of 300 +/- 60 B.P. 14C B.P. (DeGeorgey 2006:90-91).

The investigation of CA-LAS-345 also produced a large number of diagnostic projectile points. Archaeologists and volunteers found 25 classifiable and 21 unclassifiable projectile points (DeGeorgey 2006:57). The classifiable points represent seven morphological series: Rose Spring (n = 11), Desert side-notched (n = 2), Gunther
Before these excavations, many archaeologists argued that the rock ring features served as fish traps to capture Eagle Lake trout during the seasonal Pine Creek spawning migrations (Wohlgemuth 1976). After the excavation, the rock ring features at CA-LAS-345 were seen as having served as seasonal habitations for protection from the elements (DeGeorgey 2006:90-91).

CA-LAS-345 shows evidence of occupation beginning 6500 to 6000 years B.P., with an extended and intensive occupation that spans the Middle and Late Archaic Periods (3500 to 600 years B.P.) (DeGeorgey 2006). DeGeorgey (2006:147) explains, “The site was part of an annual cycle of transhumance where hunters and foragers groups migrated to seasonally abundant, highly predictable resources patches as they became available during certain times of the year.” The site functioned as a seasonal camp for hunting deer, birds, and gathering plant resources. The site is optimally located to take advantage of the seasonal spawning migrations of the Eagle Lake trout in Pine Creek.

Themes from the previous excavated rock rings in the Eagle Lake Basin provided support for seasonal upland migration, identified that the features functioned as habitation structures, and provided the foundation to date the features through artifact analysis on diagnostic projectile points. All of the archaeologists that preformed excavations concluded that rock rings were not permanent semi-subterranean winter dwellings, but fit better with Garth’s (1953) description of temporary summer shelters (Pippen et al. 1979; Friedman 1977; DeGeorgey 2006). The projectile points found inside the rock rings include Elko, Rose Spring, Gunther barbed, and Desert side notch. The Rose Spring barbed (n = 1), Cottonwood (n = 1), Elko (n = 6), Humboldt (n = 2), and large side-notched (n = 2).
projectile point type occurred the most frequently out of the two sites diagnostic projectile points. Only one Elko projectile point was found. The projectile point style and their approximate ages will be discussed further in Chapter 5.
Chapter 5
Thesis Sites Research

Introduction

This chapter discusses how sites were selected, decisions made in the field, field methods employed, field recording forms developed, and processing and post processing methods used. The chapter includes discussion of the possible function of the rings and the expected associated artifacts indicative of different functions and possible areas in which these different rock rings occur. A description of the six sites investigated for this thesis follows. The information includes a general description, number of rock rings, associated artifacts, distance to the shore of Eagle Lake, environmental and geologic information, and any other pertinent information, which has been organized into a table. All distances from the lake were measured from the approximate middle of the site to the topographic representation of the Eagle Lake shoreline using GPS points and ESRI ArcGIS. An ancient lake terrace was noticed on aerial views while making maps for this project. The terrace was digitized using ArcGIS. The information obtained by reviewing the sites with the ancient terrace is discussed further in this chapter.

This chapter also includes data collected from the field portion. First, all sites were examined to identify the range of rock ring sizes, number of courses, wall heights, and opening orientation. All rock rings were analyzed together to define the average rock ring range interior diameter along the western shore of Eagle lake. The sites were then examined individually under the same criteria to look for interesting and unique features of the sites. The following section examines the data collected from the lithic analysis in the field to identify the range of activities performed by Native Californian groups inside
the rock rings. All diagnostic projectile points were examined and described in the context of diagnostic point typologies and chronological sequences. Also discussed are other artifacts found such as groundstone, projectile point fragments, and faunal remains.

Site Selections

The six rock ring sites used in this analysis were identified from pre-field research using the Lassen National Forest GIS archaeology layer and site records. US Forest Service site numbers are part of a numbering system that identifies where the site is located. For example, 05-06-58-390 is a US Forest Service site number. The first number 05 identifies the region, the second number 06 identifies the forest, the third number 58 identifies the district, and the last number identifies the site. For this project, the Forest Service site number was still used but a fifth number was added to the sequence, which designates the rock ring feature number at the individual sites.

The following criteria were used in site selection. The number of sites was chosen to allow for a data set large enough so that it could be analyzed in the time frame of the thesis project. Sites 050658-411 and 050658-345 were chosen because they are located at either end of the western shore of Eagle Lake and both have large numbers of rock ring features present. Using these two sites generated enough statistical data to allow the other four sample sites to be picked randomly. To pick the sites randomly, the west shore was broken up into four two-mile zones that are equal in north/south distance. The remaining sites were selected at random by placing site numbers from each zone in a bowl and having a second party pick a site number tag. This technique produced a distributed and diverse site sample. The sites varied in their environmental landscapes, proximity to water, and lava outcrops. The numbers of rings present at the sites were,
respectively, 1, 4, 6, 9, 19, and 24. When resurveying the previously recorded sites, the focus was only on ring features and not on other aspects. This led to more rings being identified, while others were not found or disregarded as non-features. On average, the original number of ring features increased. A total of 69 ring features were investigated for this study, while the site records had only identified 63.

**Field Methods**

Each rock ring was pin-flagged and given a feature number by small groups of trained archaeologists and interested parties. The feature surface and surrounding area were investigated for surface artifacts. Diagnostic artifacts associated with the ring features and within site boundaries were flagged, recorded, and photographed. A 1x1 meter surface scrape unit was set up in the middle of each ring and another outside of the opening if the rocky basalt surface permitted. The logic behind the placement of the units was to locate fire hearths and artifacts that were swept out of the openings while the inhabitants maintained their living/processing surfaces. Only three rock rings received units outside of the ring opening due to time constraints and the soil outside of the rock rings were rocky and hard to dig. Three rock rings with anomalies such as large size and other rock features within the ring received more than one unit. The surface scrape units within the rings were scaled down from a 1x1 meter to an appropriate size that fit the feature.

**Recording Forms**

Rock features were recorded separately with a rock ring feature form that was created by Forest Service Archaeologist Robert Gudino (personal communication, May 2011). The rock ring feature form includes the following:
• General Description (Brief description of individual rock ring)
• Description of Construction Materials (Cobbles, Boulders, materials)
• Maximum Exterior Diameter (Measured in meters)
• Maximum Interior Diameter (Measured in meters)
• Maximum Height (Measured in meters)
• Number of Courses
• Elevation (feet above sea level)
• Damage to the Rock Ring or Evidence of Looting
• Enhanced natural rock features in the construction. (Rock ring constructed around a large boulder or enhancements of rocky outcrop?)
• Orientation of opening (Measured in Cardinal Directions and degrees)
• Lithic analysis description: This section will chart and record lithic material inside the perimeter of the rock ring as well as two meters outside of the perimeter.
• Lithic analysis: Core, biface thinning, pressure, notching, alternating, and unidentifiable flakes. They will be further categorized by size and material. This section will also be broke up by inside the feature and two meters outside. It also will provide an area to account for collected obsidian for hydration and sourcing.
• Associated Artifacts (utilized flake tool, biface, projectile point, ground stone, pendants, etc)
• Environmental and geographic section (An intensive review of environmental features and landforms in the site location)

Field lithic analysis and surface scrape soil description forms were also used during the study. The lithic analysis form accounted for each flake found, describing the flakes in terms of quantity, size, material, and flake type for each ring with associated lithic material. The surface scrape soil description form recorded the size of unit, crew names, excavation methods, screen size, soil type, soil texture, inclusions, fire modifications, and detailed soil description. All three forms together documented an immense amount of raw data. The data have been entered into a database to make it manageable for further analysis. The database will be stored with the Lassen National Forest, Eagle Lake Ranger District. It will also be included in a digital format on a disk at the end of this thesis.
Surface Scrapes and Field Analysis

After the first two weeks of fieldwork, it became apparent that help from generous volunteers was needed to finish in the summer of 2011. One two-day group event occurred in mid-July, where eight volunteers participated in feature recording and surface scrapes of 050658-411. The group was a mix of trained archaeologists and interested parties. Only Jamie Moore, Adam Gutierrez, and the author performed the lithic analysis on 58-411. At the other five sites, the author completed the lithic analyses. Small groups of two to five individuals performed the remaining work.

The arrays of tools used on the study were shovels, pruners, trowels, picks, 5-gallon buckets, and measuring tapes. One-eighth inch screens were used to screen the soil from all surface scrape units for artifacts. The metric system was used for all ring feature measurements (internal diameter, external diameter, wall height). If a ring feature had an opening, it was measured in cardinal direction with a handheld compass. Most of the units had grass, shrubs, and trees growing within the ring features. Grass, duff, and plant material were cleared. Surface scrapes were excavated between 1-3 centimeters. Once all the data were recovered from the unit, it was back-filled and cut plant material was placed on top.

Diagnostic Artifacts

All diagnostic projectile points were collected for the study. Soil samples, obsidian samples, and faunal samples were also collected. Large obsidian flakes and diagnostic artifacts were collected for XRF and hydration tests. Sites 050658-364 and 050658-365 had no obsidian artifacts present.
Pictures

All rock ring features were photographed. For each, one picture was taken facing the opening and an overview picture taken facing towards the north. All diagnostic tools were photographed.

GPS and GIS

Rock rings and diagnostic artifacts were recorded using a GPS receiver. This provided data to perform inter-site and intra-site spatial analysis. All rock rings had GPS points take in the center. Buffers were used to change the points into true representations of the interior and exterior diameters of each ring feature. The vicinity and site maps were created from the project GIS layer. This thesis research employed spatial analysis (SA) to show patterns in the data such as clustering of features, distances to water sources, edible resources, and how rock ring features are distributed on the landscape. These kinds of spatial relationships have become easier to distinguish and manipulate with the advent of global information systems (GIS) software. GIS allows the user to analyze layers of data to distinguish patterns, as well as catalog and quantify artifacts and features, across geographic space. For this project, a Ripley K Function test was run on ARCMAP 10 GIS software to see if the layout of rock ring sites showed a significant clustered pattern. The Ripley K Function determines whether features or the values associated with features exhibit statistically significant clustering or dispersion over a range of distances (ESRI Desktop Help). This test was not performed on Site 05-06-58-364 because it only included one rock ring.

While examining orthorectified aerial photographs in correlation with the project layer, an ancient lake terrace was recognized that possibly fit with the rock ring sites for
this study. The terrace was digitized and site distances were examined to see if there was any statistically significant pattern.

**Data Processing**

Little laboratory processing was needed for the project. The majority of the recovered data were derived from field analysis and data collection. Diagnostic artifacts and obsidian samples were cleaned and catalogued to meet the requirements for obsidian hydration and XRF testing. The Thomas (1981) key for projectile point identification was used. The process of projectile point typing was continued by looking at Greenway (1982), which constructs a region-specific typology for the area. Finally, the diagnostic projectile points were compared to Justice’s (2002) newer, more comprehensive typology.

All rock ring measurements and lithic material data were entered into Statistical Package for the Social Sciences (SPSS). Interior diameter, wall height, and opening orientation data were coded into simple uniform categories for analysis. The lithic material data were recorded in simple uniform categories in the field so they did not need to be recoded again. Faunal and soil samples were collected but the small amount limits their potential as important data; they were examined to add to the thesis and for future studies.

**Oral History, Ethnographies, and Literature Review**

Another aspect of this project was to work with local indigenous communities throughout the different phases of the process. California Indian communities determined the amount of participation. It was important to work with local indigenous communities because the subject matter of the study is their heritage. These communities should have
the opportunity to take an active role in the planning, recording, and analysis of their heritage. This is also beneficial to archaeologists because diverse worldviews inspire innovative ideas and interpretations. Unfortunately, this aspect of the project was pretty much a failure due to the time constraints and the scope of this project. At one Forest Service and Susanville Indian Rancheria (SIR) meeting, the project was proposed and there seemed to be some interest in participation. The next thing I knew, the middle of the 2011 summer field season had arrived and I was working every weekend trying to finish the fieldwork for this project. I take full responsibility for not being able to organize a collaborative event. However, there have been initial talks of furthering this rock ring research by performing full excavation during the summer of 2012 or 2013 on a couple of rock rings at site 05-06-68-345 or other sites outside of the Eagle Lake Basin. Excavation would require proposals to both Susanville Indian Rancheria and the Pit River Tribe at their respective meetings. Hopefully, these meeting will generate some kind of collaborative project.

In preparation for performing oral history for this project, a class in oral history methods was taken from Professor Margaret Purser at Sonoma State University. In this class, we developed questions for our project, defined a location for curation, and filed the proper forms with Institutional Review Board for the Rights of Human Subjects.

Sources for the Ethnographies and Literature Review section were chosen after countless hours of research. The goal was to find as many sources that examined information from Northeastern California as possible. This was easier to do with the ethnographies because many important ethnographers did studies in the area. Other research sources were a little harder to find because much of the research on rock rings is
in the grey literature or contained in documents that were never completed. However, a considerable number of sources were found to support the claims of this thesis.

**Testing the Models: Initial Description of Possible Rock Ring Site Functions**

The site function categories and their anticipated associated artifacts in the following section were derived from the Previous Research section. The different potential functions that were identified include resource caches, dehydration palettes, habitation structure outlines, and hunting blinds. This helped identify the possible functions of the rock rings by creating function categories that used size, associated artifacts and features, rock ring location, and environmental zone to define the potential functions. It must be noted that environments and uses of areas change over time. Sites do not have a single function or designated boundaries; archaeologists create boundaries for land management purposes. A seasonal upland encampment could possibly have had all of these different rock ring functions spread across the useable landscape.

**Resource Cache**

If a rock ring occurs in a pinyon/juniper environment, it has a high probability of being a pine-nut cache (Blair et al. 1997:39). Caches were situated on hardpan, desert pavement and terraces to protect them from rodents and erosion. They were often placed in easily relocated areas and areas that can be seen from a distance (Blair et al. 1997:39). Many were placed along trails and were used as bulking stations from one zone to another or to store supplies for a return journey. Many cache rings have openings. These openings are believed to have functioned as kneeling areas where people were processing or pulling rocks off the top. Rocks were placed on the cached material to hold it down
and prevent scavenging (Blair et al. 1997:39). Smaller cache rings many times have no opening because people just move around the exterior, pulling rocks off the surface.

**Dehydration Palettes**

Dehydration palettes were used to dry seeds, pods, flowers, stalks, or geophytes. Dehydration palettes were often located in areas with close proximity to water, hard radiant surfaces, and sunny or open locations, and were located in resource patches. If many of these types of rings are clustered together, it could mean that the resources would have been abundant (Blair et al. 1999:47). According to Blair et al. (1999:47), “Few artifacts are necessary at drying locations.” The rock walls of dehydration palettes are often one to two courses in height.

**Living Structure Outline (Seasonal and Permanent)**

There is a lack of ethnographic evidence that suggests rocks were used in the construction of living structures throughout Northeastern California and the Great Basin. However, some rock ring sites have features and associated artifacts that resemble those of camp/settlement areas. If they are habitations, the ring feature should be located on a flat and cleared surface. The soil should contain middens and be compacted or depressed. There should be a hearth inside or outside of the ring because people need to cook and keep warm. Artifacts associated with these ring features should include ground stone, lithic debitage, fire-affected rock, and faunal remains. Artifacts should be present even if the area was only used for a brief period. The ring wall would be well defined, with more than one course in height. The exterior of the ring feature would also be well designed to allow people to move through the site without tripping over randomly placed rocks (Blair et al. 1999:64). Such a site should be close to a permanent or seasonal water source. Ring
features should be spatially clustered because extended families often traveled and camped together (Blair et al. 1999:64).

**Hunting Blind**

If rock rings were used for hunting blinds, they generally would be placed on a formation looking over a game trail and water sources such as a spring, lake, creek, etc. The ring would be constructed high enough to conceal the hunter. Often the side concealing the hunter is built up higher (Blair 1999:67). Hunting blinds can also be associated with rookeries or roosts for procuring birds. Artifacts associated with hunting blinds would be lithic materials since the hunters were often active in retouching, creating, and discarding projectile points and bifaces.

**Eagle Lake Sites of the Project**

This section introduces the rock rings investigated for the current project. It also identifies general insights and interesting aspects of the features. In 1980, Roger Werner and crew performed an archaeological survey across the western shore of Eagle Lake. The current project looks at the same sites to investigate rock rings. When the focus of a project is to investigate rock rings, the chances are more will be found than in a quick general survey. This project found more rock rings at the site Werner (1980) recorded. This is not the result of any deficiencies in Werner’s work, but is due to a narrower research focus and technological improvements.

Site 05-06-58-411 has been previously recorded twice: once in 1980 by Roger H. Werner et al. and once in 1995 by Chris O’Brien et al. In 1995, sites 05-06-58-410 and 05-06-58-411 were combined by O’Brien et al. to make one large site with a single site record. For this study, the author and volunteer team only relocated 20 rock rings features
at the site. The site has a very distinctive layout with 11 rock rings clustered together on the top of the lava flow. Many of the clustered rings share common walls. The rock rings on top of the lava flow have the best construction qualities with almost all having significantly vertical walls. Five of the wall heights were over 60 cm; none of the other sites investigated for the current project had such tall walls.

Figure 5.1. Site 58-411, Feature 7, Overview, View North.

Figure 5.2. Site 58-411, Feature 11, Overview, View North.
Very few surface artifacts were found. Both previous site reports noted that the site had been heavily looted. Werner (1980) noted that some rings had been illegally excavated and a quarter-inch screen was located within one ring. During the current study, evidence of looter piles was found throughout much of the project area. Also, heavy grass and sagebrush could have been a culprit in the lack of surface artifacts. However, once the grasses were cleared and the surface screened, artifacts were found in almost all of the rings at 05-06-58-411.

Site 05-06-58-382 was originally recorded with six rock rings, but this investigation found seven. Although the new ring was deflated and a poor example, it was tested anyway to see if it had any cultural material. All of the rock rings at this site were of poor construction qualities. This site was hard to find because the Universal Transverse Mercator (UTM) coordinates plotted the site 1200 meters away from the Eagle Lake shore. This area was resurveyed for the current study, but no rock ring features were found in the area. The location map in the site record indicated that the site was located much closer to Pelican Point so that area was surveyed to locate any sites that fit the description. A site was found that fit the general description of site 05-06-58-382. However, the Lassen National Forest Archaeology layer on ArcGIS with all recorded sites shows the GPS points taken for this project are 25 meters to the northwest of site 05-06-58-378. The site record of 05-06-58-378 describes the site as a light basalt scatter associated with three rock rings and three hunting blinds. The site that was investigated for this project fits more with the description and location of 05-06-58-382 than with 05-06-58-378.
Located directly to the east of the site, Pelican Point is a large point that significantly juts into the lake. It is known as a place where waterfowl congregate and as a good fishing area for Eagle Lake trout. In prehistoric times, this place would have been a resources hub. Interestingly, there are many small clusters of rock rings across the bluffs above Pelican Point. All of these small sites are most likely associated with one another temporally and spatially. The way that archaeologists designate site boundaries has affected the way this site has been viewed. I argue if all of these small site features had been recorded individually and then brought together, the importance of this area would become obvious.

Figure 5.3. 58-382, Feature 2, Overview, View West.

Site 05-06-58-365, or the Bench Mark Ring site, was originally recorded as having four rock rings; only three rock rings were found and investigated. The site is
located right below the crown of a low-lying vesicular basalt flow running north/south. The important aspect of this site is the close proximity to Slough Point and Eagle Lake directly to the east. The surface scrapes at this site did not find any artifacts inside of the rock ring features. The only artifacts found were surface artifacts that include one multifaced grinding stone that was located inside of feature one and three simple basalt EMFs that were found spread on top of the basalt flow. This suggests that these rock rings functioned in a different capacity than habitation. It is unfortunate that the random site selection did not select other sites similarly close to the modern lake level. At this point, the only conclusion that can be made is that this site was different from the other five sites investigated for this project, due to the lack of artifacts, proximity to lake, and lack of tree coverage.

Figure 5.4. 58-365, Feature 1, Overview, View North.
The rock ring at site 05-06-58-364 was the poorest example of a rock ring feature across all sites for this study. The rock ring walls are not contiguous and barely formed. This site was investigated because no other sites in this study had an isolated rock ring. Unfortunately, very little data were derived from the ring. A case could be made that this feature is not even a rock ring but the results of clearing the large rocks from the surface of the area for some use.

Site 05-06-58-345 was one of the most diverse and complex site investigated for this project. Almost all rock rings had a large amount of lithic debitage inside of them. Rock Ring 05-06-58-345-F15 was the largest rock ring investigated for this project, with an internal diameter of 5.1 meters (16.75 feet) and an external diameter of 8 meters (26.25 feet). The ring also contained a large amount of lithic debitage and groundstone fragments. There was evidence of looting, with many looter piles located on the tops of rocks.
The site has an interesting layout where the rock rings are clustered in small groups along the lava flow. The layout was different than site 05-06-58-411, where most of the rock rings were clustered on top of the lava flow in a large group. This difference in site layout could be due to the tree coverage that acts as a natural windbreak. 05-06-58-345 has trees and lava flows that act as wind breaks, while 05-06-58-411 has no wind defense. It is possible the clustering of rings together was a purposeful way to lessen exposure to the wind.

Site 05-06-58-390 shares a similar layout to 05-06-58-345, with the rock ring distributed along the edge of a northwest-southeast running lava flow. Many of the ring features share common walls and are grouped together. Some evidence of looting is present and a modern campfire ring has been incorporated into the side of 05-06-58-390-
10. Local fishing enthusiasts know Wildcat Point as a great spot for shore fishing. Wildcat Point has three other rock ring sites located nearby. Many great examples of rock rings are located throughout the Wildcat Point area. In the future, it would be important to re-investigate the entire area and map all features to see if these sites can be consolidated into a larger site.

![Image](image_url)

Figure 5.6. 58-390, Feature 7, Overview, View West.

**Rock Rings Feature Analysis**

The sizes of all the rock rings were examined together to determine their range. For this thesis, 61 interior wall diameter measurements were examined. The original range of sizes varied by only centimeters. The data did not produce any significant patterns, so they needed to be reorganized. Rock ring sizes were re-coded into groups of
50 centimeters (1.64 feet) to consolidate the date and illustrate patterns. The following (Figure 5.7) shows the original distribution of interior rock ring diameters before re-coding.

![Graph showing frequency of rock ring diameters.](image)

**Figure 5.7. Frequencies of Original Rock Ring Diameters.**

The data show a slight increase in frequency in size between 2.9 to 3.2 meters (9.5 to 10.5 feet). The ring features with two interior diameter measurements are rock ring that were more oval than circular in shape. These oval-shaped rock ring features are discussed further below in the context of their respective sites. The following (Figure 5.8) shows the data organized into 50 centimeter (1.64 feet) groups starting at 1 meter (3.28 feet).
Table 5.1. Grouped Interior Diameters.
The consolidated interior diameter data shows that 75.8 percent or 46 of the rock rings are between 2.1-3.5 meters (6.8” to 11.5 feet), a range of 1.4 meters (4.6 feet). One to 2 meter (3.28-6.56 foot) diameter rings make up 9.8 percent of the total sample with six rings in that category. The remaining 14.7 percent is between 3.6-6.0 meters (11.8-19.68 ft.) with a total of nine rings in the category. Instead of defining an average size, an average range of sizes seems to be more appropriate for this study since the data have such a range. The average size range is between 2.1-3.5 meters (6.9-11.5 feet).

Number of courses and wall heights are discussed together because they measure the same aspect of wall height, just using different measurement classes. Course heights are the identifiable layers of stacked rock that make up rock ring walls. Wall heights were measured in centimeters from the surface to the top of the wall. Rock ring wall heights and courses have likely been altered over time due to both human and natural causes. Similar to the rock ring interior diameter data, the height data for the walls were dispersed due to exact measurement so the data were consolidated to make it useable.
In total, the heights of 55 of 61 rock ring walls were examined; the six rock rings that had no measurements were unmeasured because of mistakes in the field. The data

Table 5.2. Rock Ring Wall Heights.

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Figure 5.9. Rock Ring Wall Heights Grouped.
show that 49 rock rings or 69 percent of the wall heights range from 10-50 centimeters (4-20 inches). The two categories with the highest frequencies of wall heights were 21-30 centimeters (8.25-11.8 inches) and 31-40 centimeters (12.2-15.75 inches), making up 24/55 or 43 percent of the total sample. The data makes a nice bell curve with only three outliers in the range of 71-100 centimeters (28-39.4 in.). These outliers will be discussed in their respective site analysis.
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<td>18.0</td>
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<td>4.9</td>
<td>90.2</td>
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<td>98.4</td>
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</tr>
<tr>
<td>Total</td>
<td>61</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.3. Number of Courses (Grouped).

Out of 61 rock rings sampled, 60 rings were examined for number of courses. The majority of rock rings had multiple courses. When this occurred, both course heights were recorded. This skews the data by creating more categories of course numbers. It can be argued that the rings with multiple courses are caused by ring collapse and the true number of courses would be the higher of the two. Number of courses ranged from one to five courses in height. Fifty-one out of 61 or 90.2 percent of the rock ring course heights fell between 1-3 courses tall.

Opening orientation was recorded in cardinal directions in the field and reorganized into forty-five degree groups for analysis purposes. Ethnographic accounts state that habitation structure entries were orientated to the east so the inhabitants could see the rising sun through the opening. Another factor in opening orientation was to place it opposite the direction of the local prevailing winds. The winds in the Eagle Lake area are normally out of the south-southwest and can become very violent in the afternoon.
Figure 5.10. Door Orientations in 90 Degree Quarters (Grouped).

In total, 61 rock rings were examined for opening orientation. The data show that 22 or 36 percent of rock rings had no identifiable opening. Four or 6.6 percent of the rings had multiple opening orientations. Twenty-six or 42.7 percent of the rings had identifiable openings oriented between 0 and 135 degrees, which is opposite the local prevailing winds. Northwest is an opening orientation that would also afford protection from the wind and there were four or 6.6 percent of the total sample. The remaining five opening orientations fall between 136 degrees and 315 degrees.

In conclusion, the majority of rock ring features had identifiable opening orientations faced the opposite local winds. The fact that almost a quarter of the sample having no opening in the ring wall limited the significance of the outcome. However, it is
theorized that rock rings without openings also function as habitation areas. To enter these ring features, the inhabitants stepped over the low rock ring wall. This conclusion is based on the associated artifacts that were indicative of habitation, which were found in both of the rock rings with different entry types.

**Site Construction Measurements**

Site 58-411 had 19 rock rings features that were investigated for this project. The rock rings at this site were some of the best examples of rock rings examined throughout the project area. All of the rings were easily identifiable and many had large interior diameters and wall heights. The sizes ranged from 1.9 to 4.5 meters in diameter. The average interior rock ring range was between 2.6 to 3.5 meters with 12/19 or 63 percent between these two categories. This site has some of the largest rock rings across the western shore with three rock rings measuring 3.9, 4.4, and 4.5 meters, respectively. Wall heights ranged from 30 to 92 centimeters, with 15/19 or 79 percent of the rings between 30-70 centimeters. The most frequent wall height is 41 to 50 centimeters with 5/19 or 21 percent of the total sample. This site also had some of the largest wall heights across the western shore with two rings measuring 90 and 92 centimeters, respectively. The number of rock courses ranges from 1-2 to 3-5 with 5/19 or 26.3 percent in 2-3 course categories. Out of 19 ring features, only 12 had identifiable openings in the ring walls. Eight out of 19 or 36 percent of the ring openings faced between 0-135 degrees. Four out of 19 or 21 percent faced between 181-390 degrees. These data suggest that when rings had openings they faced a direction that was opposite of the Eagle Lake prevailing winds.

An interesting aspect of site 58-411 was that the majority of rock rings investigated shared common walls. Rock ring features 6 to 16 are interconnected. The
connected rings are located on the crown of a low-rising basalt and dirt outcrop. This kind of clustering and connectedness was also seen at 05-06-58-390, 05-06-58-345. It is possible that the rings were connected and clustered together to cut down on the wind. The site is located in an open area with sparse trees and no other natural windbreaks. The clustered ring features act as a windbreak and protect the majority of the rock ring. Rings were not placed on the northern side of the outcrop because it is likely when these features were in use the lake was surrounding the outcrop. This will be discussed further in this chapter. Rock ring feature 14 is an average-sized ring feature that has an interior diameter of 3.2 meters. Once the sagebrush was removed, a much smaller rock ring was identified along the northeastern side of the ring. The smaller ring has an interior diameter of 1.1 meters and is lined with rocks. A 50x50 centimeter surface scrape was placed into the smaller ring. The scrape produced four obsidian flakes, two basalt flakes, and a basalt metate fragment that measured 9 by 7 centimeters. It is possible that this smaller ring inside of ring feature 14 functioned as a storage area for the inhabitants of the ring.

Rock ring feature 10 was poorly constructed and had an interior diameter of 3.9 meters. The poorly defined walls of this unit appear to be created by surrounding ring features 11, 7, and 9. It also had an opening oriented to the south. In the middle of the rock ring, we placed a surface scrape unit. Inside the unit, four flakes were found, a drastic decrease from the surrounding rock ring features. Because of this feature’s attributes, it is theorized that it functioned as a common area or in-between area to get to other rock ring features. However, more research is needed that focuses on such features to substantiate these assertions.
Six rock rings were investigated in Site 05-06-58-382. The majority of the rock rings at this site were poorly defined. The rock ring features were constructed out of small to medium-sized angular boulders. Rock ring interior diameter at the site ranged from 2.8 to 3.4 meters (9 to 11 feet). The sizes of the six rock rings were evenly dispersed
between two categories: 2.6 to 3 meters (8.5 to 9.8 feet) and 3.1 to 3.5 meters (10.2 to 11.5 feet). Wall heights ranged from 10 to 40 centimeters (4 to 16 inches), the most frequent wall height being 31-40 centimeters (12 to 16 inches) with three of the total sample. The course heights were evenly distributed between 1, 1-2, and 2 courses tall. Out of 6 rock rings, 2 did not have any opening. One ring had multiple openings. Two had openings between 0 and 90 degrees and one had an opening that faced 271-390 degrees. Again, the date shows when the rock rings had openings in the ring wall the inhabitants placed them opposite the local wind direct.

Site 05-06-58-0382 did not have any interesting aspects or features. The most notable attributes about the area were the plants that grew in the area and the proximity to the lake. A chokecherry shrub was growing out of rock ring Feature 4, but it did not occur anywhere else in the general vicinity. Local Indians used chokecherry as a source of food. In addition, the paste from the leaves was used to poultice cuts, sores, and bruises. It is known to promote rapid healing (Garth 1953:140). The site is located on a slight rise with a western aspect, 170 meters (560 feet) to the west of Eagle Lake. This site was one of the closest sites to the lake. The poorly constructed design of the rock ring and lack of associated artifacts suggests that these features were might have functioned in a different capacity or a short use period like those at sites 58-411, 58-390, and 58-345.
Site Map: 05-06-58-0382

Site 05-06-58-365 had three rings investigated for this project. The rings at this site are well defined and constructed out of medium-sized square boulders from the lava flow they are built on. Rock ring interior diameters ranged from 1.6 to 3.0 meters (5.25 to
9.84 feet). The most frequent size category is between 2.6-3 meters with two rings in this category. With only three rock ring features, no significant patterns were present. Wall heights range from 31-60 centimeters (1-2 feet) and the three rings are evenly dispersed between the three height categories. Course height range from 1 to 2-3, and the three features are evenly dispersed between the three course height categories. One feature had no identifiable opening and two opened between 0 to 90 degrees.

The interesting aspects of 05-06-58-365 are the environmental setting, plants, proximity to the lake, and the lack of artifacts found at these relatively defined rings. The rock ring features are located to the west of a north-south oriented basalt outcrop. The area has no tree coverage, and mixed grasses and small sagebrush dominate the understory. Inside rock ring Feature 1, a chokecherry shrub is growing in the northern section near the opening. This site is also relatively close to the lake at only 178 meters (585 feet) to the west. None of the surface scrapes inside of the ring produced any lithic material. Rock ring feature 1 had a double-sided metate on the surface. Two surface scrapes were done in feature 1; one inside the middle and the other located in the opening. No artifacts were found in either. Across the site only four large, dark basalt flakes and one crude biface were found. The data from these ring features suggest that they functioned as specialized processing areas such as dehydration stations for plant resources. However, more research is needed that focuses on these types of rock rings, which are close to the shore and with no tree coverage.
Site Map: 05-06-58-0382

Figure 5.13. 05-06-58-365 Site Map.

Site 05-06-58-364 has a single poorly defined rock ring feature. The interior diameter of the ring feature is 3.2 meters (10.5 feet), and the highest wall height is 51 to 60 centimeters (1.7 to 2 feet) though the majority of the walls are much smaller. The ring
was not contiguous; some of the walls were a single course high and the opening orientation was between 0-90 degrees. This rock ring was a very poor example and not like any of the other rock rings examined for this project.

Site 05-06-58-345 had 23 rock rings identified on previous site records. For this thesis, due to time constraints, only 20 rock rings were investigated. This site had the most rock ring features of any in this study. Most of the rings at the site had defined walls and floors and many were attached together by common walls. The interior diameter range between 1.5 and 5.1 meters (4.9 and 16.75 feet). The interior diameter that occurred most frequently, with 7 or 35 percent of the total rings, was 2.1 to 2.5 meters (6.9 to 8.2 feet). One of the largest rock rings examined for this study was at this site. Rock ring 15 had well defined walls that were 2-3 courses high and had an interior diameter of 5.1 meters (16.74 feet). The wall heights at the site ranged from 20 to 70
centimeters (7 to 27 inches), with 9/23 or 45 percent of the total sample between 21 and 30 centimeters (8 and 12 inches). The number of courses ranged between 1 to 3-4, with 8 or 40 percent between 1-2 courses tall. Door orientations were interesting at this site, as 7/20 or 35 percent did not have any identifiable openings. Another 8/20 or 35 percent of rock rings had openings that faced between 0 to 135 degrees. Two or 10 percent of the rock rings opened to 136 to 270 degrees and 3 or 15 percent opened between 271 and 390 degrees. The orientation between 271 and 390 is also opposite the local prevailing winds.

Figure 5.15. 05-06-58-345 Site Map.

Site 05-06-58-345 has many interesting and unique aspects. Most notable is feature 4, which seems to be more of a depression or house pit than a rock ring. A surface scrape was placed in the center and the unit uncovered 34 total flakes, a non-diagnostic basalt projectile point tip, a Desert side-notched projectile point, and two unidentifiable
bone fragments. The artifacts found inside of the depression are similar to the range of artifacts found inside of the majority of rock rings at site 05-06-58-345 and from the other sites on the western shore of Eagle Lake. One possibility is that rock rings and house depressions serve the same general purpose as habitation areas. The difference is the material and the soil they are constructed into: if the soil is rocky and mostly impenetrable, the frame of the structure sits on the surface with circular rock walls anchoring it to the surface. If the soil is loose, the frame of the structure can be anchored into the soil. More research needs to be done at sites where both rock rings and house pits occur to see if these claims are significant. The research focus for this project was on rock rings, so it is possible that house pits were missed during the investigation.

Feature 15 was one of the largest rock rings recorded along the western shore of Eagle Lake. The interior diameter was 5.1 meters (16.74 feet). Two surface scrapes were set up in the middle of the feature. The units produced 226 flakes, the highest flake total out of all the rock rings investigated for this project. Artifacts also included three bone fragments, two biface fragments, two polished handstone fragments, and a metate on the surface. This ring feature also shared a common wall with rock ring feature 13 and is clustered with rock ring features 14 and 16. Feature 14 contained 84 total flakes, a biface fragment, a projectile point, and two obsidian serrated projectile point tips and one serrated projectile point fragment. No other projectile points found during this investigation were serrated. This style could indicate that this rock ring was used by different native California group or during a different time-period, however a larger sample and more research is needed for definitive conclusions. Projectile points will be discussed further below.
The last site investigated for this project was site 05-06-58-390. The twelve rock rings at this site have well defined walls constructed out of small boulders. Many were constructed on the southern side of a large basalt lava flow. The walls at this site are wide, possibly due to walls falling over or from clearing the surface of rocks inside the feature when first constructed. The interior diameters at this site ranged from 2.3 to 3.5 meters (7.5 to 11.5 feet). This site has two rock rings that are more oval than circular; these features have much larger interior diameters. Feature 5 had an interior diameter of 7.5 meters (24.6 feet) N/S and 5.2 meters (17 feet) E/W. Feature 8 had interior diameter of 7.5 meters N/S and 5.2 meters E/W (24.6 and 17 feet). The rock ring interior diameter category that occurred the most frequently 2.1 to 3 meters (6.9 to 9.8 ft.) represented by 5/12 or 41 percent of the total rings. The wall heights were relatively smaller than the other heights for this project; they ranged from 14 to 40 centimeters (5.5 to 15.75 inches).
The wall height with the highest frequency was 10 to 20 centimeters (4 to 8 inches) with 5/12 or 41 percent of the total sample from the site. The number of courses ranged between 1 and 2-3, with 7/12 or 58 percent in the 1-2 category. Five of the 12 or 41 percent of the rock rings did not have any identifiable opening. Five of the 12 rock rings opened between 46-90 degrees. Two rock rings also had multiple entries.

**Figure 5.17. 05-06-58-0390 Site Map.**

Interesting and unique aspects of site 05-06-58-390 included similar in-between features to those at 05-06-58-411. Feature 5 was an oval shaped features whose walls were formed by features 4 and 6. Rock rings 4 and 6 had a significant amount of lithic material and artifacts, while feature 5 only had two flakes and a possible groundstone
fragment. This suggests that rock rings feature 5 served a different purpose than the other rock ring features. The other notable aspect was the amount of lithic material and formed tools found at this site, discussed below.

**Lithic Material Analysis**

Across the six sites investigated, 1,625 pieces of lithic debitage were found and analyzed for quantity, size, material, and reduction type. Materials found included basalt, obsidian, and cryptocrystalline silicate (CCS). Reduction types included core, biface, pressure, and unidentifiable/shatter. All of the unidentifiable flakes or shatter were discarded, leaving 896 pieces of debitage to be analyzed. The data were entered in SPSS and processed. When the lithic material was examined across all sites together, it became clear that obsidian and basalt were the two most commonly used tool stones, while CCS was barely used. Total flakes of both obsidian and basalt show no significance in preference of materials.

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<th>Sites</th>
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<th>Total</th>
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<td>179</td>
<td>17</td>
<td>403</td>
</tr>
<tr>
<td>364</td>
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<td>0</td>
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<td>57</td>
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Table 5.4. Lithic Debitage by Material and Sites.

This section examines material and lithic reduction type by site. Sites 58-411, 58-345, and 58-390 were examined to see if the inhabitants of the rock rings were using basalt, obsidian, and CCS for different tools. The sites previously mentioned were chosen because they have relative large amounts of lithics, potentially producing significant patterns. The basalt pressure flakes might be skewed because lithic analysis was
performed in the field and obsidian and CCS flakes covered in dirt can be mistakenly identified as basalt pressure flakes. It also should be noted that Jamie Moore, a professional archaeologist, identified more CCS flakes than the author while performing the lithic analysis, likely meaning that some obsidian flakes and CCS flakes were misidentified when the author was working alone.

**Site 05-06-58-411**

<table>
<thead>
<tr>
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</tr>
</thead>
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<tr>
<td>Biface Thinning</td>
<td>46</td>
<td>52.9</td>
</tr>
<tr>
<td>Pressure</td>
<td>27</td>
<td>31.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>87</strong></td>
<td><strong>100.0</strong></td>
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</table>

**Site 411 CCS Lithic Reduction**

<table>
<thead>
<tr>
<th>Reduction Type</th>
<th>Amount</th>
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</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>Biface Thinning</td>
<td>10</td>
<td>55.6</td>
</tr>
<tr>
<td>Pressure</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

**Site 411 Basalt Lithic Reduction**

<table>
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</tr>
</thead>
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<tr>
<td>Pressure</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>119</strong></td>
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</tr>
</tbody>
</table>

Table 5.5. 05-06-58-411 Lithic Material and Reduction Type.

The amount of lithics for this study was small, so only general interpretations can be made. The data shows that bifacial thinning flakes were produced the most frequently out of obsidian, CCS, and basalt at site 05-06-58-411. The local basalt reduction showed a higher amount of core flakes, suggesting that the local people had more access to basalt. The obsidian lithic reduction showed a small amount of core flakes and a larger amount of biface and pressure flakes. This suggests that they were producing projectile points more often from bifaces or blanks than from cores. The CCS is a small sample containing
18 flakes, suggesting they did not have much access to CCS or they favored basalt and obsidian.

**Site 05-06-58-345**

<table>
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</thead>
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<td>Biface Thinning</td>
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<td>Pressure</td>
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<td>93.2</td>
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**Obsidian Lithic Reduction**

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</thead>
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<tr>
<td>Biface Thinning</td>
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<td>41.2</td>
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<tr>
<td>Pressure</td>
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<tr>
<td>Total</td>
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**CCS Lithic Reduction**

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</thead>
<tbody>
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<td>16</td>
<td>8.9</td>
</tr>
<tr>
<td>Biface Thinning</td>
<td>49</td>
<td>27.4</td>
</tr>
<tr>
<td>Pressure</td>
<td>114</td>
<td>63.7</td>
</tr>
<tr>
<td>Total</td>
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**Basalt Lithic Reduction**

<table>
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<tr>
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<th>Percentage</th>
</tr>
</thead>
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<td>16</td>
<td>8.9</td>
</tr>
<tr>
<td>Biface Thinning</td>
<td>49</td>
<td>27.4</td>
</tr>
<tr>
<td>Pressure</td>
<td>114</td>
<td>63.7</td>
</tr>
<tr>
<td>Total</td>
<td>179</td>
<td>100</td>
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</tbody>
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Table 5.6. 05-06-58-345 Lithic Material and Reduction Type.

Site 05-06-58-345 has some interesting lithic reduction that differed from 05-06-58-411. Between the three material categories, the lithic reduction stage that is most frequent is pressure debitage. Obsidian pressure flakes make up 93 percent of the total obsidian sample. This suggests the inhabitants of the rings were not creating new tools using the full lithic reduction process; they were simply retouching tools and blanks that they brought with them. The CCS reduction category is small with 17 flakes total; 88 percent of the sample are between biface and pressure flaking. The basalt reduction category shows that pressure flaking occurred the most, but the inhabitants were also producing some bifacial thinning flakes and core flakes. This suggests the inhabitants of the site had more access to basalt and they were performing the full lithic reduction
process on it, most likely making simple processing tools such as bifaces, scrapers, and edge modified flakes.

**Site 05-06-58-390**

<table>
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</tr>
</thead>
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<tr>
<td>Biface Thinning</td>
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<td>Pressure</td>
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<td><strong>Total</strong></td>
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<table>
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<th>Reduction Type</th>
<th>Amount</th>
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</tr>
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<tr>
<td>Core</td>
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<td>18.9</td>
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<tr>
<td>Biface Thinning</td>
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<td>Pressure</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>95</strong></td>
<td><strong>100</strong></td>
</tr>
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</table>

Table 5.7. 05-06-58-390 Lithic Material and Reduction Type.

Site 05-06-58-390 had similar lithic reduction stages as site 05-06-58-345. Obsidian was mostly found as pressure flakes, making up 88 percent of the sample. CCS was sparse, represented by only 12 flakes. Basalt seemed to be used for all the lithic stages, but biface and pressure made up 80 percent of the sample. Basalt was used for simple formed tools and all lithic stages are present. These data suggest that the inhabitants were using obsidian for mostly formal tools such as projectile points. This could mean that obsidian was scarce and was a prized tool stone and was only used for projectile points. As in all of the sites, CCS was barely used and only makes up a small amount of the total sample.

In conclusion, because these lithic samples are small it is hard to generate significant interpretations about possible activities. However, Site 58-345 and 58-390 do
show that obsidian was pressure flaked more often than it was reduced from a core. This suggests that the groups in the area were retouching tools and/or creating tools from preformed blanks. With one exception, all of the projectile points found in this study were obsidian. The only exception, a basalt point, was crude and its type was unidentifiable. All of the other tools, such as edge-modified flakes (EMF), bifaces, and scrapers, were manufactured out of dark grey basalt. This suggests that activities conducted in the rock rings included retouching and producing projectile points from obsidian blanks as well as creating simple processing tools, most likely from local basalt. These lithic activities suggest they were creating tools for hunting, gathering, and processing edible resources. These two activities fit nicely with the theory that these rock rings were part of a seasonal upland migration adaptive strategy. The objective of a transhumance adaptive strategy is to hunt, gather, process, and store as many resources as possible to take back to the winter village. Lithic analysis themes such as obsidian hydration and sourcing, and the frequency levels between the different lithic material should be the investigated in future work. This will be discussed further in Chapter 6.

**Projectile Point Analysis**

This project found 13 projectile points. Three of the 13 points could not be associated with a specific projectile point class because the points either were missing key typology indicators or did not have well defined features. Justice (2002:1) points out that point types are usually grouped one of two ways: “into series, which reflect types closely associated in time and space, or into clusters, which reflect morphological and technological similarities.” Additionally he cautions, “Some projectile point types may include other kinds of symmetrical, bifacial tools, such as knives, rather than projectile
points” (Justice 2002:1). Thomas’s (1981) projectile point classification guide was originally used to type the projectile points because it uses specific measurement to define the type. The typed points were then compared to Greenway (1982), who examined 478 projectile points from an excavation at Deadman Cave, located in the foothills east of Red Bluff, California. Greenway (1982) created a regional specific typology for the southern Cascade Mountain foothills of northern California.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Feature Number</th>
<th>Material</th>
<th>Projectile Point Type Thomas 1981</th>
<th>Projectile Point Type Greenway 1982</th>
<th>Dates Justice 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>58-411</td>
<td>F5</td>
<td>OBS</td>
<td>Rose Spring Contracting stem(Reworked)</td>
<td>Southern Cascade Corner Notch, Type :13</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>58-411</td>
<td>F7</td>
<td>OBS</td>
<td>Rose Spring series, Missing base</td>
<td>Southern Cascade Corner Notch, Type :13</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>58-382</td>
<td>F5</td>
<td>OBS</td>
<td>Rose Spring Straight Stem,(Reworked)</td>
<td>Southern Cascade Corner Notch, Type :13</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>58-345</td>
<td>F4</td>
<td>OBS</td>
<td>Desert Side Notch Broken</td>
<td>Desert Side Notch Type 15</td>
<td>700 B.P.- Historic Period</td>
</tr>
<tr>
<td>58-345</td>
<td>F14</td>
<td>OBS</td>
<td>Rose Spring Straight Stem, Missing tip</td>
<td>Southern Cascade Corner Notch: Type 13</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>58-345</td>
<td>F17</td>
<td>OBS</td>
<td>Dart Point/Atlatl Point , Reworked, Missing Base</td>
<td>Has similar blade reworking to Kingsley Expanding Stem Type: 34. Missing bases so Unidentifiable.</td>
<td>Unknown</td>
</tr>
<tr>
<td>58-345</td>
<td>F21</td>
<td>OBS</td>
<td>Rose Spring series</td>
<td>Southern Cascade Corner Notch, Type :13</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>58-345</td>
<td>F23</td>
<td>OBS</td>
<td>Rose Spring series</td>
<td>Southern Cascade Corner Notch, Type :13</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>390</td>
<td>F4-1</td>
<td>OBS</td>
<td>Possible Rose Spring or Gunther Barbed Missing tip and base.</td>
<td>Unidentifiable</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>390</td>
<td>F4-2</td>
<td>OBS</td>
<td>Rose Spring series, Reworked.</td>
<td>Southern Cascade Corner-Notch, Type: 13</td>
<td>1500 to 700 B.P.</td>
</tr>
<tr>
<td>390</td>
<td>F11</td>
<td>OBS</td>
<td>Desert Side Notch</td>
<td>Desert Side-Notch, Type 15</td>
<td>700 B.P.- Historic Period</td>
</tr>
<tr>
<td>390</td>
<td>F11B</td>
<td>Basalt</td>
<td>Possible Martis Corner or Elko Notch, Crude Unidentifiable</td>
<td>Possible Elko Corner Notch Type: 33</td>
<td>Unknown</td>
</tr>
<tr>
<td>390</td>
<td>F12</td>
<td>OBS</td>
<td>Desert Side Notch</td>
<td>Desert Side-Notch, Type 15</td>
<td>700 B.P.- Historic Period</td>
</tr>
</tbody>
</table>

Table 5.8. Diagnostic Artifacts.
Six of the projectile points type to the Rose Spring series or the Southern Cascade corner notch, type: 13. The California corner notch, type: 13 is defined as being small to medium in size and triangular, pentagonal, and ovate in shape (Greenway 1982:144). The stems are either contracting or straight and terminate into a base that is straight or slightly convex. The stem width equals or exceeds stem length. In addition, many have broad shoulder widths and short stem lengths (Greenway 1982:144).

Justice (2002: 320) has reorganized the Rose Spring series into the Rose Gate cluster. The Rose Gate cluster combines the Rose Spring corner-notch, Eastgate expanding-stem, and the Parowan basal notched points. According to Justice (2002:320), “These points were normally made from small blanks by pressure flaking as well as small bifaces resulting in ovate to trianguloid performs with irregular and chevron flaking patterns.” This type is considered one of the first, if not the first, arrow point in the Great Basin, and it is dated to the early part of the Late Prehistoric. The estimated age of this type is between 1500 to 700 B.P. (Justice 2002:321.) The Rose Spring replaced the Elko corner notched, and it was in turn replaced by the Cottonwood triangular and Desert side notched arrow points. Rose Spring points are distributed across much of the Great Basin, including eastern California, Nevada, Utah, southern Idaho, and southeastern Oregon (Justice 2002:330).

Three of the projectile points were typed to the Desert side notch point series. Thomas (1981) and Greenway (1982) both agree on the Desert side notch type. This type is the easily the most recognizable projectile point style in the Great Basin and California. The Desert side notch is broken up into four subtypes: general, Sierra, Delta, and Redding (Justice 2002:379). The three projectile points for this project seem to fit the
general subtype because they lack the fancy and extreme extensions of the barbs and the deep concaved bases.

The Desert side notch projectile point is defined as a triangular form with a straight to concave base with side notches (Justice 2002:379.) The side notches are placed below the midpoint of the blade, leaving angular ears on the haft (Justice 2002:379). This point type appears during the Late Prehistoric period. Evidence suggests a beginning date in California and Great Basin at 700 B.P. and proceeding until historic times (Justice 2002:384). The most common materials for these projectile points are obsidian, CCS, and even glass (Justice 2002:384). According to Justice (2002:286), “Desert side notched points and similar arrow points were used over most of western United States in all geographic provinces including the Great Basin, California, the Plains, and Southwest.” However, this type designation is primarily used in literature of the Great Basin and California (Justice 2002:386).

One point is much larger than the other points found during this project. This large point has evidence of heavy reworking (Figure 4.27). The width of the blade is larger or equal to the length of the blade. Unfortunately, this projectile point is missing the base, making it difficult to assign it to a definitive type class. The size of the point suggests that it is a dart point instead of an arrow point. The obsidian source and hydration of this point will be important in determining a relative age and providing evidence to type it. This point shares similarities with the Bucks Lake widestem point, originally defined from the investigation at Rainbow Point site, in Plumas County. These points exhibit the essential attributes of Borax Lake widestem points including a notable resharpening strategy (Justice 2002:107). Borax Lake widestems have a concave base and
a square base variant. According to Justice (2002:107), “Nearly all of the known Borax Lake widestem specimens appear to be in an advanced state of blade resharpening and very few examples with nearly pristine blades are reported.” The repeated resharpening of the blade produces excursive edges and a shortening of the blade into a triangular form. The shoulders of the blade are often destroyed during the resharpening process. This point type averages approximately 7500 to 4500 B.P. in age (Justice 2002:108).

Although it is not possible to definitively claim this point is a Bucks Lake widestem, it is worth illustrating the similarities between this type description and the point found in this study. If the hydration reading produces a thick hydration rim, then there are two possible scenarios. The more plausible scenario is that the point was found and brought back to the rock ring so it could be remanufactured into a new tool. The second possibility is that the rock rings are much older than believed previously. If the projectile point hydration rim produces an older date, a full excavation should be performed on site.
Groundstone artifacts were found at four of the six rock ring sites; the sites that did not contain groundstone were 05-06-58-0364 and 05-06-58-0382. A notable theme concerning the groundstone was that all of the items found were metates and manos. This suggests that the people using the rock rings were processing material that did not require much pounding. Thus acorns and other nuts, which require the use of the mortar and pestle, were not processed and used in this area; instead, people were processing seeds and soft plant material. The majority of groundstone was located during screening the surface scrape material. Manos were only found in fragmentary form. Site 58-411, containing one of the highest numbers of rock rings, did not have very much surface groundstone. This could be due to looting as it is located near to Spaulding Tract, which
had previous evidence of looting. People from the area mentioned that more groundstone was present at sites around the lake in the 1950s and much of the surface artifacts were collected over time by looters and collectors. Rock ring sites located in the middle of the western shore had more surface artifacts and groundstone.

Figure 5.19. Groundstone Site 05-06-58-390, Feature 10.

Faunal

Unfortunately, detailed analysis of faunal remains was beyond the scope of this thesis. Only one full bone was collected: a right coracoid of an Anatidae species such as duck, geese, and swan (Gilbert et al. 1996). The size suggests it was most likely from a duck. The majority of the other bones were burned, fragmentary, and unidentifiable. The other full bones were found at site 58-411 in feature 7, inside the scrape. The faunal
assemblage included 11 unidentifiable bone fragments, 8 unidentifiable long bones, 3 bird long bone fragments, 2 bird phalanges, and 1 distal bird humerus. Adam Gutierrez, who performed the faunal analysis, was surprised with the quantity of well-preserved bones coming out of the rock ring surface scrape units.

Figure 5.20. Site 05-06-58-390, Feature 2, Collected Bone.

**Bifaces, Edge Modified Flakes, Cores**

Only twelve bifaces and five edge modified flakes (EMF) were found from all of the sites investigated. This amount seems small since it is theorized that groups were traveling up to Eagle Lake to hunt, gather, and process as many resources as they could to take back to their respective winter villages. A possible reason for the small number of processing tools is that the sampling strategy focused mostly on the middle of rock ring features to locate hearths. The lack of processing tools suggests resources were processed closer to where they were obtained. The artifacts found within the rock ring features were used directly for their current food preparations. Another possibility is that placement of
surface scrapes hampered recovery of processing tools because inhabitants were consistently trying to keep a clean floor, so discarded tools were swept out the opening or along the rock ring walls. All bifaces found were broken and most were made out of basalt. All of the obsidian bifaces were broken and small. They were most likely tips or fragments of projectile points. Only one basalt and CCS biface fragment was collected.

Six cores were found during this project. Two of the cores were multi-direction and four were single direction. The lithic analysis suggests that obsidian was scarce for the inhabitants of the rock rings and was a prized tool stone for the manufacture of mostly projectile points. Basalt is abundant locally and was used for larger processing tools but rarely for projectile points. The lack of obsidian cores and bifaces could mean that groups traveled to Eagle Lake with pre-manufactured projectile points or point blanks, or they traded for obsidian from other groups that also came to the area.

**Spatial Analysis**

When preparing the site maps for this thesis, an ancient lake terrace was identified on orthographic aerial photographs. The lake terrace was digitized along the western shore of Eagle Lake using ArcGIS. The generated digitized lake level is in correlation with all of the rock rings investigated for this study (see Figure 6.11). The DLT shows an area that could have been part of a shallow estuary. A rock ring site was found along the ecological zones of this possible estuary. More research is needed to date this lake terrace and estuary, an action that could also help to date the rock ring sites along its edges.

None of the six sites investigated for this study occurred on the eastern side of the digitized lake terrace (DLT). When all rock rings are examined and compared to the line, many sites not investigated occur on the western side of the line. The majority of the sites
on the western side have 1-4 rock rings, while there are four sites with higher amounts of rock rings (6 to 11) on the eastern side of the digitized line. The location coordinates of two of the larger sites are projected a few meters into the lake. Eagle Lake has had periods of low lake levels because it is fed by only one main tributary. The lake has a correlative relationship between drought and low water levels. These sites were recorded in 1981, when the lake was at higher than normal levels (PHDI Data 2009). Currently the lake is severely low; it is fluctuating at an elevation of around 5080 feet. During fieldwork in the summer of 2011, the author walked the shore from Spaulding Track to Wildcat Point numerous times and no such sites or features were found along or around the modern shore. The only features that do occur within close proximity of the lake are hunting blinds of unknown ages. The sites that occur close to the shore or under the lake with many rock rings on the GIS forest heritage layer are likely spatially represented incorrectly. Not all sites on the district have been documented using GPS, so often the UTM defined from older methods are used to project the sites on the forest heritage layer. This has created many errors in the representation of many sites across the forest. However, when the sites are visited for monitoring purposes they always get an updated GPS shapefile.
Figure 5.21. Ancient and Modern Lake Levels Comparison.
Table 5.9. Ancient and Modern Lake Levels Distances from Sites.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>2009 Lake Level</th>
<th>Digitized Lake Terrace</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>05-06-58-411</td>
<td>338 m</td>
<td>77 m</td>
<td></td>
</tr>
<tr>
<td>05-05-58-382</td>
<td>390 m</td>
<td>87 m</td>
<td>Located next to point</td>
</tr>
<tr>
<td>05-06-58-365</td>
<td>397 m</td>
<td>85 m</td>
<td>Located next to point</td>
</tr>
<tr>
<td>05-06-58-364</td>
<td>567 m</td>
<td>349 m</td>
<td></td>
</tr>
<tr>
<td>05-06-58-345</td>
<td>395 m</td>
<td>140 m</td>
<td>Ring feature 21-- 58m</td>
</tr>
<tr>
<td>05-06-58-390</td>
<td>200 m</td>
<td>170 m</td>
<td>Wildcat Point</td>
</tr>
</tbody>
</table>

Figure 5.22. Ancient Lake Terrace and Site 05-06-58-345.

When the sites are examined in correlation with the digitized ancient lake terrace, it changes many of the dynamics and aspects of the sites. All of sites occur on high dirt and basalt fingers, as was noticed in the field, but when the data are examined in regard to the digitized lake level, it becomes clear that the sites were strategically placed on these high spots to be above the water line. In Figure 4.21, it can be seen that some of the rock rings at site 05-06-58-345 would have been approximately 50 meters from the ancient shore. This is drastically different from the modern measurements, with the
majority being almost 400 meters away. These higher lake levels would have shrunk the modern root crop bed areas along the western shore. However, it would have created many small estuaries that supported larger waterfowl populations, protected young fish, and provided other plant and animal species.

Fortunately, Pippen et al. (1979) looked at the formation of the lake sediments and gravels to date many ancient lake features. The lake formed around 35,000 years ago through faulting during the late Quaternary (Pippen et al. 1979:51). The first evidence of lake terraces occurs at 5140, 5150, and about 5160 ft above sea level (Pippen et al. 1979:51). Over time, lake levels seemed to level out and naturally fluctuate around 5125 feet. The lake level has had many fluctuation events; the first major recession was 1925 ± 100 B.P. when the lake dropped significantly below 5125 feet (Pippen et 1979:52.). After 1100 B.P. Eagle Lake dropped again. The 1100 B.P. date fits nicely with the medieval climatic anomaly (MCA) usually dated to 1100-600 B.P. (McGuire 2002:176.) The lake rose again around 500-400 B.P. to 5120 ft and stayed around this elevation until early settlers first entered the area. Even during the late 1970s, Pippen et al. (1979) noted that Eagle Lake was dropping, probably due to both water diversion from the Bly Tunnel and global climate change. In 1979, the lake level was recorded at 5108 feet.

The digitized lake terrace (DLT) created for this project runs approximately along a topographic elevation line, about 5118 feet above sea level. These data show that rock rings were strategically placed on the landside of the normal Eagle Lake water level around 5125 feet. This suggests that the sites that occur on the western side of the DLT are older than the sites on eastern side. The sites that do occur on the eastern site are most
likely associated with a drastically lower lake level due to a prolonged drought event such as the MCA. More research is needed to evaluate this hypothesis.

In addition to lake level information, archaeological evidence also suggests that some kind of environmental event occurred that forced local indigenous groups to change adaptive strategy. At the Pike’s Point site during this Later Occupation phase, there was an absence of Desert side-notched (DSN) projectile points, a very common diagnostic artifact for the Terminal prehistoric and historic periods in the larger region. The lack of DSN points led Pippen et al. (1979:144) to suggest that Pike’s Point was abandoned during the last 500 years. In addition, DeGeorgey’s (2006) investigations of 05-06-58-0345 only found three DSN points out of 25 diagnostic projectile points, and only three DSN points were found during this study out of a total of 13 diagnostic projectile points. These data suggest that something occurred during the Terminal/Later occupation period that forced groups to change their adaptive strategies and move to places other than Eagle Lake. The other possibility is that due to the dramatically low lake levels for 600 years, many of these Terminal/Later occupation period sites are now underwater. Another possibility is that the projectile point typologies do not account for projectile point regional preferences. According to McGuire (2006:175), “Numerous radiocarbon dates and obsidian hydration values from the Pit River uplands indicate that the use of the Rose Spring projectile point in some areas may have extended throughout the Terminal Prehistoric period—well past the 500 B.P. cutoff normally defined for the type.” All of the identified possibilities were out of the scope of this project, but they demand future research and could potentially reshape the knowledge of Northeastern California prehistory.
Tested Cultural Behaviors

One of the goals of this thesis was to compare ethnographic accounts with intra-site spatial relationships to identify potentially associated behaviors or cultural practices. According to Lightfoot (2009:279), “The primary social unit, the winter villages were organized into discrete house clusters, where related families established homes, cookhouses, storage facilities, and sweathouses.” In addition, these structures were clustered around the chief dwelling to provide an extra windbreak (Garth 1953:143). In particular, the sites were investigated to see if the rock rings had a statistically significant clustered layout.

A Multi-Distance Spatial Cluster Analysis (Ripley's K Function) test was performed on the data to see if the rock rings’ site layout shows a statistically significant clustering or dispersion layout over a range of distances.

Figure 5.23. Ripley K Function Results 05-06-58-411.
Site 58-411 shows a statistically significant clustered layout up to 35 meters as well as a statistically significant non-random dispersion of discrete cluster past 35. This means the rock rings were clustered in discrete groups across 35 meters and that the different clusters were non-randomly dispersed out across the site. These data suggests that the layout was strategically planned and fits with the previously mentioned ethnographic accounts.

Site 58-382 showed no statistically significant clustering or non-random dispersion; the rock rings at this site were randomly distributed across the landscape. These data along with the rock rings’ construction qualities imply that the rock rings at the site were constructed at different periods over time or that the site was only used for brief period.

**K Function 58-382**

![K Function Graph](image)

Figure 5.24. Ripley K Function Results 05-06-58-382.

Site 58-345 has a slight clustered layout between 5 to 20 meters but is not statistically significant. After 20 meters the rock ring are non-randomly dispersed but not in a statistically significant pattern.
Site 58-390 showed clustering from 2 to 26 meters and statistically significant clustering from 8 to 16 meters. There is no dispersion of the rock ring features between 2 to 26 meters.
The Ripley's K Function test is useful for identifying if features are clustered or dispersed over a distance. The test requires at least 30 features to result in meaningful outcomes. Unfortunately, none of the rock ring sites had more than 23 features. However, this test did a good job of showing if rock rings were clustered at sites such as 58-411 and 58-390, which had many features clustered together with common walls. Site 58-345 was more spread out but still had rock ring clusters in smaller groups.

Not only did this chapter support answering the research questions identified in (Chapter 1) by investigating rock ring construction attributes, projectile points, groundstone, faunal, formed tools, and spatial analysis to identify cultural behaviors, it also amassed a large amount of data that can be used for future studies. The following chapter will include the conclusions generated from the previous data.
Chapter 6
Research Conclusions and Recommendations

Conclusions on Functions

Many professionals archaeologist have concluded that a majority of the rock ring features across California, Oregon, Baja California, and Nevada are the remnants of habitation area anchors as well as storage or processing areas (Kolvet 2010:3; Davis 1975; Foster-Curly 1999; Johnson 1992; Ritter 1981). Most of these studies classify the features by size and associated artifacts, the large rock rings being associated with habitation and the smaller rings being associated with plant processing and storage. The data generated in the previous chapter support the conclusion that a majority of the rock rings along the western shore of Eagle Lake are the remnants of summer habitation areas matching the ethnographic description in the area (Garth 1953). According to Garth (1953:144), “Summer camps were little more than circular enclosures of brush, juniper limbs, or rock, ten or fifteen feet across with an opening on the east side. There was no roof, although branches and bark might be put over in rainy weather.”

The conclusions of the current study have resulted from analysis of the artifacts found from surface scrapes inside of the rock ring features at four of the six sites investigated. The artifacts recovered include an array of lithic material, groundstone, projectile points, and faunal remains.

One of the goals of this research was to test these rock rings against Garth’s (1953) assertions that the rock rings functioned as summer habitation areas and to determine whether any of the rock rings could have represented different functions. The rock rings at sites 05-06-58-365 and 58-05-06-364 likely functioned in a different
capacity than the rest of the rock ring sites investigated. This conclusion is based on the lack of associated artifacts and proximity to the modern lake levels. The only artifacts found at 05-06-58-365 were on the surface and included large, crude, basalt EMFs and one multi-faced groundstone artifact. In Chapter 4, function categories were identified as resource caches, dehydration palettes, living structure outlines, and hunting blinds. Due to many aspects of rock rings at site 05-06-58-365, this site can be placed into the dehydration palette category. This conclusion may be somewhat suspect due to the small sample size of only three rock rings at the site. When looking at the sizes of the three rock rings, two of the features fall into the most common size range of 2.1 to 3.5 meters, while the other feature measured 1.6 meters. Site 05-06-58-364 is most likely not a rock ring, since it is not similar in design to any of the other ring features for this study and only contained three flakes, all found on the surface.

In conclusion, this project found that the majority of the rock rings along the western shore of Eagle Lake functioned as habitation anchors. This is supported by the large amount of artifacts found that are indicative of habitation. In the function categories section (see Chapter 5), it is stated that hearths should be located inside or outside of the rock ring feature for cooking and warmth purposes. Only one possible fire hearth was located, at site 05-06-58-411, feature 6. This possible hearth was very ambiguous. The lack of hearths was perplexing since the surface scrapes’ placement was designed to locate these features. This suggests two possibilities: that the 1-3 cm deep surface scrapes did not penetrate far enough into the soil to where the hearths are located, or that the associated hearths were located outside of the rock rings.
Spatial Relationship Conclusions

The next goal of this project was to look for spatial relationships between sites based on evidence from ethnographic accounts, and in particular, to ascertain if the rock ring features occurred in discrete house clusters. Finally, the sites were compared to both the modern lake level and an ancient lake terrace to determine which lake level fits best with the site locations.

One aspect tested was the orientation of the ring opening. According to ethnographic accounts, the door faced east or south, opposite the direction the local winds blew (Garth 1953:144; Golomshtok 1922:7). The winds in the Eagle Lake area are fierce, generally blow out of the south-southwest, and can become very violent in the afternoon. The data from the previous chapter show that 22 of 61 or 36 percent of rock rings had no identifiable opening. Four of 61 or 6.6 percent of the rings had multiple opening orientations. Twenty-six or 42.7 percent of the rings had identifiable openings oriented between 0 and 135 degrees, which is opposite the local prevailing winds. Northwest is an opening orientation that would also afford protection from the wind and there were four or 6.6 percent of the total sample that faced in this direction. The remaining five opening orientations fall between 136 degrees and 315 degrees.

In conclusion, the majority of rock ring features that have identifiable opening orientations faced the opposite local winds. The fact that almost a quarter of the sample had no opening in the ring wall limited the significance of the outcome. However, it is theorized that rock rings without openings also functioned as habitation areas. To enter these ring features, inhabitants stepped over the low rock ring wall. This conclusion is
based on the associated artifacts that were indicative of habitation, which were found in both of the rock rings with different entry types.

The next spatial aspect examined was the layout of sites to see if rock rings were clustered as described in ethnographic accounts. Two of the four sites subjected to the Ripley K Function test produced statistically significant results. Sites 05-06-58-411 and 05-06-58-390 both had large complexes where ring features share multiple common walls. Site 05-06-58-0345 is a linear site with a slightly clustered layout, but the results were not significant. This layout was different from sites 05-06-58-411 and 05-06-58-390, where most of the rock rings were clustered into small groups along the large linear site. The natural windbreak of tree coverage could have directly affect site layout, leading to the observed difference. Site 05-06-58-345 has trees and lava flows that act as windbreaks, while 05-06-58-411 has no wind defense. It is possible the clustering of rings together was a purposeful way to lessen exposure to the wind. The data generated do support the ethnographic accounts that rock rings were grouped in discrete clusters. The discrete house clusters possibly represent different families, different construction periods, and/or a strategic method of mitigating environmental factors.

The next spatial research question is how the rock ring sites correlate with modern and ancient lake levels. All of the rock ring sites were almost 400 meters west of the modern lake level. These distances seemed relatively far to haul water back. When the sites are compared to a digitized lake terrace, the distances of three sites are reduced to under 100 meters and two under 200 meters. None of the sites occurred on the east side of the digitized lake level. This suggests that all of the sites that were investigated for the current study were constructed when the lake levels were around 5125 feet above sea...
level. These data, combined with projectile point type data, can help provide relative dates for the site.

In conclusion, spatial analysis (SA) was helpful in identifying different human behaviors from the spatial layout and construction aspects of the ring features. However, it also generated more possible research question than it answered. Using ArcGIS to run spatial tests on archaeological data is the future of SA and archaeology. This program has the potential to identify insightful pattern that could be missed by the human mind. It does have its limitations, however, as the user must have a substantial knowledge of the program and preferably a background in geography and statistics. Many of these tests require a set amount of data in order to produce statically significant outcomes. If these constraints are kept in mind when developing a research design, ArcGIS can help generate more substantial conclusions.

**Theoretical Framework Conclusions**

The previous chapters have shown that the rock ring sites and Eagle Lake fit nicely with cultural and ecological edge theory, discussed in Chapter 3. Eagle Lake shares many of the characteristics of an ecological edge outlined by Turner et al. (2003). Firstly, the lake is rich with different species of fish and attracts large and small terrestrial mammals and bird species. On the west side of the lake are the large conifer forests of the Sierras and to the east are the high deserts of the Great Basin. Both areas have different ecosystems and provide their own distinct resources.

The ethnographic record of this area also supports the idea of a cultural edge. Eagle Lake is a contested region, with Atsugewi, Northern Maidu, and the Northern Paiute all staking territorial claim to part of the area (Riddell 1978; Garth 1978; Fowler
and Lijeblad 1986). The three distinctive groups shared similar seasonal rounds, lived in similar habitation structures, and used similar hunting and gathering techniques. There are also ethnographic accounts that the Apwaruge, who are a band of the Atsugewi, established kinship connection through intermarriage with Itsatawi, Achomawi, Madesi, Northern Yana, Mountain Maidu, and other groups. The Atsugewi normally had good relationships with neighboring groups such as the Maidu, Achumawi, and Yana (Garth 1978:238). It is possible that these relationships formed during the spring and summer months when these groups traveled to Eagle Lake where they hunted, collected, and traded and shared tangible and intangible resources.

Artifacts and lithic analysis from this thesis have also provided evidence that the rock rings are part of a transhumance adaptive strategy and support the idea that the area likely functioned as a cultural edge. Unfortunately, the results from the obsidian sourcing and hydration test were not received in time to be included in the final draft of the thesis. This information would have likely provided concrete evidence that the area was a cultural edge with many different obsidian sources being represented in the sample. The project area does not have any obsidian sources in the Eagle Lake Basin. The Kelly Mountain obsidian source is relatively close to the project area at approximately 34 miles southwest of the project area. Kelly Mountain obsidian is phenocrystic, with many smaller crystals in embedded into the obsidian, which makes it easier to identify visually. None of the lithic material found for this project had aspects of Kelly Mountain obsidian. This means that since obsidian does not occur locally and the obsidian found was not from the Kelly Mountain source, obsidian came to the area through trade. The obsidian found for this project was high quality and most likely came from north of the Eagle Lake
Basin such as from sources located on the California/Oregon state border. This provides direct evidence that the Eagle Lake Basin was a cultural edge where groups met and exchanged tangible and intangible objects. Once the obsidian information is returned, this information will be written up and presented, since it is very interesting and important to this research.

**Temporal Periods Conclusions**

The next goal of this thesis was to place the rock rings into a California taxonomic/temporal sequence. To provide relative dates, diagnostic projectile points were examined in correlation with previous temporal sequences developed by Pippen et al. (1978), McGuire (2002), Delacorte (1997), and other investigations identified in Chapter 2. The projectile points collected and examined for this thesis were found within the top 1-3 cm of the soil, skewing the data towards the end of the occupation period. According to DeGeorgey (2006:135), “Younger projectile point forms associated with use of bow and arrow technology (Desert side notched, Cottonwood, Gunther barb, and Rosegate), were recovered from surface or near surface contents (less than 40 centimeters depth).” Older projectile point types, associated with atlatl use, were often recovered at depths of 20-70 centimeters (DeGeorgey 2006:135). Therefore, the points found for this project do not represent the full spectrum of human occupation of the rock rings and the region.

Evidence from this thesis and previous research suggests rock rings first appeared during the latter part of the Middle Archaic period (3500-1300 B.P.). These features were likely developed in conjunction with new hunting and gathering techniques such as the advent of bow and arrow technology, a two-settlement strategy (upland migration), and an economy driven by intensification of lower ranked resources such as geophytes.
(McGuire 2002:172; Justice 2002:231; Fosters-Curley 1999). The rock rings were used most intensively during the Late Archaic period (1300-600 B.P.), because most previous rock ring investigations date to this period. In addition, the high frequency of Rose Spring projectile points (1500 to 700 B.P.) found during this research and in many investigations supports a Late Archaic period use history (Kolvet 2010; DeGeorgey 2006:57; Friedman 1997:28). During the Terminal Prehistoric period, evidence suggests that rock rings were not being used with the same intensity as in the previous period. Data from both this thesis and other research support this claim with a drastic lack of Desert side-notch projectile points, the hallmark projectile point type of this period (DeGeorgey 2006:57; Friedman 1997:28, Pippen et al. 1979:144). The effects of the MCA are likely the cause of this change of use; however, there is very little direct evidence to support this claim except the lack of DSN. There is also evidence such as a hearth located inside a rock ring feature at site CA-LAS-345 showed the rock rings were still being used around 300 +/- 60 B.P. $^{14}$C B.P. (DeGeorgey 2006:90-91). Also, there are historic accounts of rock rings being used in 1857 by a group of Achomawi attempting to hide from US soldiers. Rock rings were still being used after the MCA and up to Contact but likely not in the same capacity as in the Late Archaic Period (1300-600 B.P.).
<table>
<thead>
<tr>
<th>Date</th>
<th>Feature/Artifact</th>
<th>Citation</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Pikes Point Phase</td>
<td>Rose Spring &amp; Gunther Barbed</td>
<td>Pippen et al. (1979:146)</td>
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<td>2,000-1000 B.P.</td>
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<td>Later Occupation</td>
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<td>Pippen et al. (1979:144)</td>
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<td>Period</td>
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<td>Fosters-Curly (1999)</td>
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Table 6.1. Dates From Research and Previous Research.
Conclusion on Feature Designs

The last research question looked at design qualities of rock rings to determine if there was more than one type of rock ring construction. This research found there are at least three distinct rock ring types located in the project area. The first distinctive design was the general rock ring, 1-2 courses high constructed out of angular vesicular basalt. This type of rock ring was found at five of the six sites and was the most abundant of all types (Figure 4.5). This type of ring contained evidence of habitation. The next type observed consisted of rings with towering vertical walls. These rings were only observed at site 05-06-58-411 and the previously investigated site CA-LAS-345. Their walls are often very well constructed out of medium size tabular vesicular basalt and are 3 to 4 courses with wall heights above 50 centimeters (Figure 4.1). The last distinctive type of ring has an average wall height of 1-2 courses and an outward expansion and accumulation of rock around the wall, likely acting as a retaining wall (Figure 4.6). These features were only found at site 05-06-58-390. The rocks that construct these walls are between large cobbles and small boulders in size. These features also had artifacts indicative of habitation.

The different distinctive rock ring types are likely the outcome of site layout, environment, and natural forces. Site 05-06-58-411, with its towering rock ring walls, was exposed to the prevailing winds and direct sun contact. These features were likely designed to lessen natural forces with their larger vertical walls. The rock rings at site 05-06-58-390 were at the bottom of a large north-south lava flow. Many of the rings walls were constructed using the lava flow as part of the feature wall. This different type was produced by clearing the surface around the lava, which was likely littered with excess
rock. The excess rock needed to go somewhere, so it was placed around the wall, making it thicker. The general rock ring was most likely the easiest style to construct, assuming that the environmental conditions already provided a natural windbreak and some shade.

**Summary**

In summary, rock rings features show intervals of use spanning 2000-1500 years and are still being used today as modern waterfowl hunting blinds. The associated artifacts found for this investigation led to the conclusion that the majority of the rock rings along the western shore of Eagle Lake functioned according to Garth’s (1953) description of anchors for summer habitation superstructures. The lithic and artifact analysis also suggests that inhabitants were hunting, gathering, and processing an array of plant and animal resources. These two activities fit nicely with the theory that these rock rings are part of a seasonal upland migration adaptive strategy. The objective of an upland migration adaptive strategy is to travel to the uplands from a lower elevation, to hunt, gather, process, and store as many resources as possible to take back to the winter village. Eagles Lake’s relatively high elevation of 5100 feet ABS and the current lack of evidence for winter habitation structures and villages in previous investigation and this thesis supports the theory that the Eagle Lake region was seasonally used.

The list and discussion of edible resources found in Chapter 2 sets up the foundation for ecological and cultural edge theory and how it fits the environmental condition of Eagle Lake by showing how the region has an abundant seasonal rich biodiversity with many different environments overlapping in the general vicinity. The discussion in Chapter 3 of the linked cultural edge was further supported by the ethnographic accounts that the area is a contested region with Atsugewi, Northern Maidu,
and the Northern Paiute all claiming a portion of the region. All of these distinctive tribes share similar seasonal rounds and habitation structures that are likely a result from shared knowledge and cultural exchange (Turner 2006).

Another goal of this thesis was to use previous investigations to place the rock rings into a larger regional perspective. One theme that was identified by Fosters-Curly (1999) was that rock ring features in the Hat Creek upland were part of an adaptive shift around 1300 years B.P. to a more permanent life way when intensification and storage of roots crops became vital (Fosters-Curley 1999). Since Eagle Lake Basin does not have any oak trees, ethnographic accounts and evidence from this thesis groundstone analysis suggest that the inhabitants relied heavily on root crop intensification (Garth 1953:138). This investigation found a majority of the points typing to Rose Spring, which dates to 1500-700 B.P., and which also supports Foster-Curley’s (1999) assertions that there was an adaptive strategy shift around 1300 B.P. (Justice 2002). The evidence from this thesis does support Foster-Curley’s assertions but to definitively conclude that the adaptive shift in the Eagle Lake Basin was caused by the intensification of geophytes is a stretch, since there is also abundance of other resources such as fish, birds, mammals, and an array of plant resources that are just as important.

**Thesis Importance**

The rock rings sites at Eagle Lake and other regions are important and deserve preservation because not only are they visually significant but they also have the potential to provide information about prehistory for at least the last 1500 years. The rock rings at Eagle Lake have concentrated human occupation into a 3 m circular area. With the right research question, the knowledge that can be gained from these features can help develop
regional specific typologies, provide more understanding of human adaptive strategies, provide information on Later Archaic and Terminal Prehistoric diets, and help reconstruct the effect of prehistoric environmental events such as the MCA.

**Recommendations for Future Studies**

Future rock ring research at Eagle Lake should focus on oral histories from interested parties at the Pit River Tribes, Susanville Indian Rancherias, and other interested groups. Other important avenues of research should focus on absolute dating, the ratio between Desert side notch and other projectile point types, geoarchaeological investigation on the formation of the lake, and how the region and the lake were affected by the MCA. Between these, there are at least a couple theses’ worth of work. The oral histories are the most pressing issue because ethnographic work has not been done since the late 1970s and important knowledge could be lost.

Another potential avenue for future work is to investigate if rock rings and house depressions serve the same general purpose as habitation areas. It is likely that the difference is the material and the soil they are constructed into: if the soil is rocky and mostly impenetrable, the frame of the structure sits on the surface with circular rock walls anchoring it to the surface. If the soil is loose, the frame of the structure can be anchored into the soil.

Site 05-06-58-329 should be the next rock ring site investigated. The site is located on a basalt bluff overlooking Pine Creek, between Little Harvey Valley and Logan Springs. This site has ten defined rock rings, two rock alignments, and bedrock mortars. Artifacts at the site included an obsidian Rose Spring corner-notched projectile point, an obsidian biface, a mano, and a possible pestle (Helbert et al. 1980). Some of the
rock rings located at this site do not conform to a circular design but are more oval or oblong in shape. This site is important to further the understanding of rock rings in the Northeastern California because the ring features are very well defined and have large wall heights. It would also be interesting to compare the data from the rock rings along Eagle Lake with the rock rings from 05-06-58-329 to see if they are similar in size and layout, and if the inhabitants were participating in similar or different activities.

In addition to exploring oral histories, other identified sites, and rock rings vs. house pits, some of these rock ring features in the Eagle Lake Basin should be excavated to add support to or disprove the assertions of this thesis and to answer other future research questions. Because the rock rings were only investigated with surface scrapes for this thesis, the information about human occupation is limited, but sufficient to answer the research questions of this study. This thesis should be viewed as the take-off point for more specific research questions.

**Looting and Management Recommendations**

All of the sites had evidence of looting in the form of looter piles from surface collection. The closure of the Osprey Management Area affords protection for these sites because it drastically reduces foot and vehicle traffic. The closure also provides protection for people and groups who are willing to walk a distance to look for artifacts without being caught. The current problem is not out of control, but the Forest Service needs to take more steps in educating the public on the ramifications of looting on archaeological sites. Signs would be important for deterring people. Law enforcement cannot be the only tool used to prevent looting, because such departments are understaffed, have other obligations, and are not going to regularly access this project.
area. That leaves the problem on the shoulders of archaeologists, who can use education as a way to prevent the loss and destruction of this important national heritage. In addition to the recommendations made previously, a site stewardship program should be developed between the US Forest Service, Susanville Indian Rancheria (SIR), and interested local parties to add protection these sites. By getting the public involved, particularly those who have an emotional link to the area, the sites will be afforded with more protection because people who frequent the area will provide more eyes on the sites. This partnership will show to the groups identified why these sites are important and what the Forest Service is willing to do to preserve these sites.
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