A Trail through Time: Hopland to Lakeport on an "Old Indian Trail"

by
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Abstract

Purpose of the Study:

The purpose of this study is to generate a context for describing the use and reuse of a trail through the Mayacmas Mountains, historically described as the "Trail between Hopland and Lakeport", and also having its origins as an "Indian Trail". This study area for this project is the Hopland Research and Extension Center (HREC), because the trail is thought to pass through the HREC property. The study of this trail also has the potential to contribute to ongoing regional archaeological studies in the southern North Coast Ranges and highlight areas of potential interest for future research.

Methods:

The study used archaeological, ethnographic, historic, geographic data and local knowledge to identify the route of this trail. Sections of the hypothesized route were surveyed, mapped within a GIS, and evaluated using ANOVA and T-Test to determine if there was statistical probability of a relationship between the trail segments and a set of archaeological sites, as compared to a set of randomly generated points.

Findings:

The "Trail from Hopland to Lakeport" is historically documented as passing through Benmore Valley and turning west towards Hopland. There are three routes across the HREC, each of which has multiple lines of evidence supporting its use in historic times. From the statistical test results I have concluded that there is a probability of a relationship between segments of two routes and archaeological sites. More importantly, the relationship is strong for four segments, representing all three routes, and prehistoric sites. However, there is insufficient temporal data for the study area prehistoric sites to assign a more specific age to the trail.

Trails often branch and bifurcate with changing needs and destinations. The northernmost trail segment was appropriated as a Settler's Road, but there is evidence that all three routes were in simultaneous or near-simultaneous use until the early 20th century.

Conclusions

The results of this study show that historical, ethnographic and local knowledge can be combined to successfully locate ephemeral features such as trails in a changing landscape. Although this information has a shallow time depth, it sets the stage by providing a starting point and framework for future investigations in the study area.

Chair:_____
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MA Program, Cultural Resources Management Date :_____

Acknowledgements

Alex DeGeorgey told me that it "takes a village" to complete a thesis. I would like to express my thanks and gratitude to the following people and institutions for being in my village.

To my thesis committee members: Margaret Purser, Matthew Clark and Donna Gillette, for their time, encouragement, and constructive criticism, thank you.

The people of the Hopland Research Extension Center, past and present, shared their stories, escorted me throughout the property and answered my questions when I needed help. John Poor, Chuck Vaughn, Robert Keiffer, Steven Poor, Shane Feirer, thanks so much for everything.

Thank you to Shawn Pady of the Hopland Band of Pomo Indians. I hope there will be more opportunities to expand the story that is told only in part in this thesis.

I also want to extend my thanks to some local archaeologists who answered my questions and piqued my curiosity about the Mayacmas Mountains. Dr. John Parker, who first mentioned the trail across the Mayacmas and through Benmore Valley to me, and Alex DeGeorgey, Kate Erickson, Kat Kubal, Chris Lloyd, and Mike Newland.

Many institutions and libraries were very helpful in my quest: Sonoma State University especially the staff of the Departments of Anthropology, Geography and Global Studies and the Jean and Charles Schulz Information Center, The Grace Hudson Museum in Ukiah, The Lakeport Historic Courthouse Museum, the Held-Poage Memorial Home and Research Library, The County of Mendocino Assessor's Office and County Surveyor's Office and last, but not least, the staff of the Northwest Information Center in Rohnert Park.

To all my past instructors, the Cabrillo College Archaeology Technology Program, Rob Edwards, Charr Simpson-Smith, my friends and family for their encouragement and support: my father, who said I could do anything, Susan, who got me into this, Jan, for her editing, and Mark, for putting up with me. Thank you!

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Chapter 1: Introduction - A Trail Through Time

The northern Mayacmas Mountains are a rugged range within the greater North Coast Ranges. Relatively few modern roads traverse them. Yet they sit in the heart of the traditional territory of the Pomoan peoples, who claimed a region from the Pacific Coast to the Russian River, and the shores of Clear Lake. The Pomo and their neighbors had a trail network that allowed communication and trade between them. There is ample evidence throughout the central North Coast Ranges for the distribution of obsidian from the Clear Lake and Napa Valley areas, and clamshell from the coast. If the Pomo had reasons to travel such long distances, where are their trails? Several recent researchers have provided evidence of trails in Central Pomo territory, or, from one group to the other over the Mayacmas (DeGeorgey and Mongeau 2005; DeGeorgey et al. 2011; Kubal 2010; Lloyd 2009; Newland and Much 2008; Parker 1975). Both L.L. Sample (1950) and James Davis (1974 [1961]) developed a synthesis of trade in California, and provided general information about known trails.

The question of trails is significant for the Clear Lake/Mayacmas Mountains region because researchers now understand that in prehistoric times, multiple groups employing different technologies and subsistence styles were present in the Clear Lake Basin at the same time. Ethnographic and oral history suggest that the Pomoan groups traveled to procure resources, trade and other social activities. A cultural resources study at Anderson Flat, just south of Clear Lake, confirmed the use of this area for about 7000 years, in continuous use by residents of the basin, but also by seasonal visitors (White et

al. 2002). Some linguists and archaeologists have postulated migration of the Pomoan people from a homeland on Clear Lake to the Russian River Valley at about 2500 years before the present as described by Mark Basgall (1982) and Victor Golla (2007). What can we learn through spatial analysis and a landscape approach to the study area that might highlight the movement of people between Clear Lake and the Russian River?

This project proposed to use a University of California facility, the Hopland Research and Extension Center (HREC) as a cultural landscape study area to investigate this question. The study area is small, 5,358 acres, but it encompasses a diversity of resources and sites that may have had significance to prehistoric people from the earliest occupation of this area. The Hopland to Lakeport Trail has also been tentatively located crossing the northern part of the HREC.

Analysis by local and regional landscape scale is particularly important when studying linear features such as a trail, because trails by definition exceed the usual boundaries of site and may extend for great distances. A trail represents focused movement in space and time, but it is not only a means to get from one place to another. Trails can also be mnemonic devices incorporating cultural memory, facilitate resource procurement, social activities and spiritual quests (Earle 2009). Over time, use and meaning of the trail may change, but old meanings may be recognizable within today's landscape. The complexity of trail studies requires a landscape approach that spans the gap between prehistory and history, and considers the context of a "landscape of movement" (Bender 2006; Snead et al. 2009).

The modeling of spatial relationships in a GIS between resources has been instrumental in highlighting poorly understood economic and cultural aspects of prehistoric life (Boaz and Uleberg 2000; Harris 2000). The use of GIS is appropriate in a landscape study because of its ability to combine discrete data from diverse sources for regional pattern analysis. A spatial study that examines sites and features within the Mayacmas Mountains from the western shore of Clear Lake to the Russian River has the potential to uncover new ideas about the relationship of human occupation and movement between Clear Lake and the Russian River Valley.

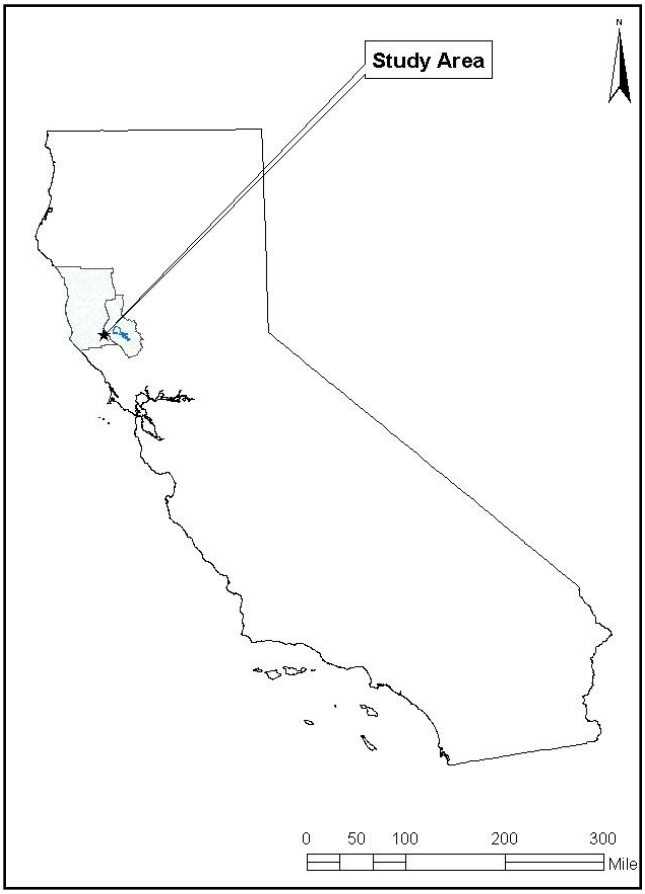

Figure 1: Map of California showing the location of the study area.

Thesis Organization and Questions

I have organized this thesis in the following manner. First, I will present some reasons for studying trails and the theoretical approach to the "landscape of movement". I will describe the study area as a natural landscape and then talk about the North Bay/North Coast cultural chronology, leading up to a cultural history of the region from prehistory to the present. Finally, I will describe the methods I used to investigate the study area and wrap up with my findings and conclusions. I will be trying to answer the following questions:

- *Is it possible to locate portions of the trail? If so, do any parts still maintain the character of a prehistoric foot trail?*
- *What can we learn through the spatial analysis of sites in the study area and historical accounts that might highlight the movement of people between Clear Lake and the Russian River?*
- *Is there a reasonable argument for inferring a relationship between sites on the HREC and the trail?*
- *How has historic travel modified or changed the purpose of the trail?*
- *Is there still knowledge of the trail within the local Native American community and among area ranching families?*
- *If portions of the trail retain their prehistoric characteristics, how can the HREC protect the trail segments as cultural resources?*

Chapter 2: Why look for a trail?

What is a trail? It is the result of people moving about from place to place, or task to task, and reusing the same route each time. Eventually, if the route is useful, it is reused until there is a clear marking on the land where one should walk. There has been a useful attempt at route typology by some researchers (Earle 2009, 1991; Hyslop 1991). John Hyslop saw routes as falling on some continuum between a clearly constructed form and a vernacular, unconstructed form. The "formal" type was defined as constructed with features like curbs and pavements, in other words, roads. Hyslop defined a "path" as "any surface indication that people traversed a given route, but that labor was not invested in building its course" (1991:29). In 1991, Hyslop did not want to construct a typology of "paths" and roads because there was still a lack of information about construction techniques for roads in the Americas, and overlap between how roads and path routes are marked (Hyslop 1991:29).

Timothy Earle (1991, 2009) was interested in the relationship of sociopolitical aspects of routes, whether "path" (1991) or trail or road, or somewhere in between. His working typology distinguished between paths, trails and roads (2009:255-258). Paths and trails appear in societies at all levels of sociopolitical complexity, but the planning and engineering of roads tends to be present in chiefdoms and states. Using Timothy Earle's (2009) definition, the subject of this thesis is a trail. It is not a path, in the sense of a daily task-oriented record of movement, but a regional route that had the potential for

several uses, including individually sacred and spiritual tasks, economic (resource procurement and trade) and also the larger society's social activities.

Trail researchers have commented on several important meanings for trails. Many agree that it is a social space of importance to people, to whom it belongs, allowing for social relations with other groups, binding distant groups (and places) together (O'Hanlon and Frankland 2003; Hassig 1991; Snead 2002, 2008). Tim Ingold saw routes and places as inseparable. If you have people and places, you must have routes (1993:167). Ken Basso noticed that for the Western Apache, culture was remembered in places. Speaking the name of the place was to speak the words of the ancestors (Basso 1996a:10). Because all societies have developed trails and roads to some degree or another (Earle 2009), their routes are appropriate subjects of study that may help us understand how cultures are organized, how they evolve, and how the people of that culture interact with and know their world.

Researching a trail is not like researching the traditional site. Although there is some overlap between trail and site, there are characteristics that set trails apart. First, there is the matter of scale. Trails are linear, and usually narrow. They may be reused or repurposed to other modes of travel. They can run on for tens, if not hundreds of miles, crossing multiple property and political boundaries, making them difficult to study with traditional site-based methods.

A trail route may not be intuitive to the modern person. Topography and intended use affect the route. Difficult terrain might cause traffic to be funneled into a specific area where travel was possible (Earle 2009). It has been noted that most trails and roads in the Americas are clearly meant for foot traffic since the wheel, cart and horse were post Columbian additions (Hirth 1991). Most trails are quite narrow, even for boots (Snead 2008:120), and the gradient may be steep as a tradeoff for shorter distance (Earle 2009; Gorenflow and Bell 1991; Hassig 1991).

Trail routes may be marked with visual markers such as blazes, stakes, cairns, petroglyphs, or their routes may be memorized through song (Ferguson et al. 2009; Hyslop 1991; Klasky 2009). Markings are often necessary because trails are not used daily, or by the same people who made them. Minor maintenance may be necessary to keep them open, although some of that maintenance may be through the use of the trail by migrating animals.

Trails also have the characteristics of impermanence and discontinuity. Once trails are no longer used, geomorphic processes become the dominant force shaping them. Preservation depends heavily on subsequent land use, the soil and the underlying rock type. This combination of features might lead to excellent preservation, as in the trails of the Pajarito Plateau of New Mexico (Hyslop 1991; Snead 2008, 2009), or, as more often happens, good preservation in some areas and poor preservation in others. When I asked several northern California archaeologists about trails and their visibility in the Mayacmas Mountains, several agreed that there was probably a trail in the area where I

was looking, but it was likely to be invisible due to disuse and weathering, and I could not possibly trace it entirely. It might look like a v-shaped swale in a meadow, or there might be rock cairns or campsites, but not to count on finding anything resembling a foot trail. The most likely place for a trail would be from one major village to another, a day's walk apart, or about six to eight miles. The trail was likely to be high in the topography, like on a ridgetop, might follow a boundary or be a boundary between tribelets. I was advised to read the ethnographies and ethnogeographies of the Pomo and neighboring tribes, where I would find what little information there was on trails and their likely locations. I was wished good luck in my search.

Trails can be converted to some other use or be appropriated by a subsequent culture. In California, Indian trails were reused by the Spanish and Mexican colonists. Later, some routes were paved and became highways (Davis 1974[1961]:4-5). The trail which is the subject of this thesis began its historic life as an Indian trail used by the McKee expedition in 1851 (Gibbs 1972[1852]; Mauldin 1951:1533-1534), and became the pack route for mail from Hopland to Lakeport. This route was still in use "as of 1872" (Mauldin 1956:6747). It was bypassed as a regional route when Col. Fred Long had a toll road surveyed and built in 1890. The toll road was in turn given a new existence as County Route 16 and is now known as State Highway 175 (Mauldin 1956:6748). Related to appropriation and reuse, is the concept of multiuse. The same route can transport people and goods for social and economic reasons or be used by a war party, or by groups and individuals on a ritual journey or spiritual quest (Earle 1991, 2009; Ferguson et al. 2009; Hassig 1991; Snead et al. 2009: Appendix 2).

Another characteristic of trails is the difficulty of placing them in time. James Snead and colleagues (2009), said trails were not only ephemeral, but palimpsests of reuse, appropriation, and reconstruction, and this made trails difficult to directly date. Sometimes, a village would move, meaning the trail would develop changes or acquire spur trails leading to the new site. The most successful dating method involves having features or sites with temporal data along the way that can be directly related to the trail. Building techniques in some areas may have not changed much but remodeling can obscure evidence of greater age (Hyslop 1991:32).

Fortunately, people do move about in their daily life or on specific tasks, and trails tend to become a visible part of the landscape. Advances in aerial photography in Great Britain in the early part of the 20th century made it possible to photograph large areas from an airplane and then scan the photograph for linear patterns (Crawford 1923; Trombold 1991). Aerial photography and remote sensing were also extremely important when relocating the roads of the Chaco Canyon area (Kantner 2004; Obenauf 1991; Sever and Wagner 1991). In the late 20th century, a laser-based technique called Light Detecting and Ranging (LiDAR), and the use space-based remote sensing platforms have made it possible for archaeologists to look at the landscape using visible and non-visible parts of the electromagnetic spectrum to detect patterns on the land (Daly and Lock 2004; Ur 2009). No doubt, future advances in technology will provide us with additional tools to assist in the search for trails.

Chapter 3: Landscape Archaeology

Landscape archaeology is a holistic approach to studying the natural and cultural elements of space and time. Landscapes have been defined as being in flux, constructed consciously or unconsciously, and maintained, erased, reused or imagined. Landscapes are overlapping or nested, but not necessarily visual. They are remembered and lived in, having the aspect of time (Anschuetz et al. 2001; Bender 2006; Ingold 1993; Knapp and Ashmore 1999; Tilley 2006). Landscape studies provide a "way of seeing" (Berger 1972; Green 1995:41), to investigate how people may perceive their world. It allows the scale of study to vary. This is advantageous, because scale has been a problem for archaeologists who are concerned with avoiding "site bias" (Knapp and Ashmore 1999:2; Sabloff and Ashmore 2001:22l). The site is the smallest unit of archaeological activity (Crumley 1999:220) in space and time, but it is an artificial construct of the archaeologist. None of this may mean much to the dwellers in the landscape. Time goes on. Time does not break for changes of meaning or ownership, except artificially, in the narratives we create when we lack sufficient temporal data, or have incomplete data due to artificial boundaries of history and prehistory. Our individual biases and how we are taught affects the interpretation what we encounter. Landscapes can confound traditional schemes of documentation (Snead 2002:752).

Like some geographers, whom Denis Cosgrove (1985) takes to task for adopting ideas without considering their origins, we must consider landscape and its background. The original concept of landscape was probably born in the Italian Renaissance, a time when what is currently described as arts and sciences were not unrelated studies, but part

of a whole fabric of knowledge. This was the start of what we know today as Western culture and science. Our Western consciousness of self began out of the separation of human from nature. There was a desire for certainty, to measure, modify and control the natural world. Geometry and survey translated into maps, a visual image of the world that could define ownership, borders, and control the meaning of the space (Smith 2003). Geometry also translated into the linear perspective, manifested in the art of the Renaissance, where we see the precision of perspective in the paintings of such masters as Leonardo, Titian and Bruegel (Bender 2006; Cosgrove 1985).

The rediscovery of linear perspective allowed the artist to position the observer outside of the image. The viewer was no longer a bystander. The representation assured that everything was in its proper geometric relationship, precisely translating a three-dimensional world onto a two-dimensional canvas or map. Thus, the viewer had the sensation of controlling the depicted space instead of being part of it.

Landscape, the term, has been attributed to a school of painting that originated with the Dutch, in which the subject was the countryside. In the sixteenth through the nineteenth centuries, the term “landscape” evolved from defining an artistic style to describing the subject of the painting, not just the painting itself (Green 1995; Olwig 1993). Like a painting of a portrait or event with a stylized foreground and background, landscape artists reconstructed the land itself for wealthy patrons, who wanted their own idealized, “esthetically improved” natural world, with perspectives, viewpoints and prospects (Bender 2006; Cosgrove 1985).

Constructed landscape is a symbol. It conveys information about our identity as a people or as individuals, or what we want others to know about us, and the message can be tailored to the audience. Cultural markings on rock could have served the same purpose to the prehistoric people of Atlantic Europe, (Bradley 2002) or to travelers on an ancient trail of the southwest (Snead 2009). An insider's knowledge is necessary for us deconstruct and interpret meaning which may not be apparent today (Winer 1995).

The concept of a "landscape" as scenery colored the impressions and expectations of British citizens, who took the concept of the "Picturesque", or "picture-like", with them on the Grand Tour, and to the lands they colonized (Hirsch 1995). Margot Winer (1995) and Lisa Kealhofer (1999) describe how colonists were "sold" on the idea of emigration to the Eastern Cape of South Africa in the 1800s and Tidewater Virginia in the 1600s, through the use of evocative Biblical imagery familiar to the British public (the Garden of Eden). This colorful but misleading cartography and other techniques such as landscape painting, travel writings and cartoons were used with great effect.

In mid 19th century France, as well, social trends and modernized travel and entertainment contributed to the demand for landscape experiences among city dwellers primed by the "proliferation" of landscape depictions (Green 1995:34). Country homes and leisure activities such as tourism were marketed as a healthful and desirable social experience for those who could afford it (Green 1995).

The idea of a cultural landscape opened up possibilities for archaeologists to study ancient peoples by looking at patterns of land use. The first use of landscape as a research method may have been the study of the Virú Valley in north-coastal Peru by Gordon R. Willey in 1953. Influenced by Julian Steward, Willey's interdisciplinary research method, now described as settlement archaeology, mapped ancient settlement patterns using aerial photographs and survey. The resulting maps were able to show which sites were occupied at a specific time. (Sabloff and Ashmore 2001:15-16; Trigger 2006:375-376).

After the settlement archaeology and quantitative processual archaeology of the 1960s and 1970s, serial waves of archaeological thought embraced individual and alternative viewpoints, and also made use of qualitative information contained in experience, memory, social life and "sense of place" (Feld and Basso 1996). There was a paradigm shift when too much of what was studied, or should have been studied, failed to fit into the positivistic archaeological explanations of the time.

In particular, what does one do with all the archaeological data that existed between the sites? What did or does the place of study mean to those inhabiting it? Present people do not think alike, react to, or experience their world in lockstep with each other today, so why should anyone think that life experiences in the past were uniform? As A. Bernard Knapp and Wendy Ashmore (1999:2) wrote, when taking the landscape approach, "…a holistic landscape perspective compels us to stress the *interrelationship* among people and such traces, places, and features in space and through time."

Taking stock of the visual and the remaining spatial patterns of landscape is important, but some introspective thoughts about "viewpoints" need to be stated. As described earlier, the modern Western concept of landscape is visual. The terms of the visual have migrated into other aspects of Western lives, where we consider our "prospects", or "take the long view" when considering future actions, consider "other viewpoints", and we say, "I see" to say we understand a concept. We have become comfortable with the use of the map in our daily lives, from "you are here" in the shopping mall to the park maps handed out at National and State Park visitor centers, where, incidentally, we go to view the natural world. Modern automobiles contain built-in GPS units to help us navigate the unfamiliar landscape, and surveyed land boundaries are required for the legal definitions of lots on which our homes sit. The world has been mapped and defined by Sanborn Company maps, Rand McNally, Google, and the county tax assessor.

Alternatively, what was visible from where the cairn was piled in prehistoric times, or the rock pecked and scratched? Did anything have to be "in view"? Was the scale of view more intimate? On the other hand, was there a narrative that went with this place, rooted in some past time or an aspect of culture? Landscape visible, mapped and controlled is not the only way to understand a world. The debate about landscape archaeology contains critiques of the visual (Green 1995), or the lack thereof (Cosgrove 1985), but visualization is a useful tool and vision is one of the primary ways that people interact and understand their surroundings. However, our experience of place and landscape is personal.

As individuals, we experience landscape in our own way. We are born into a place and a culture, and learn by observing and listening to others. We copy at first, but because we also are not unchanging. We reason, wonder, and experience our world. We are active beings changing the landscape and our own lives and culture. We experience our surroundings as individuals; even as we are experiencing enculturation, we are interpreting. Our experience is modified by the passage of time, our past experiences: the culture we grow up in, our age, our social status and our gender (Bender 2006; Ingold 1993).

Landscape is both an approach to engaging with our environment and a way of understanding a culture. There is a sense of duality – nature and culture - but as Paul Taçon (2002:122) reminds us, there is no place on earth where people have not lived, and so, no wilderness in the sense of the untouched natural world. We accept that humans have lived in North America for well over 12,000 years, that much of what European explorers found when they reached the Americas was the result of human modification of the natural world (Denevan 1992), and there is evidence for the presence of people near Clear Lake during the Paleoindian period 8,000 to 12,000 years ago (Fredrickson 1974, 1984; White et al. 2002:523-24). For all these thousands of years, after the arrival of humans in the Americas, humans have been altering, changing and being changed by their surroundings.

Human culture develops continuity through myth and a sense of history. People live in a world they did not create. They, in turn, modify what they live in, and leave it for their descendants. Cultural origins and the acts of the ancestors can be passed down generation to generation, and eventually into myth maintained by ritual actions, so that descendants will know who they are, how to live and how to be human. Ritual, remembering, and returning to significant places in the landscape are ways in which a people can reconnect with ancestors and their deep history (Crumley 1999; Gosden and Lock 1998; Knapp and Ashmore 1999; Theodoratus and LaPena 1994).

To study landscape is to study the interaction of the natural and cultural, blending the two. People move about in the world they perceive and if their movements continue in the same place long enough, a marking or "inscription" depicting the movement may develop (Ingold 1993; Snead et al. 2009). The creation of this marking may occur as part of the activity of daily life, without conscious intent. Local trails and pathways become familiar parts of daily and seasonal habits and practices and those trails become ingrained into the unconscious mind (Bordieu 1977). When we speak about trails as cultural markings in the land, we are talking about a landscape of movement (Snead et al. 2009).

Trails and paths develop a biography, or a history through use, of all the events and significant features along the way. They form a cultural entity, a landscape containing both natural and cultural features (Earle 2009; Knapp and Ashmore 1999). Trails are a pathway into culture and into memory. The trail, as a feature of the landscape, has been described as a mnemonic device for incorporating and teaching

culture (Basso 1996b). It contains the memory of the culture or a way of creating a shared social memory (Van Dyke 2003), or a message to potential visitors (Snead 2008). Those that know the stories pass on the knowledge to others, who thereafter may never be able to pass by without remembering.

With use, trails become more than just a pathway from one place to another. They become an entity in their own right, more than a site and less than territory. Trails can have more than one meaning at a time, depending upon the use to which they are put. The same trail could be walked for spiritual purposes or to travel to the next village (Ferguson et al. 2009). Trails link villages, shrines and sacred sites, seasonal camps and a network of other trails; joining a people to their neighbors and to landscapes beyond (Bender 2006; Ferguson et al. 2009; Howey 2007; Snead et al. 2009: Appendix 2).

Like people, and landscapes in general, trails are not static entities. Humans live in the land and change it, and it changes them. Over time, the purpose and the destination of a trail may change. Others who come after may find the trail useful, or change the destination, add side routes, or repurpose the trail, widen it for wagons, or survey it for an interstate highway. The Ridgeway of Great Britain is now National Trail and Route 66, America's "Mother Road", is the subject of numerous books and even a song (Bell and Lock 2000; Wallis 2001). The route of the original Highway 101 in California, in large part follows the old "El Camino Real", which may have once been part of an indigenous trail system (Davis 1974[1961]:47). Trails can be nearly forgotten, but the Hopi and the

Nuwuvi are determined to revitalize their culture through the recovery and documentation of their ancient trail systems (Ferguson et al. 2009; Klasky 2009).

The material remains of people's lives may persist long after the people are gone. Our goal as landscape archaeologists is to uncover meaning from those remains. When viewed in the present as an archaeological site, those remains may look static, but it was once living and changing with the people who lived in this place. A trail and everything that exists as part of a landscape is integral in some degree to understanding the people who once lived, and are now living there. The landscape gives context to ancient, historic and modern lives, always changing, encapsulating memory and culture.

Chapter 4: The Study Area

The study area for this project is the 5,358-acre Hopland Research and Extension Center (HREC) located east of Hopland. HREC is a northern California Research facility for the University of California system, founded in 1951 on the former Roy L. Pratt Ranch. Most of the research previously conducted at the HREC consisted of plant and animal science, ecology, range management and wildlife studies, although the HREC supports a variety of studies, from archaeology to soils (Timm and Vaughn ed. 2003).

HREC is located on the west slope of the Mayacmas Mountains, and shares a border on the north with the South Cow Mountain Recreation Area administered by the Bureau of Land Management (BLM), and on the southeast by the Hopland Indian Rancheria. Other adjoining land is privately held. The Mayacmas Mountains separate the Clear Lake basin to the east, from the Russian River Valley. West of the HREC are the Russian River, Highway 101 and the towns of Hopland and Old Hopland in Sanel Valley. The nearest major road crossing the Mayacmas Mountains is Highway 175, which passes just south of the Hopland Indian Rancheria.

The Mayacmas Mountains are one of several mountain ranges located in the geomorphic province known as the North Coast Ranges of California. The mountains of this region are rugged but low elevation, trending northwest to southeast, roughly parallel, with intervening river valleys. This orientation is due to the overall tectonic setting of coastal Northern California, where northwesterly trending strike-slip faults are

prominent. The North Coast Ranges were formed primarily from oceanic sediments and volcanic rocks of Jurassic to Cretaceous age. Nearby Clear Lake is situated within this zone, in a fault-controlled depression, just north of a northeastern trending zone of volcanic activity which created Cobb Mountain, The Geysers, Mount Hannah, Mount Konocti and Borax Lake: all part of the Clear Lake Volcanic Field (Dickinson 1977; Stimac et al. 2001).

The Clear Lake volcanic field, 2 million years to 12,000 years in age, contains the major sources of obsidian for artifacts found at the HREC: the Borax Lake and Mount Konocti obsidians. Mount Konocti is an inactive volcano about 200,000 years old, on the western shore of Clear Lake, near Kelseyville. Cobb Mountain, a prominent landmark, is a dormant rhyolitic and dacitic volcano. Borax Lake is a lake and obsidian dome, which has been used as a quarry used for thousands of years **(**Meighan 1986**).** Nearby is the Sulfur Bank, mined for borax, sulfur and mercury ore within the last 150 years. The old mines and tailings are responsible for some of the mercury pollution present in the southern Clear Lake area. The Geysers, best known today as a geothermal energy producing field, derives the heat for its hot springs and fumaroles from a magma chamber near the surface (Alt and Hyndman 2000; Harden 1998; Schmidt et al. 2003).

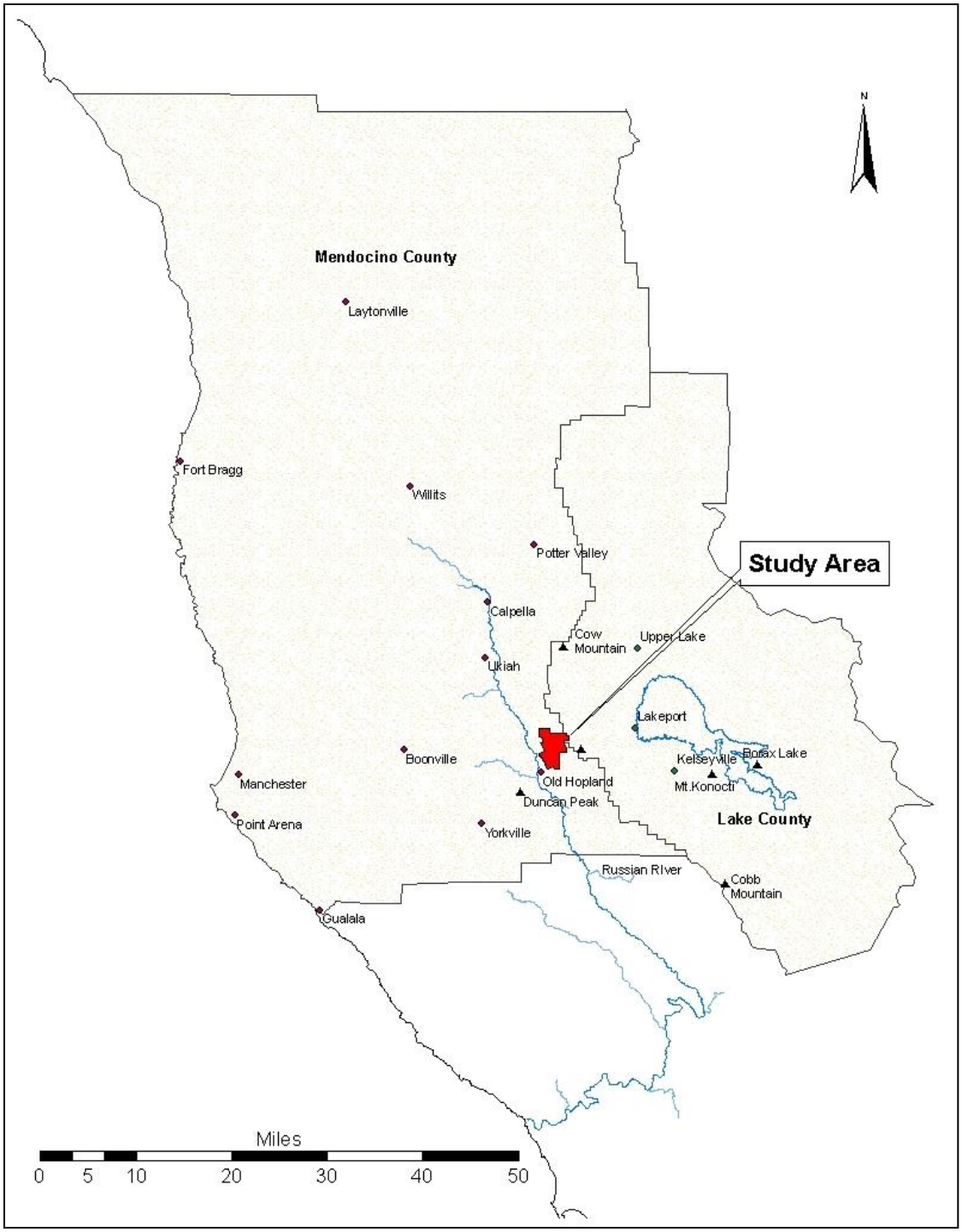

Figure 2: Map of Lake and Mendocino Counties and the study area.

The Maacama Fault zone is an active strike-slip fault zone. It is the northern extension of the Hayward and Rodgers Creek Fault Zones, and a part of the San Andreas Fault system. The last movement on the Maacama Fault zone is estimated at about 300 years ago, between 1410 A.D. and 1660 A.D. (Sickler et al. 2005). It trends northwest to southeast on the western side of the Mayacmas Mountains through the west side of the HREC (Jackson 1989; Sickler et al. 2005; Sims 1988; Upp 1989). One trace of the Maacama Fault zone is marked in part by a string of sag ponds along University Drive, the entrance road to the Hopland Field Station headquarters. The largest and most northerly of the ponds is also the location of one of the largest and longest occupied archaeological sites on the HREC. The ponds are the remains of a single large pond which silted up after tules took root in historic times (John Poor pers. com. November 2010). Landslides, slips and springs are common on the HREC and neighboring properties.

Photo 1: Sag ponds near the Rockpile site along University Drive, view to the south.

The main drainage in the HREC is the intermittent stream, Parsons Creek, a tributary of the Russian River. The creek originates on the northwestern slope of Riley Ridge in the eastern part of the HREC. One other named creek, Morrison Creek, runs northwest along the northern boundary of the HREC to the Russian River. There are several other unnamed ephemeral creeks and drainages, mostly draining to the west. Elevations at HREC range from 500 to 3000 feet. Climate on the HREC is Mediterranean, with warm, dry summers and cool, wet winters. Modern rainfall varies between 37 and 46 inches, based in part on elevation within the HREC. Average rainfall as measured in between 1951 and 1960 is 36.82 inches, frost days 70 – 117 and the lowest temperature recorded in this period was 17 degrees Fahrenheit (Heady 1968; Sjordal et al. 2000).

Pollen analysis from cores taken from nearby Clear Lake indicates that the climate in the Pleistocene was likely cooler and more seasonal than today. There were many reversals from cool to warm until about 10,000 to 13,000 years ago, based on the dominance of *Pinus*, *Cupressaceae*, *Taxacea* and *Artemisia* (sagebrush) species in the pollen samples. Cores from the continental shelf just west of the Russian River correlate well with the Clear Lake cores (Gardner et al. 2008). An increase in *Sequoia* pollen in the ocean cores beginning about 12,000 years ago may indicate an increase in precipitation, not necessarily an increase in upwelling and fog. *Quercus* species began to expand rapidly in the Clear Lake region, with a decrease in cooler climate species about 10,000 years ago. The oaks retreated briefly during abrupt reversal in temperature increase from about 500 to 800 years ago (Adam 1988; Gardner et al. 1988; West 1993; West et al. 2007). The current pollen rain into Clear Lake is dominated by *Quercus* species.

In 1958, Kenneth Gowans mapped eighteen different soils at HREC to 2-acre minimums. Soil variety at the HREC is high because of the steepness of the land. The USDA also mapped HREC soils, producing a report in 1991. This report is more standardized than Gowan's work but with less detail (Gowans 1958; Heady 1968; USDA NRCS 1998a, b, c).

Vegetation on the HREC is described by H. F. Heady (1968) as the California Annual Grassland, which is made up of introduced annual species from the Mediterranean such as bromes, fescues and oats. The original grassland was probably California Steppe (Küchler 1964), dominated by *Stipa pulchra.* Heady mapped seven

different vegetation types at the HREC. The dominant vegetation type is woodland with grass (36%) followed by grassland (22%) and dense woodland (about 21.8%). Grass and trees account for almost 80% of the vegetation, with chaparral following at 17.9%. The rest is accounted for by cultivated areas, rocks and gravel and wet meadows. There are about 500 plant species at HREC, several of which are serpentine endemics (Heady 1968).

The HREC environment represents a great variety of environments, including riparian corridors, vernal pools, serpentine grasslands, chaparral-covered slopes, and oak woodlands. The Pomo and their predecessors used the resources of this land, as the many archaeological sites on the HREC will attest. Before covering the previous archaeological research in and near the HREC, a short chapter will explain the culture chronology of the North Coast Ranges before continuing on with a discussion of previous archaeological work in the HREC area.

Chapter 5: Cultural Chronology for the North Coast Ranges

One of the outcomes of archaeological field work in a particular region is the appearance of the patterns of land use and culture through the examination of assemblages of the remaining material culture of past residents. Archaeologists want to compare and contrast their findings with the material cultures in nearby areas as well as identify periods of cultural continuity and periods of change. What often results is a taxonomy, or classification system that groups material culture so that archaeologists working in a region have a framework of discussion. A classification system of this magnitude requires the consideration of years of work by many archaeologists, and can not be blindly copied from one region to another. As the case of the system used in the North Coast Ranges, considerable revisions were needed over the years because earlier

attempts were not flexible enough to encompass the complexity of culture uncovered over time.

The development of this culture-history taxonomy was developed from the examination of many sites close to Clear Lake. The taxonomy was considerably revised over the years (Beardsley 1948, 1954; Bennyhoff and Fredrickson 1969; Fredrickson 1974, 1984, 1994a, 1994b; Lillard, Heizer and Fenenga 1939). The system is based on a somewhat nested set of patterns, aspects and phases. A **phase** is defined as "the smallest cultural unit recognizable in space and time in Central California" (Fredrickson 1994a:34). An **aspect** is "A sequence of phases within a single district", a district being the term used for a spatial extent "normally larger than a locality but smaller than a region" (Fredrickson 1994a:32, 35). A **pattern** is a unit consisting of "an adaptive mode shared in general outline by a number of analytically separable cultures over a particular period of time within a comparatively large geographic space" (Fredrickson 1994a:40). A Pattern contains one or more aspects. As originally conceived, these units were also related spatially, but this was loosened because of the difficulty in modeling the complexity that archaeologists were discovering. As an example of this, by the early 1980s, it was realized that in the Clear Lake region, more than one group was sharing the same space along Clear Lake on a seasonal basis, having stylistically different toolsets, probably representing two populations (Fredrickson 1994b:79).

Archaeologists also divide time into chronological slices called **periods**. In the Americas, this was an attempt to organize archaeology into a chronology on a model like

that used in Europe: the Paleolithic, Mesolithic, Neolithic. The original system proposed by Wiley and Philips (1958) used the terms PaleoIndian, Archaic, and Emergent, based on periods of time in which a particular economic or technological mode persisted temporally in a region. Within these periods are fitted five of the main patterns found in the North Coast Ranges: Post, Borax Lake, Mendocino, Berkeley, and Augustine. These patterns may be only locally present in areas of the North Coast Ranges or may also exist side by side in certain localities (Basgall 1993; Fredrickson 1994b:100-101; Hildebrandt 2007:86-87; Stewart 1993:161; White et al. 2002).

The Paleoindian period (12000 B.P. - 8,000 B.P.), at the Pleistocene-Holocene transition, was a time when people first spread into California in traveling family bands. In the Clear Lake region, the pattern representing this time period is the Post Pattern. Named for Chester Post, who excavated the Borax Lake Site (CA-LAK-36) in 1938, the diagnostic artifacts for this pattern are the crescent and the fluted concave-base point. Not much is known about this period as very few of the known artifacts have been discovered in a stratigraphic context (DeGeorgey 2004; White et al. 2002). However, geoarchaeological work in 1964 by C. Vance Haynes and Charles Rozaire was able to establish the antiquity of the Borax Lake site (Meighan and Haynes 1970).

The Archaic period was divided into three parts: the Lower (8,000 B.P – 5000 B.P.), Middle (5,000 B.C. – 2,500 B.P.), and Upper (2,500 B.P. – 1,000 B.P) The Lower Archaic was a time of climatic change towards generally warmer and dryer climates, and the use of milling stones for plant food processing. In the Middle Archaic, there was a

tendency towards more hunting and the use of acorns for food. In the Upper Archaic, societies became more complex, with exchange networks becoming more developed. At times during the Archaic period, in the Clear Lake and North Coast Ranges, patterns existed side by side and one was not necessarily a sequential replacement of an earlier pattern. Four of the patterns associated with the Archaic period are described below.

The Borax Lake Pattern was first identified at Borax Lake, on the shores of southeastern Clear Lake and has been found throughout the North Coast Ranges. The pattern ranges in age from about 8000 B.P. to as late as 2500 B.P. in the north and has been dated from about 8000 B.P. to 6500 B.P. around Clear Lake area. Diagnostic artifacts characteristic of the Borax Lake Pattern include wide-stem fluted points, single flake blades and ovoid flake tools.

The Berkeley Pattern, also known in the Clear Lake region as the Houx Aspect of the Berkeley Pattern (Hildebrandt 2007:90), may have spread from its origins in the Bay Area, into the Central Valley and the North Coast Ranges at about 6500 B.P. Most dates associated with this pattern range from 8500 B.P. to 1200 B.P. around Clear Lake, and run as late as 1200 B.P. in the Russian River area (White et al. 2002), and 2500 to 900 B.P in the Warm Springs area (Basgall 1993). Sites which are notable for the Berkeley Pattern in the Clear Lake region are the Mostin Site (CA-LAK-380/381), near Kelseyville, named for property owner Jerry Mostin (White and King 1993), and the Houx site (CA-LAK-261) in Excelsior Valley. The characteristic diagnostics are wide stemmed projectile points, leaf-shaped projectile points, the presence of dark midden soil,

packed dirt house floors. Other diagnostics are fishing implements such as harpoons, spears, fish hooks and sinkers, which are indicative of a more settled life style and emphasis on lake and river resources (Hildebrandt 2007:92;White et al. 2002:452)

The Mendocino Pattern appeared about 5000 B.P. in the northern part of the Coast Ranges and persisted until at least 1500 B.P. Archaeological evidence points to a coexistence with the Berkeley Pattern in the Clear Lake region and also in the Warm Springs area (Hildebrandt 2007:92-93). Artifacts in this pattern include side-notched, corner-notched and concave-base projectile points, cobble tools, basalt core tools, edge-modified flake tools, small gravers, ovate scrapers, manos and metates (Hildebrandt 2007:91; White et al. 2002:461-462). The pattern is widespread throughout the southern part of the North Coast Ranges.

Greg White and colleagues have split the Mendocino Pattern into a Mendocino Aspect and a Hultman Aspect of the Mendocino Pattern, reflecting differences in northern and southern assemblages. They wrote that projectile points in the Mendocino Pattern north and west of Clear Lake were primarily notched chert points, while south of the lake, the Hultman Aspect contained projectile points that were primarily thick leaf-shapes and concave–based with some notched points. The Hultman points were fashioned most often of Mount Konocti obsidian (White et al. 2002:461).

Mendocino sites appear to be temporary camps with little or no dark midden soil. Of the sites excavated in the Anderson Flat Project, Hultman sites tended to have ash

instead of charcoal, a scattering of artifacts and caches of tools (White et al. 2002:485). In the Warm Springs area, the Skaggs Phase, part of a more localized cultural chronology, may be the same as the Mendocino Pattern (Basgall 1993; Basgall and Bouey 1984). Nearly all projectile points in the Warm Springs area were made of chert.

The Emergent period (1000 B.P – 100 B.P.), was a time of technological change, social status, wealth accumulation and increased complexity within territorial boundaries. The bow and arrow began to replace the dart and atlatl. A decrease in the use of obsidian was noted. There seems to have been a tendency towards decentralization of populations and expansion into previously little used areas. This may be a reflection of the use of satellite camps around more sedentary villages, an expansion of population and a need to intensify resource usage, or all of this with local variations (Basgall 1993; Fredrickson 1994b:100-101; Hildebrandt 2007:86-87; White et al. 2002). In the Clear Lake area, the Clear Lake aspect of Augustine Pattern is characterized by triangular Rattlesnake series arrow points, ashy black midden soils, clamshell and *olivella* beads, bead manufacturing drills of chert or obsidian, bone tools, and basalt tools (White et al. 2002:459-460).

Chapter 6: Previous Research

Regional Archaeological Work

Two major undertakings in the region, the Warm Springs Dam project (Basgall 1982, 1993; Peri et al. 1985; Praetzellis et al. 1985; Stewart 1993) and the Anderson Flat project (White et al. 2002) resulted in detailed studies. The Hopland study area is about halfway between Clear Lake, and Lake Sonoma, behind the Warm Springs Dam, so both of these projects are worth mentioning. The Warm Springs Dam project, was undertaken from 1974 to 1984 for the Army Corps of Engineers, and produced an extensive amount of information about the middle Russian River area and the Southern Pomo (Basgall and Bouey 1984; Praetzellis et al.1985; Peri et al. 1985; Stewart 1993;).

The Clear Lake Basin has received a lot of study because of its unique position as a large inland freshwater body, a characteristic that must have been very attractive to people for millennia. The basin has been found to have one of the longest chronological sequences in Northern California (White et al. 2002:445). The Anderson Flat Project was focused on the territory of the Southeastern Pomo. It is the most recent, largest and most definitive archaeological project for the Clear Lake area, but also provides a detailed regional overview. Geoarchaeologist Michael Waters prepared a detailed stratigraphic analysis of the project area. This analysis showed how geologic processes affected the completeness of the archaeological record of Anderson Flat. The early and mid Holocene record, before about 3000 years B.P. had been mostly removed by erosion processes in the fluvial environment, but the depositional environment was more stable after that, providing a more complete late Holocene archaeological record (Waters 2002:123-127).

White et al. (2002:445) and Basgall (1982; 1993) seem to differ about the need for a regional synthesis. At the time, Basgall wanted to emphasize local chronology. The chronology for the North Coast Ranges was less developed in the 1980s than it is now in the 21st century, but as the Anderson Flat work shows, research on the prehistory of the North Coast Ranges is still a work in progress.

Other Regional Studies

One of the key, multicomponent sites in the region is the Borax Lake Site (CA-LAK-36), first discovered and excavated by avocationalist Chester Post of Berkeley in

1938. At the time, the University of California, Berkeley was not interested in his find, but M. R. Harrington of Southwest Museum in Los Angeles was, and he excavated the site in 1938 and published his findings ten years later (Harrington 1948). The site is adjacent to the Borax Lake obsidian flow that separates Borax Lake from the southeastern shore of Clear Lake. Occupation of nearby Clear Lake Basin is believed to have begun between 11,500 and 8000 years cal. BC, at the end of the Pleistocene (Fredrickson and Origer 2002). Fluted points of the Post Pattern have been found near the northeastern shore of Clear Lake (Hildebrandt 2007). These Post Pattern obsidian points may be as old as 11,000 to 13,000 years, based on conservative obsidian hydration curves. Dating of the Post Pattern artifacts has been problematic because of a lack of sites with suitable materials for radiocarbon dating (Hildebrand 2007).

Two other trails studies were recently conducted by graduate students from Sonoma State University. In 2009, Chris Lloyd completed a study of trails and corridors in Central Pomo territory by attempting to predict the location of trails from the main villages of Central Pomo tribelets to the ethnographic village of *Pda'hau* on the coast near Point Arena, through the use of least cost path/corridor analysis. He found that there was some statistical correlation of clustering of known archaeological sites and one group of GIS-generated trails, and paths approximated one modern day road recognized as being the route of an ancient trail (Lloyd 2009:1, 89, 96). Although Lloyd used cultural boundaries and hydrology as impedance layers in his analysis, he recognized some problems with the modeling process, particularly in the ability of the application to model the behavior of the travelers, especially without landscape information which would have

been available to prehistoric people. The Pomo learned from their travels and probably made changes in their routes based on both cultural concerns and efficiency. Lloyd also stated in conclusion that a "…statistically significant result does not mean they are actual paths that the Central Pomo used." (Lloyd 2009:103).

Kat Kubal also completed a thesis that combined GIS analysis in collaboration with the Northern Pomo, to identify possible aboriginal paths between villages and sites first identified by S.A. Barrett (1908) in northern Mendocino and Lake Counties. Her goal was to provide information to allow agencies such as the County of Mendocino to make informed decisions about land use and for the Northern Pomo tribes to manage their traditional cultural resources (Kubal 2010:7-8). She began by comparing the locations of Pomo ethnographic sites described by Barrett (1908) and Stewart (1943) with the work of Mark Gary (1989) and Newland and Much (2008), who were trying to relocate the Barrett sites, and then crosschecked them using site data from the Northwest Information Center. Kubal compared her visually predicted potential trails between the village sites with the best location information, to trails between the same sites generated by a least cost path algorithm in GIS (Kubal 2010:5-6, 51-52, 55, 57). She had some success where least cost paths corresponded somewhat to a few recorded known trail segments, but the least cost paths did not match the alignments. She concluded that the GIS was not able to model human movement as well as she hoped, because the present information is still lacking accuracy and human thought processes are more complex than the variables she was able to use. Kubal's recommendations are that predicted paths be confirmed in collaboration with Northern Pomo elders, and that the process of locating

Barrett's sites continues (Kubal 2010: 110-111). Despite the drawbacks of modeling trails through GIS, both Kubal and Lloyd have provided valuable information as a starting point for agencies, tribes and other land managers for making better decisions regarding the sensitivity of travel corridors in Mendocino County.

Hopland Area Archaeological Work

The area encompassing the town of Old Hopland has been surveyed several times since Stephen Powers (1976[1877]) first drew a sketch of the old village of Sanel (Bignell 2002; French 1990; Haney 2007). In 1990, the Anthropology Studies Center of Sonoma State University conducted a cultural resources investigation of a portion of Valley Oaks Ranch, owned by Fetzer Vineyards. The report included an ethnographic and historical study of the people who once occupied the Sanel Valley and Rancho de Sanel, written by Virginia Patterson (Patterson 1990). A historic village, often called the Old Rancheria, or Apple Tree Village, and a related cemetery, were located and recorded. Two other nearby archaeological sites were identified and recorded (French 1990).

In 2002, Pacific Legacy surveyed an extensive area in the Hopland vicinity for a possible Highway 101 bypass (Haney 2007:1). This area was the ethnographic territory

of the Shoqowa, whose main village was Sanel, near Old Hopland. Some of these same sites were also visited earlier in 2002 by Dan Bignell and others from the Anthropological Studies Center at Sonoma State University. The site presumed to be Sanel (CA-MEN-865) was located around the junction of Highway 175 and Eastside Road. In the 1870s Powers drew a map of the site of Sanel (Powers 1976[1877]:168-169, Figure 19). S.A. Barrett placed the location of Sanel on the south bank of McDowell Creek south of Old Hopland. The name of the village comes from the word *cane'l*, "sweathouse" (Barrett 1908:171-172). Rancho de Sanel was acquired in 1844 by Fernando Féliz, the owner of the Novata grant in Marin County. It encompassed most of the valley which had been the territory of the Shoqowa.

North of Old Hopland, along the Eastside River Road, is the site of the Old Rancheria, also known as Apple Tree Village (CA-MEN-866/H). Apple Tree Village was occupied by the people of Sanel from about 1853 to 1907 (French 1990). Uphill from the village site, is an old cemetery (CA-MEN-2308/H), believed to have been last used in 1908. The Sanel people moved to the current Rancheria, just off Highway 175, southeast of Hopland in about 1908, a few years after the Sanel were told to leave by landowner A.W. Foster.

Middleridge Ranch is located three miles south of the HREC, in the McDowell Valley. A survey of the property was conducted in 1979. Four sites were located: CA-MEN-1600 through CA-MEN-1603. CA-MEN-1600 appeared to be a well developed midden and had cultural features and artifacts. The other three sites were scatters of chert

and obsidian, which were called “tool manufacturing debitage” in the submitted site reports. CA-MEN-1603 and CA-MEN-1602 were apparently examined closer, as it was expected these sites would be destroyed by vineyard operations. CA-MEN-1602 was investigated in May 1979 by Lowell Damon and David Fredrickson. Excavation consisted of 1 meter-square test units and auger holes. Damon and Fredrickson submitted 20 obsidian fragments from CA-MEN-1602 for X-Ray fluorescence testing and found that 11 were of Borax Lake obsidian and 9 were from Mount Konocti obsidian. Three chert bifaces, one complete, two base only, appeared to have fluting. They were assigned to the Borax Lake Aspect, 5000 to 7000 years old, based on dates derived using hydration of obsidian flakes found at the same level in the excavation (Damon and Fredrickson 1979). The collection for CA-MEN-1602 is curated at the Anthropological Studies Center at Sonoma State University, but it was not accessioned until the fall of 2009.

To the north of the HREC in the South Cow Mountain Recreation Area lies a trail feature described as the Norris Trail, connecting the Clear Lake Basin to Ukiah Valley. It was described in a short, unpublished report by E. Breck Parkman in 1975 (Parkman 1975). In 2004, Alex DeGeorgey, Diana Mongeau and others conducted fieldwork for the Bureau of Land Management (BLM) and in 2005, they produced a report describing the No’boral-Co’kadjal Trail, or the Norris Trail (CA-LAK-940) (DeGeorgey and Mongeau 2005:1, 48). The trail was indicated by a dotted line on a General Land Office (GLO) map from 1896. Trail segments which had not been affected by off road vehicle use tended to be fairly wide: 3 to 6 feet wide gentle swale as much as a foot deep. Some sections had been graded or were not passable due to thick brush (p.48-51). One

interviewee for this study had been told that in the past, brush was burned off to keep the trails open (p.70). Activities between villages on or near the trail are described in Barrett (1908), Loeb (1926), Stewart (1943) and several oral histories (DeGeorgey and Mongeau 2005).

Benmore Valley has also been the site of archaeological survey. In 1977, Werner, recorded two sites which may be related to a trail mentioned by Kroeber (1925[1976]) (Werner 1977a, b). The first site, CA-LAK-956, was a segment of a modern trail near the Dorst Ranch barn and reservoir on the west side of the south end of Benmore Valley (Werner 1977a). CA-LAK-957, located in northwest Benmore Valley, was recorded as a trail "… about three feet wide and 6" deep. It looked well traveled." (Werner 1977b).

In 1999, Tom Origer and Associates investigated and recorded seven sites in Benmore Valley. Most of the sites consisted of lithic scatters of obsidian or chert and obsidian, with two possible midden sites, some fire cracked rock, flaked tools and a partial pestle. The sites were located in the north near CA-LAK-957 or in the south part of the valley near CA-LAK-956. Some of the sites had been disturbed by vineyard operations or cut by a dirt road (Origer 1999 a,b,c,d,e,f,g). None of the studies mentioned finding artifacts with diagnostic value, so the sites are of unknown age and affiliation.

Archaeological Work at the HREC

Although workers at HREC had been collecting surface finds since the 1960s, Robert Orlins recorded the first archaeological site CA-MEN-852 (Rockpile) (Orlins 1974). Informal archaeological survey was conducted beginning in the late 1980s. In the first year, 1988, 13 sites were recorded by Mark Gary, Charles Vaughan, Deborah Mclear-Gary, and Francis Berg, and two more sites were found in the next two years. Charles Vaughn, director of the HREC, asked Dr. Robert Bettinger of UC Davis to arrange an archaeological study. In the in the summer of 1999, three undergraduate students from UC Davis, under the supervision of Dr. Bettinger, surveyed portions of the HREC and accessioned earlier surface finds as a collection at UC Davis Museum of Anthropology, which were curated at HREC headquarters (Sjordal et al. 2000).

In 2000, the UC Davis students: Paul Sjordal, Alejandro Guerrero and Alyson Noel, produced a preliminary report of the archaeological resources of HREC (Sjordal et al. 2000). The report described the 17 known sites and nine newly identified sites, named HREC-1 through HREC-9. The students updated the site report for CA-MEN-852 ("Rockpile") (Sjordal et al. 2000). This site is located just south of a large outcropping of rocks, next to the largest of the string of sag ponds along University Drive (See Photo 1). Orlin's site report noted two, possibly four round depressions which may have been housepits, along with midden and numerous lithic artifacts and some bone. Orlins stated that this site had potential to yield more information (Orlins 1974). The 1999 site report update listed newly discovered round cobbles and net sinkers, an obsidian drill and a shell bead.

Taryn Wise-Harthorn, a graduate student with Dr. Bettinger at the University of California, Davis, ran a field school at the HREC from 2000 through 2002. She conducted an additional survey (2000) and the excavation of eight sites. Other than two joint presentations for the Society for California Archaeology (SCA) in 2001 and 2002, a 2003 Society for American Archaeology (SAA) presentation, and a short article for the SCA newsletter in 2003 (Wise-Harthorn 2003a), her findings were not published. Wise-Harthorn discontinued study at the HREC. Field data and notes from this archaeological work was extracted from an old computer and given to Donna Gillette. The staff of the UC Davis museum transcribed student notes from the 2000-2002 field schools and recreated a field map from the information contained in the student data (Donna Gillette pers. com. 2009; Morgan and Wise-Harthorn 2001; Wise-Harthorn and Tushingham 2002).

In the 2003 SCA article, Taryn Wise-Harthorn described the results of the excavation of CA-MEN-852, CA-MEN-2216, HREC-8 and HREC-9. She categorized CA-MEN-2216, HREC-8 and HREC-9 as “hunting/butchering sites” and CA-MEN-852 as a “seasonal-base camp”, according to a nomenclature worked out in conjunction with her co-authors for the 2001 and 2002 SCA presentations (Wise-Harthorn 2003a:20). CA-MEN-852 is the site located on the north side of the largest of three sag ponds along University Drive, south of HREC headquarters. No other seasonal base camps were identified at HREC. Other identified sites were described as lithic scatters, chert quarries and petroglyph sites.

Taryn Wise-Harthorn sent obsidian from the three sites: CA-MEN-852, CA-MEN-2216 and HREC-9, to Tom Origer's Obsidian Lab for hydration analysis. All these samples were obsidian debitage except for one obsidian biface fragment. Based on the results of the obsidian hydration, these four sites are less than 3000 years old. The obsidian samples from this analysis have been misplaced, although Tom Origer retained a copy of the original report and provided that to Donna Gillette (Gillette, pers. com. 2009).

Wise-Harthorn also reported the discovery of two Houx Contracting Stem projectile points at CA-MEN-852 (Wise-Harthorn 2003a:21). Houx Contracting Stem (HCS) points are described by White and Allyson of being from a short duration style (Houx Aspect as a Clear Lake expression of the Berkeley Pattern), based upon tight standard deviations of hydration banding dating from about 2600 to 1800 cal. years BP. However, bifaces of this style were also found in sediments dated between 4000 and 8000 cal. BP in the Anderson Flat Project (White et al. 2002:228). The projectile point style may be part of a continuing tradition of the Berkeley Pattern in the Clear Lake region and are apparently present in the earlier Mostin Phase of the Berkeley Pattern dating from 6400 to 4300 cal. BP (Hildebrandt 2007:92).

In 2005, Donna Gillette, a PhD candidate from UC Berkeley, created a proposal to continue her research on rock art at the HREC. Gillette's M.A. thesis explored the meaning and distribution of a type of cultural marking on blueschist boulders known as a "pecked curvilinear nucleated" (PCN) petroglyph (Gillette 1998). HREC had ideal research facilities, and numerous archaeological sites, including several known PCN

sites. Donna Gillette also received permission from Robert Bettinger of UC Davis to use Wise-Harthorn's abandoned data. Gillette proposed to conduct surveys, complete maps and photographs, and conduct shovel testing and other fieldwork around PCN boulders. She invited participation of members of the Central Pomo tribe, whose ethnographic territory includes the HREC. Gillette's fieldwork is still ongoing (Gillette pers. com. 2009). In 2009, she submitted 150 obsidian samples from CA-MEN-852, HREC-8 and HREC-9 to Tom Origer's Obsidian Lab. The calibrated results gave the same age range as the samples submitted by Wise-Harthorn; the oldest was 2508 Cal years BP (Gillette, unpublished hydration data 2009).

As of 2011, the several archaeological initiatives at the HREC have identified 35 sites, consisting of the following**:** seven quarries, eight sparse lithic scatters, eight lithic scatters with other artifacts, six petroglyph sites, one known camp with midden, and five historic sites, two with chert and obsidian flakes. Table 1 below contains these sites and others that are important to this thesis study.

This table will not remain the definitive list. New sites, especially historic cabins, quarries and lithic scatters will continue to be discovered and recorded. The current information is sufficient to demonstrate the use of the HREC landscape by people from prehistoric times through the present. Just as the physical landscape has evolved in response to climate, geologic processes and land use, the material remains of cultures past and present reflect an ongoing changing relationship with the land.

Table 1: Sites Located at or near the HREC as of Spring 2011

Site Identification	Who/When Recorded	Characteristics of the site	General Location
Rockpile (CA-MEN-852)	9/6/1999, UC Davis team	Hunting or seasonal camp with midden	Near main sag pond at HQ
Sanel (CA-MEN-865)	Many teams	Ethnographic village	Near Old Hopland
Apple Tree Village (CA-MEN-866/H)	6/5/1990	Ethnographic village	Downhill to west of HREC, off Eastside River Road
Old Cabin Site, possibly Mrs. Kelsey's		Historic materials	Near eastern boundary of the HREC
James Cabin site		Site of old cabin	On a dirt road in the northwest part of the HREC
Holliday Cabin site		Site of old cabin.	Northwest HREC
Middleridge Ranch (CA-MEN-1602)	2/9/1979, T. Origer, Damon, Fredrickson Dec 1979	Lithic scatter, excavated in June 1979	Private property in McDowell Valley
Vimark 1 (CA-LAK-1947)	11/9/1999, Origer and Assoc.	Lithic scatter near CA-LAK-957.	Private property in NW Benmore Valley
Vimark 2 (CA-LAK-1948)	11/9/1999, Origer and Assoc	Lithic scatter with dark soil	Private property in NW Benmore Valley
"Trail" site in Benmore Valley (CA-LAK-957)	08/17/1977, Werner	Trail segment about 2000' long, 3' wide.	Private property in NW Benmore Valley
Parasite (CA-MEN-2204)	8/12/1988 Gary et al.	Lithic scatter	South of Hagan Lake
Chuck's Chert Quarry (CA-MEN-2205)	8/12/1988 Gary et al.	Chert quarry with chert cores, bifaces, flakes	East of HREC HQ
Fern Spring (CA-MEN-2206)	8/9/1988 Gary et al.	Lithic scatter, midden with 2 hopper mortar slabs	NW of Hagan Lake
Cemetery (CA-MEN-2308/H)	6/9/1990	Apple Tree Village Cemetery 1853-1908	Uphill from Apple Tree Village
Field Site #1 (CA-MEN-2309)	6/5/1990 French, Jablonowski ASC	Midden, sparse lithic scatter, FAR, historic refuse, obs proj pt (possibly Houx)	Along Eastside River Road, north of Old Hopland
Field Site #2 (CA-MEN-2310)	6/5/1990 French,	Sparse lithic scatter, obs shouldered proj	Between Eastside River Road and

	Jablonowski ASC	pt (possibly Houx)	HREC, north of Old Hopland
Woodpecker Heaven (CA-MEN-2311)	8/9/1988 Gary et al.	Lithic scatter	Near HREC HQ
Hagan Lake Outlet (CA-MEN-2312)	8/9/1988 Berg, Gary	Lithic scatter	East of Hagan Lake
Huntley Peak Petroglyphs (CA-MEN-2313)	10/6/1988 Gary et al.	Petroglyphs PCN	In saddle near Huntley Peak
Vassar Corner (CA-MEN-2214/H)	10/6/1988 Gary et al.	Lithic and tool scatter, historic barn remains	South of old airstrip
Talus Slope Quarry (CA-MEN-2215)	10/6/1988 Gary et al.	Chert quarry, cores, bifaces	East of Huntley Peak
Madrone Grove (CA-MEN-2216)	10/6/1988 Gary et al.	Lithic scatter, groundstone tools	On Parsons Creek
Hidden Hill Petroglyph (CA-MEN-2221)	11/21/1988 Gary et al.	Petroglyphs PCN and cupule	On hill west of HREC HQ
Airstrip (CA-MEN-2222)	11/21/1988 Gary et al.	Lithic scatter and groundstone tools	Near old airstrip
Buck Spring (CA-MEN-2223)	11/21/1988	Lithic scatter, pestle frag near head of spring.	Near MEN-852
Watershed Down (CA-MEN-2224)		Petroglyphs PCN	On hill southwest of HREC HQ
Glittering Rock Petroglyph (CA-MEN-2300)	5/25/1990	Petroglyphs Cupule	In creek east of HREC HQ
HREC-1, Riley Ridge (CA-MEN-3351)	9/5/1999 UC Davis team	Sparse lithic scatter	Near Kelsey Cabin
HREC-2, Kelsey Cabin (CA-MEN-3352)	9/6/1999	Historic house and orchard	Kelsey Cabin site on topo map Purdys G.
HREC-3, Chaparral Hunting Camp, (CA-MEN-3353)	9/9/1999 UC Davis team	Lithic scatter and hearth	Near Coon Lake
HREC-4, Rattlesnake Chert Quarry, (CA-MEN-3354)	9/6/1999 UC Davis team	Chert quarry, flakes and bifaces	South of Hagan Lake
HREC-5, Madrone Chert Quarry, (CA-MEN-3354)	9/6/1999 UC Davis team	Chert quarry, hammerstones, bifaces	On hillside northeast of HREC HQ
HREC-6, Vineyard Site, (CA-MEN-3355)	9/2/1999 UC Davis team	Groundstone, lithic scatter, a charmstone	Boundaries indistinct in a plowed vineyard near HQ
HREC-7, Rabbit Pens, (CA-MEN-3356)	9/6/1999 UC Davis team	Lithic scatter	Near Parson's Creek and HREC HQ
HREC-8, Parsons Creek Narrows, (CA-MEN-3357)	9//1999 UC Davis team	Midden, lithics, metate	Near Parson's Creek
HREC-9, Middle Lake	9/6/1999 UC Davis team	Lithic scatter, grooved cobbles (net sinkers?)	Near a sag pond
HREC-10, Sealed Spring (CA-MEN-2210)	8/12/1988 Robert Carreras UC Davis	Lithic scatter	
HREC-11, Guard Llama Site		Lithic scatter	
HREC-12, Bunnyhead Knoll	7/27/2000	Lithic scatter and quarry	Near HREC Entrance
HREC-13, Barbara's Bump	7/28/2000	Lithic scatter	Near HREC entrance
HREC-14, New Site	12/5/2008	Petroglyph, PCN	Near University Road entrance
HREC-15 Watershed Down 2 (033)		Petroglyph PCN	Downhill from Watershed Down
CA-xxx Pole Line Quarry at 029		Chert quarry	Just outside eastern boundary of HREC, at waypoint 029 and power pole line.

Foster Pasture Quarry		Chert quarry in a draw.	Western edge of the HREC in Foster Pasture.
Hill Top Quarry Site (CA-MEN-2847)	11/8/1994, Greenway, BLM	Large chert quarry with many stages of tool mfg found	West of Rickabaugh Glades on BLM and private property.
University Drive Site (CA-MEN-3216)	8/1/2002 Shapiro and team, Pacific Legacy	Lithic scatter in 2 concentrated areas	Bisected by University Drive, east of Old Hopland

Chapter 7: The Cultural History of the Hopland Area

The history of the Russian River and Clear Lake areas is a long and colorful story. Included here in this account is the setting as painted by early ethnographers, historians and local people who remember the "old days". The story begins with the Pomoan people living within the territories they claimed, but then they were met by various explorers and settlers seeking land. This was a chaotic and troubling time for the Pomo, as their land was taken by the newcomers and they lived a marginal existence until very recent times.

A.L. Kroeber described the Pomo as "one of the best known groups in California", (Kroeber 1976[1925]:222). Most of the knowledge of the Pomo at the time of historical contact is known from the writings of these chroniclers and the ethnographers who followed them: George Gibbs 1972[1852]; John W. Hudson (N.D); Stephen Powers 1976[1877]; Van Wrangell and Kostromitonov (1974[1839]). Early accounts of the Pomo and other Northern California tribes were written by Stephen

Powers, an adventurer who was described by editor Robert E. Heizer as a "pioneering anthropologist, newspaper publisher, sheepherder, gold miner and an expert in the raising of Merino Sheep" (Powers 1976[1877]:1). Powers himself compiled his notes based on visits to California Indians conducted in the summers of 1871 and 1872 (Powers 1976[1877]:8).

John W. Hudson was a doctor who left his profession to become an ethnographer of the Pomo after his marriage to an artist, Grace Carpenter of Potter Valley. Grace Carpenter's father, Aurelius O. Carpenter, was a noted local photographer. Hudson's unpublished ethnographic notes and Carpenter's original glass photographic plates reside in the archives of the Grace Hudson Museum in Ukiah.

Probably the best known of the ethnographers of the Pomo Indians is S. A. Barrett. Barrett's contact with the Pomo people was very long lasting. His family moved to Calpella, (near Ukiah) in 1894, when Barrett was 15 years old. He began doing his own "field work" in 1896, and subsequently attended the University of California, Berkeley. In 1908, Barrett received the first Ph.D. in Anthropology under R.F. Kroeber (Smith-Ferri 1996:11). Barrett's ethnographic output was extensive. Barrett consulted with all of the Pomo linguistic groups, and produced a map of the linguistic boundaries and main villages for his Master's Thesis, named "The Ethnogeography of the Pomo Indians and Neighboring Tribes", and granted in 1906. Barrett continued writing about the Pomo Indians into the 1950s, when he produced a two-volume "Material Aspects of

the Pomo Culture". Many of his 98 consultants were born before the Gold Rush (Barrett 1908; Driver 1953:716).

Omer Stewart described his 1943 ethnography as a supplement to Barrett's 1908 ethnogeography and to Kroeber's 1925 *Handbook of the Indians of California.* Stewart concentrated on filling in tribelet boundaries, and visiting locations with informants when possible. Stewart was able to validate Barrett's boundaries and improve them (Stewart 1943:29). Stewart is best known for his work on the Peyote Religion, for which he received his Ph.D. from the University of California in 1939. He is also the author of a book on the use of fire for land management by Native Americans, published in 2002 by Henry T. Lewis and M. Kat Anderson (Stewart 2002). Other important ethnographers of the Pomo people include Edward W. Gifford (1923, 1926, 1928, 1976[1967]), Abraham M. Halpern (1964), F.B. Kniffen (1939), Robert F. Kroeber (1976[1925]), Edwin M. Loeb (1926), Sally McLendon (1973, 1977), and David W. Peri et al. (1985).

Central Pomo Geography

According to the ethnographies of the Pomo, the Central Pomo occupied a territory bordering the Eastern Pomo at the crest of the Mayacmas Mountains, to the Pacific Ocean. The irregular northern and southern boundaries ranged from the Navarro River mouth to approximately Gualala in the south, the Russian River Valley from just north of Ukiah, nearly to Cloverdale in northern Sonoma County. This area encompasses

riverine, mountain, redwood and coastal environments (Barrett 1908; Stewart 1943). Several maps drawn by ethnographers are illustrated below for comparison.

In his ethnography, Barrett clearly stated his goal to establish the number of dialects of Pomo, the boundaries of the Pomo language group and its dialects, and the location of villages and camps. When describing a boundary, Barrett was careful to ask people who lived on either side of the boundary, including people of neighboring language groups. When recording the location of a village, he asked more than one person where a village was located (Barrett 1908:7-9).

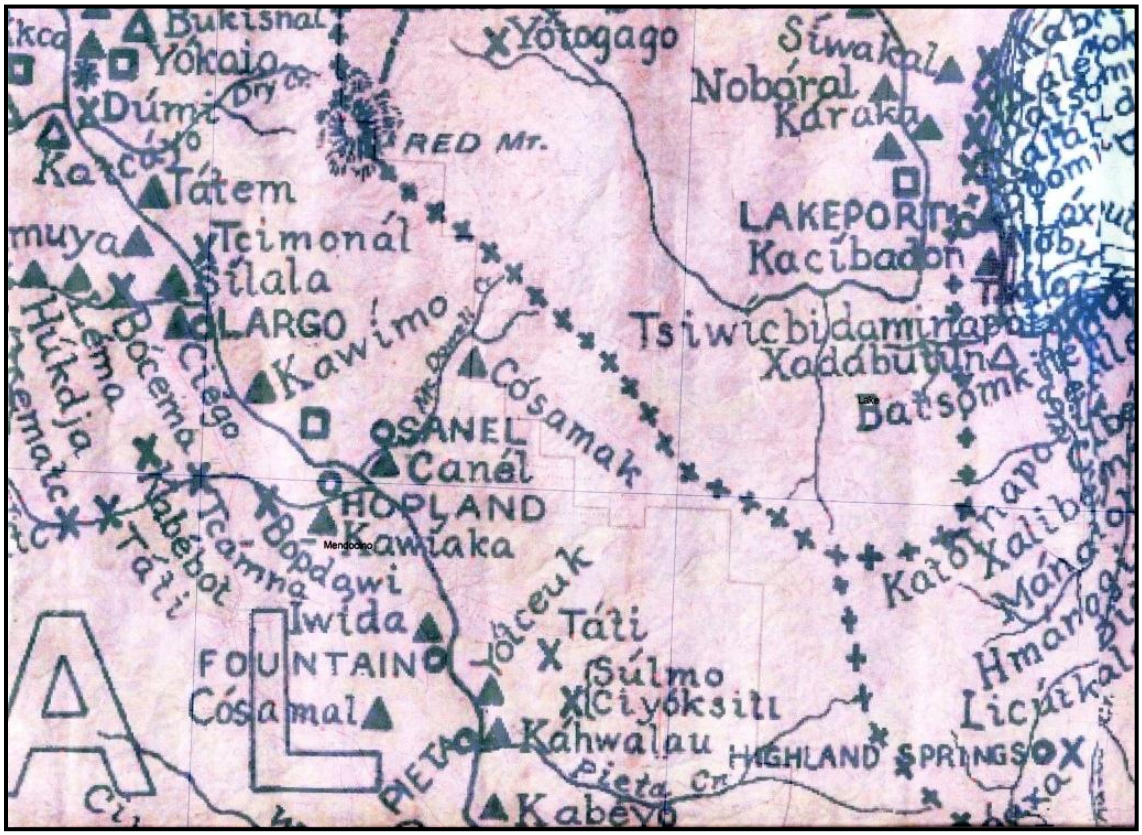

Figure 3: From Barrett (1908), showing a detail of Central Pomo territory near Hopland.

Omer Stewart's map is based on a topographic map, and shows more geographic detail than Barrett (1908) but is still lacking enough detail to place the boundaries on a modern map (See Figure 5). It is best to examine the map and the textual detail of the boundaries together with modern maps. Stewart's stated purpose for developing this study was to confirm and "supplement" the boundaries described by Barrett (1908) and Kroeber (1976[1925]) Stewart (1943:29). Sally McLendon and Robert Oswalt's (1978:274) map of the Central Pomo, (Figure 4), is an updated version of Barrett (1908) in Figure 3, with geographic features and modern towns.

The map in Peri et al. (1985) was based on Barrett and Stewart also, but contained more geographical information and newer sources (Peri et al 1985:6-12, Map 2a). The Peri et al. 1985 report, generated as part of the Warm Springs Dam project, was directed towards a better understanding of the Makahmo Pomo, the important southern neighbors of the Central Pomo.

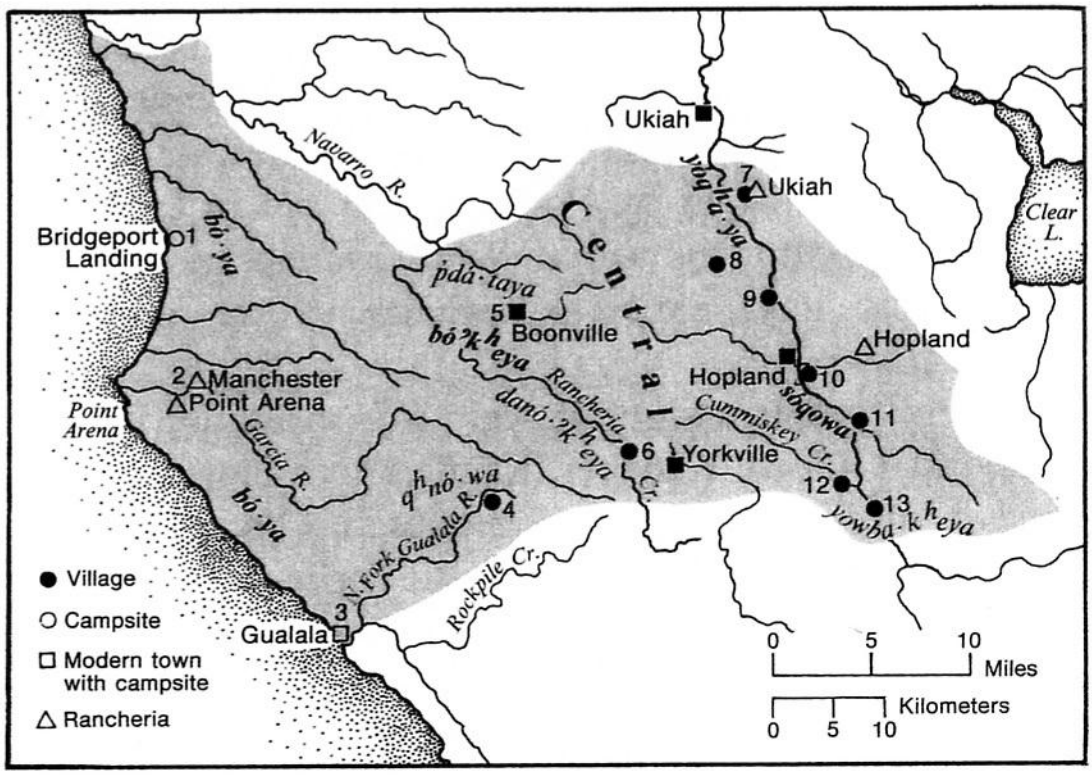

Figure 4: Central Pomo territory (From Figure 4, McLendon and Oswalt 1978:278).

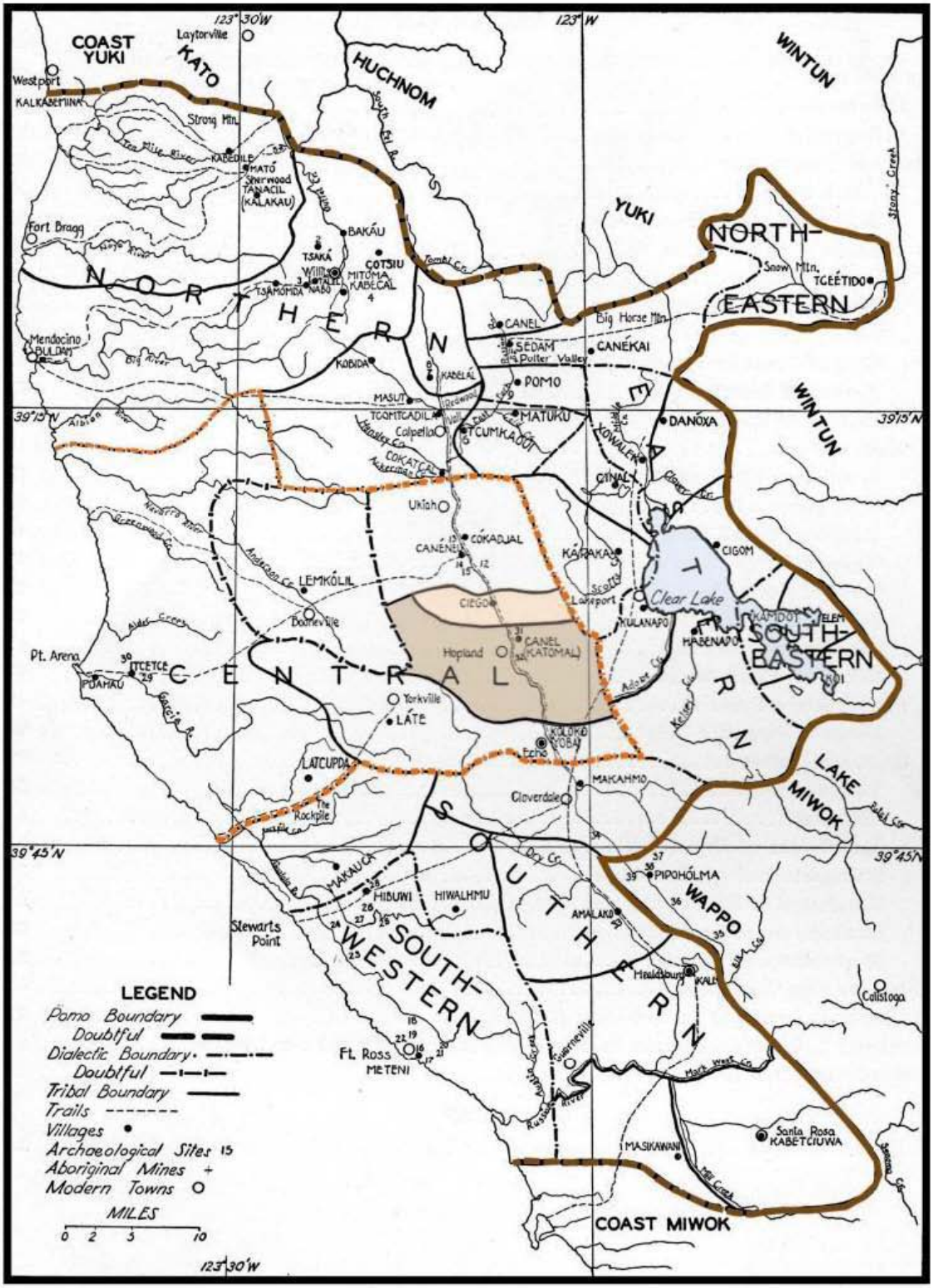

Figure 5: Pomo boundaries, highlighting groups discussed in this thesis. Map adapted from Stewart (1943).

Pomo Neighbors

In Figure 5, the neighbors of the Pomo are shown. The Coast Yuki, Huchnom, and Yuki are three dialects of the Northern Yuki language as described by Elmendorf (1968) and Golla (2007:81). The Wappo spoke a Yukian language distinct from Northern Yuki and heavily influenced by the Pomo languages. In the deep past, much of the area occupied in ethnographic times by the Northern, Central and Southern Pomo may have been occupied by the Yuki (Fredrickson 1984:511). The Miwok and Wintun people are believed to have moved into the Clear Lake area, the Miwok from the Bay Area to the south around 2500 years ago (Fredrickson 1984: 511), and the Wintun from the northeast roughly 1500 years ago (Golla 2007:77).

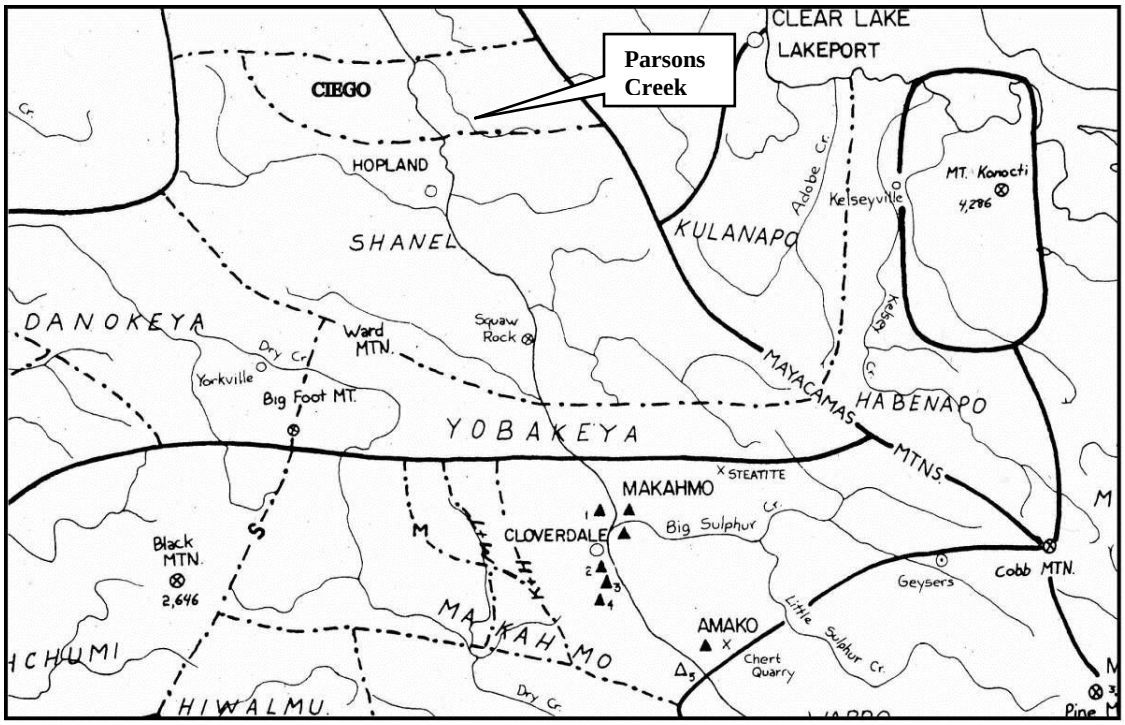

Figure 6: Boundaries of the Ciego, Shanel, Yobakeya and Makahmo Pomo tribelets. Map adapted from Peri et al. (1985:Map 2a).

The Shokawa

Within Central Pomo territory, were numerous tribelets, each of which was an individual political entity. There was at least one main village in each tribelet area, and the villages controlled their own land for hunting, gathering and fishing (Barrett 1908:16). The tribelets occupying territory that includes the HREC are the Shokawa (also called the Shanel, Čokoa or Hopland Indians) and the Cie'go, their northern neighbors. The territory of the Shokawa extended from 2 miles north of Hopland on the Russian River, to 6 miles south, reaching the crest of the Mayacmas Mountains on the east, then south to include the Sanel Valley, Dooley Creek, McDowell Valley, and Pieta Creek, and west to Feliz Creek and Cummisky Creek, for a total of about 70 square miles, that included 8 miles of Russian River riverfront (Stewart 1943:45).

Omer Stewart's Hopland informant said that the Cie'go were a group who had split away from the Shokawa after the arrival of the whites. They were a buffer tribe between Cokoa and Yokaya (Stewart 1943:45). Barrett located the village of *cie'go* on a small knoll where "the ranch house of the Crawford Ranch now stands…." (Barrett 1908:173). According to Peri et al. (1985:Map 2a), the northern boundary of the Ciego was drawn from the crest of the Mayacmas, west across the mountains to the confluence of Parsons Creek with the Russian River, near the Ruddick Ranch. The south boundary of the Cie'go, shared with the Shokawa, as drawn by Peri et al. (1985: Map 2a) (See Figure 6 above), extended west from the ridgeline, down to the east-west course of Parsons Creek where it bends to the northwest towards the HREC Headquarters, then west to the

Russian River. The Cie'go territory extended about three miles along the Russian River (Stewart 1943:45).

Stewart and Barrett identified many village sites within Shokawa territory. These sites included Sanel (or *cane'l*), the name derived from the word for "sweathouse" (Barrett 1908:171), *Ka'wimo* ("little hole", near a poison spring), *Kabebot* (mythical place), *Iwida*, the fishing camps *Kabeyo* and *Ka'hwalau* (at the confluence of Pieta Creek and the Russian River), *Makatcam*, *Cepda*, and *Kcakaleyo* (dance grounds). Additionally, *Katabel* and *Kaletslu* were villages occupied after Sanel was abandoned. *Cō'samak*, in McDowell Valley near the head of McDowell Creek, and 1 ¾ mi from Old Hopland, was also part of the Shokawa territory. Barrett said the village had been abandoned for a long time; possibly the people died from a disease or, according to myth, they turned into birds and flew away (Barrett 1908:172). Not all of these villages were occupied at the same time. Reasons for abandoning a village varied, from depletion of resources, to the presence of contagious diseases. Sometime groups of people split from a village and moved elsewhere for a time (Barrett 1908:17).

The Shokawa were distinguished by having one of the most complex political systems of the Central Pomo. Stewart (1943:45-46) reported that they had 20 chiefs with differing functions. He indicated this number with a question mark next to it, but then elaborated on the hierarchy of chiefs, (both male and female), stating that two main chiefs were ultimately in charge of village activities. In comparison, the Yokaya were said to have had four chiefs (McLendon and Oswalt 1978:276).

Stewart wrote that there were no chert quarries in Shokawa territory that were used by the Shokawa, yet there are a number of quarries identified on the HREC that show signs of use (Stewart 1943:46). For instance, the 1988 site report for CA-MEN-2205 (Chuck's Chert Quarry) listed "roughed out bifaces, performs, flakes, surrounded by a moderate scatter of chert debitage" (Gary and McLear 1988). Likewise, CA-MEN-3461, (Madrone Chert Quarry) had "hammerstones, flakes and unfinished bifaces" (Sjordal et al. 2000). There is no timeframe of use for these quarries. Chert presently has no dating method as exists for obsidian. Each quarry may contain chert in different colors and different degrees of suitability for tool making. Red, brownish, black, green, blue and white colored chert have all been observed in the quarries of HREC and the surrounding region, so tracing back to a specific quarry would be difficult based on color alone.

Trade and Travel

Tribal boundaries were permeable to travelers. The Pomo people traveled long distances to the coast, to Clear Lake, and along the Russian River (Kniffen 1939:371; Loeb 1926:92-94; Stewart 1943:46, 55-56). Longer distance travel necessitated passing through boundaries of their neighbors, even those who were unfriendly. For example, Stewart wrote that the tribes on the Russian River all used the same route to Bodega Bay (Stewart 1943:52).

Although when discussing trade relations, Davis (1974 [1961]) combined all Pomo groups into one category, the Pomo traded extensively with their neighbors and probably with each other as well, as allowing groups outside the area to gather raw materials. If one refers back to Davis's sources, there is more detail to be found. For example, the Eastern Pomo were said to have acquired iris fiber cord, arrows and sinew backed bows from people to the north, seafood such as *haliotis* and seaweed, plus shells and the fur of seals or sea otters from the west, magnesite from the east and clam shells from the south. In return, they gave fish, acorns, skins and magnesite (Kroeber 1976[1925]:257). The Yuki traded with the Northern Pomo for seafood and seaweed (Kroeber 1976[1925]:167).

Laetitia Sample (1950) covered the same information as Davis (1974 [1961]) but separated out the different Pomoan groups to some extent. Most of her information about the Central Pomo came from Stewart (1943). From Stewart we learn that the Shokawa brought acorn meal to the Bokeya on the coast when they came to gather salt and seafood, and got tan-oak acorns from the Danokeya, who lived near Yorkville. The Shokawa also traveled to the Kulanapo at Clear Lake for unbaked magnesite, obsidian and lake fish. Kniffen described the free access to fishing, waterfowl, angelica root, magnesite, and obsidian among the Clear Lake peoples (Kniffen 1939:360; Stewart 1943:46).

Both Sample and Davis produced maps showing the general location of many trails in California, and Davis was able to show that some trail routes were the basis of

major roads and highways in modern California (Davis 1974 [1961]:47-48). An examination of Davis's Map 2 shows a tendency towards roughly east-west trade relations, an observation also made by Sample (Davis 1974[1961]:Map2). Sample suggested that this phenomena may have been due to the distribution of ecological habitats across California that differ most from east to west, and people preferred to trade for items that could not be found or made within their own, or their neighbor's territory (Sample 1950:5). Sample wrote that she deposited a 1:500,000 map of trails at the California Archaeological Survey (the Anthropological Research Facility at UC Berkeley) (Sample 1950:1), but the map went missing sometime since then, and a search has not yet located it (Donna Gillette pers. com. February 2011).

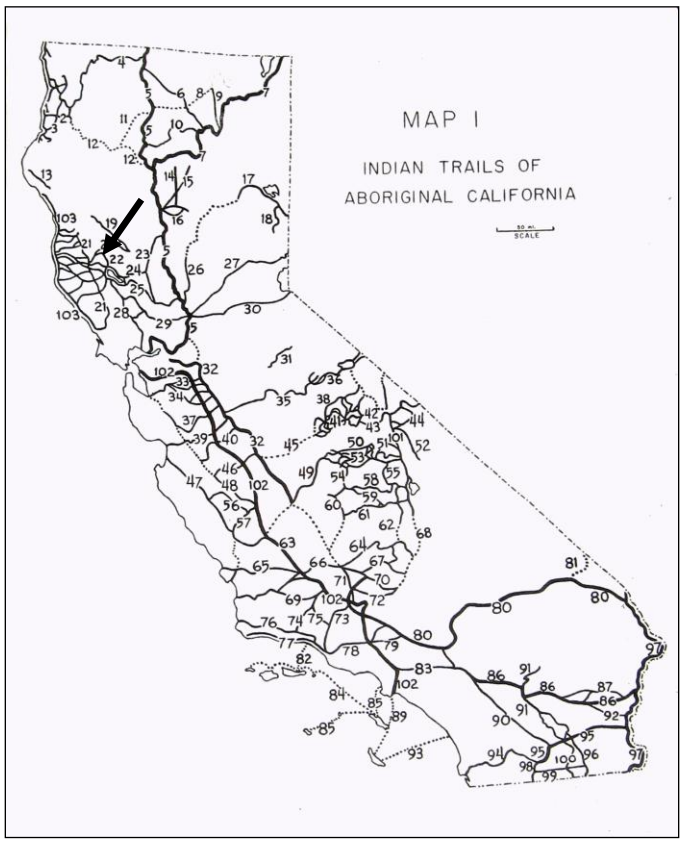

Figure 7: Map adapted from Davis (1974[1961]). The arrow points to Clear Lake.

Another type of exchange, the trade feast, was held when a group had a surplus of some food, such as fish, and they would invite other groups to feast at their village. It was a way of spreading the wealth and ensuring reciprocity when the village had lean times (Bean and Theodoratus 1978:298). When there was abundance and a feast was planned, runners would carry invitation sticks to other villages. One would break off a stick for each day until the day of the feast (Loeb 1926:192). Loeb also said knotted strings were used to count the number of travel days. For instance, a knot was added to a string for each day of travel (:230-231).

Barrett also recorded several explanations for the use of knotted strings and sticks for invitations to ceremonies. There were several accounts given by Barrett's informants, but the main point of the accounts was that sticks and knotted strings were two of the ways the Pomoan people kept count, and invitations comprised of sticks and or string were carried by messengers to other villages (Barrett 1917:402).

The Shokawa were very friendly towards the Danokeya (See Figures 5 and 6), and allowed them to take fish from the Russian River, because their own streams were too small for good fishing (Stewart 1943:47). The two main villages of Danokeya were *Late* and *Maboton.* Otherwise, the Shokawa seemed to be enemies of their neighbors and were known as fierce fighters, who maintained their borders through fighting (Stewart 1943:45).

The Shokawa were not on good terms with their neighbors to the south, the Makahmo Pomo. The main reason for discord between the Makahmo and Shokawa was fishing rights, but they still allowed other tribes to cross their boundaries when traveling (Peri et al. 1985:208; Stewart 1943: 45, 52). Relations between the Southern Pomo and Central Pomo were probably not always strained. Marriage partners from Yorkville and Hopland tribelets were preferred by the Makahmo (Peri et al. 1985:174). However, one of Stewart's Shokawa informants spoke of a "war" triggered by the killing of some young Shokawa who were "courting in Cloverdale" (Stewart 1943:45). The Makahmo apparently traded the Danokeya for acorns and also traveled north along the trail along the east side Russian River as far as the Yokaya territory for army worm caterpillars which appeared on ash trees in the late spring (Peri et al. 1985:210-211, 217; Map 9a, Appendix E).

Sanel was a craft center and centrally located for trade. The Shokawa manufactured shell beads from clamshell they brought back from Bodega Bay. The visits to Bodega Bay had to be undertaken at night, skirting enemy villages, presumably those of the Makahmo. Only the fittest men who could travel fast made these trips (Shawn Pady pers. com. November 2010; Stewart 1943:46).

Between the Shokawa and the Makahmo was a small tribe of "warriors" called the Yobakeya (Stewart 1943:46-47). Their territory covered about 5 miles along the river. Their one permanent village was *Koloko* near Echo Station. It is no longer on the topographic maps, but was centered south of Cummiskey Creek, but north of the Sonoma

County line. Stewart reports that the Yobakeya were wiped out within ethnographic memory when they were getting tan-oak acorns in the Southern Pomo Yotiya (Rockpile Indians) territory (Stewart 1943:47). The presence of this Central Pomo tribelet at Koloko may be evidence of strife and changing boundaries between the Central and Southern Pomo because the village name is Southern Pomo in origin, but the inhabitants were Central Pomo (McLendon and Oswalt 1978:282; Stewart 1943:46).

At the time of Féliz's arrival in 1844, Sanel was the main village of the Shokawa. When Stephen Powers visited Sanel in the early 1870s, he sketched the "ruins of an old Indian town", near the settler's town of Sanel. He estimated, from the number of assembly houses (five) which could have held about 100 people, usually only men, that there would have been about 1500 people living in the village (Powers [1976[1877]:169). A rancher, Mr. March, told Powers that in 1847, there were still 300-400 people in the Indian Village although at the time of Powers' visit, there were now only 150 **(**Patterson 1990:3; Powers 1976[1877]).

The typical Central Pomo village dwelling was a large, dome-shaped or oblong house constructed from willow poles typically covered with grass. One dwelling could contain 20 to 30 people, all related by blood (Powers 1976[1877]:168). Multiple families lived in each house, (McLendon and Oswalt 1978:276) so even if there were about 104 housepits, it was not necessary for all housepits to be contemporary for the village of Sanel to have contained the 1500 people cited in Powers' estimate (Powers [1976[1877]:169) and also by Stewart's informant Jeff Joaquin (Stewart 1943:45).

Houses were occupied during the rainy season. Once summer arrived, the families would disperse to "booths" or brush houses (Loeb 1926:159; Powers 1976[1877]:168).

Evidence of Ritual Activity

Within the Central Pomo ethnographic territory, and most of coastal California, are located petroglyphs, or cultural markings, on blueschist and greenschist boulders. The three main types of markings are Pecked Curvilinear Nucleated (PCN), cupules and incised lines. Within the HREC study area, both PCNs and cupules are known (See Table 1). The markings are thought to have resulted from ritual quarrying on the boulders and the resulting powder from the quarrying activity was probably removed for ceremonial use (Gillette 1998:102-104; Jones 2004:98-101). The two styles of markings are also thought to be of differing ages. Throughout the range of these cultural markings, the cupule is found superimposed on the PCN, where the two styles are found on the same boulder and not the reverse (Gillette 1998:100; Miller 1977:30-31). Those on the HREC could have been intermediate or primary destinations for the Pomo travelers.

Pomo Linguistics

The Pomo are not a unified political group, but a number of tribelets who speak one of seven related, but completely distinct languages. The name "Pomo" was designated by Barrett as a language group or stock, believed to be a member of the Hokan phylum of languages, one of the oldest in California. Although Barrett referred to

the languages as dialects, he was using the term "dialect" to mean a significant subdivision of the Pomo stock of languages. Each "dialect" was as different from each other as the various Romance languages of Europe (Barrett 1908:54). Languages of the Hokan phylum may have been more widespread, but are now found in widely separated regions. Other Hokan languages are Karuk, Shastan, Achumawi/Atsugewi and Yana in the north, Washo in eastern California, Salinan and Esselen in the Central Coast and Cochimi, and the Yuman and Seri languages of southeastern California, Baja California, Arizona and Mexico (Golla 2007: Figure 6.5).

The word "pomo" may be derived from Power's definition of "pomo" "people", derived from the Wintun word for "earth" (Powers 1976[1877]:147, 156), or, as recorded by George Gibbs on the Redick McKee expedition, as people living in the Northern Pomo village of Pomo (*pʰoˑ moˑ* , "at red earth hole"), or it may be derived from the Northern Pomo word *pʰoʔmaʔ*: those residing at a specific place (McLendon and Oswalt 1978:277). Today, the name Pomo is a general name for those people belonging to one of these language groups: the Southeast, Northeast, Eastern, Northern, Central and Southern Pomo and Southwestern (Kashaya) Pomo (Barrett 1908:119). The Pomo languages and territories were given these geographical names because the Pomo did not have their own names for the languages (Shipley 1978). The Kashaya Pomo are an exception. The name "Kashaya" may be an anglicized version of the Kashaya word for "agile" or "nimble", or it may be related to the Central Pomo term for "expert gamblers", or to the Southern Pomo term for "lightweight" (McLendon and Oswalt 1978:277).

According to the most accepted hypothesis of the origins of the Pomo (Golla 2007; Oswalt 1964), the Pomo language originated at Clear Lake about 2350-2500 years ago, spread north and west, with the Pomo arriving in the Russian River valley about 1500 years ago (Golla 2007:79). From an initial "proto-Pomo" language, four branches developed: Southeastern, Northeastern, Eastern, and Western. Western, the language of the Russian River area, in turn, has four branches: Northern, Central, Southern and Southwestern. The Western branch has a time depth based on linguistic evidence, of about 1500 years, which may also represent the dispersal of the proto-Pomo people themselves. The location of the proto-Pomo people before their language appeared at Clear Lake is not yet known (Fredrickson 1984:509).

Who occupied the southern North Coast Ranges before the arrival of the Pomo? Linguistic and archaeological evidence does not entirely agree, but it appears that the ancestors of the Yuki were probably the earliest or one of the earliest occupants of this area. Like the Chumash of the southern California coast, Yukian languages seem to have no other linguistic relations with other California languages. The Yuki language family is divided into two branches: Northern Yukian, with at least three dialects, and Wappo, spoken by people near Clear Lake. Linguists believe that Northern Yukian and Wappo diverged about 3000 years ago. If the Pomoan people arrived in the Clear Lake Basin before 5000 years ago, and began their migration and the differentiation of their languages between 5000 and 3000 years ago, this could account for the split between Northern Yuki and Wappo, however, Western Pomo began to differentiate around 1500 years ago, which does not fit the Yukian evidence very well. Yuki and Pomo appear to

have been in contact for a long time. Both languages have borrowed words from the other, some from before the linguistic splits and some after (Fredrickson 1984:509-511; Golla 2007: 79, 81).

European Contact

Many voyages of discovery to the western coast of North America were undertaken in the 15th and 16th century, before California was colonized by the Spanish. Many explorers were searching for the Strait of Ainán, also known as the Northwest Passage. In the case of the Spanish, they were also searching for good harbors for the Manila Galleons, and for the fabled city of Quivira. One of the earliest explorers was Juan Rodriguez Cabrillo, whose expedition, probably reached the Klamath River, following his death in the Channel Islands. Sir Francis Drake made landfall somewhere near Marin County in 1579, and he claimed the area as Nova Albion for England. Others followed: Cavendish in 1586-1587, Vizcaíno in 1602-1603, Pedro de Unamuno in 1587, and Cermeño in 1695. Vizcaíno's expedition made landfall at Monterey in 1602, and the joint venture of Gaspar de Portolà and Junípero Serra claimed California for Spain at the same cove in 1769 (Chapman 1921, Eldridge 1914; Engstrand 1995).

European conquest of California began before the Spanish arrived. Diseases for which the California Indians had no immunity were carried along trade routes. The Spanish brought animals that spread annual grass seed and weeds in their dung (Preston 1998). The missions, pueblos and presidios spread as well, with the dual goal of

protecting the silver mines of northern Mexico from foreign incursion and Christianizing the Native Californians, teaching them crafts and farming, and transforming them into Spanish citizens (Gutiérrez 1998; Hackel 1998). Franciscan missionaries established San Rafael in 1817 and San Francisco Solano in 1823 in the North Bay regions, actively recruiting Miwok, Patwin and Pomo people (McCarthy et al. 1985).

In the north, the Russian-American Fur Trading Company negotiated with the Kashaya Pomo for the land at Fort Ross and built a fort in 1812. The purpose was at least two-fold: establish a southern base for the sea otter skin trade, and provide fresh produce for the Alaskan colony. The Russians were interested in the Kashaya more as laborers than as converts to Russian Orthodoxy, so the Kashaya – Russian relations were probably more benign than those at the Spanish missions. The Russian venture was not as profitable as they would have liked, and so Fort Ross was sold to John Sutter in 1841 (Lightfoot 2005; Pittman 1995).

After Mexican Independence in 1822, the Mexican government instituted policies of land reform. This was the beginning of the end of the mission system. Three laws were passed. The first two, the Colonization Act of 1824, and the Supplemental Regulations of 1828 did much to increase the influx of foreigners to California, but the Secularization Act of 1833 allowed, for the first time, grants to private individuals of former mission land (Hackel 1998:136; Robinson 1979:56-57). Before Mexican Independence, the Spanish viceroy had awarded less than 30 land grants, mostly to retired soldiers. After 1833, however, the governors awarded land to over 700 petitioners. Most of these grants were made after 1840 (Hackel 1998). At least 346 claims were made to people of non-

Mexican origin (Gates 1971:410). In some cases there was not enough time for the full process of grant approval to take place before the U.S.-Mexican War, and as of 1848 and the treaty of Guadalupe Hidalgo, many grants were still invalid under Mexican Law. The Treaty of Guadalupe Hidalgo ensured that California landowners would retain title to their property as under Mexican law and that they could accept American citizenship. The U.S. Congress passed the Land Act of 1851 to provide for confirming Mexican and Spanish land grants by a three person Commission. Grantees who could not provide proper paperwork or could not "document" their property through more shady means lost their land (Gates 1971). A.O. Carpenter wrote that the process of sorting out the land grants was burdensome in other counties but that in Mendocino County, there were only three grants and probably two were invalid (Carpenter and Millberry 1914:123). Two of the grants, Rancho Yokaio and Rancho Sanel, were confirmed in court.

Fernando Féliz, grantee of the Novata Rancho in Marin County, arrived in Sanel in 1844, after being awarded about 4 leagues of land (or roughly 17,700 acres) in the Sanel Valley by Governor Manuel Micheltorena. Rancho de Sanel was named for the Indian village in the valley. Féliz and his workers built an adobe house near the village and it remained standing until 1874. Féliz's grant was finally confirmed in a U.S. District Court in 1856. Féliz was able to patent his land with the help of San Francisco attorney John Knight. One story says that Féliz stood at the top of Duncan's Peak, and all the land he could see was part of the grant (Mendocino County Book of Maps 2:171). For his part in the successful confirmation of Féliz's grant, Féliz gave Knight a league of land (or possibly only 1,000 acres) in the northern part of the grant, which is known as Knights

Valley. As of 1914, Knight's land belonged to the Crawford family. Other nearby landowners included the Henrys, McGlashans, McNabs, Parsons, and a few other small holdings (Carpenter and Millberry 1914: 89, 193). Féliz also sold his land to his sons, daughter's husbands, and others who settled in the area.

American Relations

Salvador and Juan Antonio Vallejo, younger brothers of General Mariano Vallejo, also received a grant in 1844 from Governor Micheltorena. This grant, Rancho Lupyomi, was located in the northern Clear Lake Basin. In 1847, Salvador Vallejo sold Rancho Lupyomi to Andrew Kelsey and Charles Stone and a couple other men, (probably Benjamin Kelsey and a man named Shirland). According to chroniclers of the massacre that followed, Salvador Vallejo had been a harsh owner, but the Kelseys and Stone were even more brutal, with accounts of beating, starving, killing and raping their workers (Barrett 1952:408; Carpenter and Millberry 1914:125; Heizer 1974:246-247; Hoover et al. 2002:143-144; Owens 1977:18-19; Palmer 1881; Parsell 2002[1940]; Patterson 1990; Radin and Benson 1932). The various accounts of the events leading to the murder of Andrew Kelsey and Charles Stone differ by the inciting events, the individuals involved, and the number of Pomo killed in ensuing massacres by American soldiers. Some of the stories relate the extreme cruelty, starvation, and the rape of Pomo women as the primary cause, and at least two other accounts also include a story of the goldfields.

In 1848, John Marshall found gold in the streambed of the American River where he was building a water mill (Hagwood 1981:4). This was an event that was impossible to hide for long and within a year, thousands of people rushed to the goldfields of California, intent on finding fortunes along the rivers of the Sierra Nevada. The Kelseys were among those who went to seek their fortunes. In 1849, the Kesley brothers forced 50 Pomo men to accompany them to mines either near Red Bluff, or in the Sierra Nevada (depending upon the account) to labor for them. According to Thomas Knight (Heizer 1974), once the Kelseys found the mines were a dud, they abandoned the Indians there in hostile territory, having sold the Indians' food to the miners. Exposed to malaria, starving, and stranded among Indians hostile to them, only a few men survived to return. Some accounts say only one or two men returned. Others said there were eight or ten (Carpenter and Millberry 1914:127; Heizer 1974:246-247). After this incident, the survivors and other Pomo workers organized to kill Kelsey and Stone and end the abuses. Kelsey and Stone were ambushed at their house and shot to death with arrows (Barrett 1952:408-409).

The following spring of 1850, a militia under the command of Brevet Captain Nathaniel Lyon (Barrett 1952:410-412; Heizer and Almquist 1971:27-28; Heizer 1974:244-245) retaliated for the killings of Stone and Kelsey with indiscriminate attacks against the Pomo in both the upper Clear Lake region and the Russian River areas. By his own estimates, Lyon killed at least 60 Indians on "Bloody Island" (Bonopoti) in Clear Lake, and another 75 "Yokaiaks" on an island in the Russian River near present day Ukiah. Lyon then dispatched a cavalry unit to Féliz's rancho, ten miles south, for "action" against the Indians living on the rancho. Féliz is said to have alerted his workers

to the approaching army, and many escaped to hide behind Duncan's Peak (*sii'nol*) for several weeks. Lyon's report indicates that the Indians at Sanel had fled, and had nothing to do with the murders anyway (Heizer 1974:245; Patterson 1990).

After these events, some settlers recognized an opportunity to make money by rounding up the stray longhorns that had belonged to Kelsey and Stone. Several groups rounded up thousands of these cattle in Big Valley and the mountains to the west, to ship to market. According to Mauldin, Ben Moore was one of a group of six men who were rounding up the longhorn cattle remaining on the Kelsey Ranch. They found fewer cattle than expected, and noticed horse tracks going over the mountain towards Sanel Ranch. Apparently the Sanel Rancho vaqueros had beaten them to most of the unowned longhorns. On a moonlight night, with Indian guides, the group went over the mountain on the trail and brought back all the cattle Sanel Rancho had corralled. At noon the next day, the Sanel Rancho noticed the loss of its cattle and gave chase. The leader of the six-man expedition, J. Boone Smith rode behind the cattle and once in the Scott Creek drainage, he set fire to the chaparral, driving back his pursuers. It was the sale of his share of this herd of cattle that got Ben Moore in trouble (Mauldin 1968:73-74). This is one of the early descriptions of the use of a trail between Big Valley at Clear Lake and Sanel on the Russian River.

Also in 1850, after California achieved statehood, President Millard Fillmore appointed three men as Indian Commissioners authorized to deal with the escalating violence between settlers and Indians. The commissioners' instructions and

appropriations changed twice in 1851. Then, later in 1851, they were authorized to act as agents of the U.S. government to negotiate treaties with the Indians of California. Given little or conflicting instructions by Washington and realizing the depth of government and settler hostility towards the Indians, the three men, Redick McKee, O.M. Wozencraft and George Barbour, decided to split the state into three territories and work separately, to speed up the negotiation process. Redick McKee became the northern commissioner (Hoopes 1970:198-200). Hearing of the massacres of 1850, the commissioners decided that travel was not safe without a military escort.

George Gibbs chronicled Commissioner Redick McKee's 1851 journeys in Northern California. Having arrived in Sanel on August 16, 1851, the McKee party stayed at the Féliz residence at Rancho de Sanel. The next morning they left for Clear Lake, riding on mules, "to save the horses". McKee was accompanied over the Mayacmas Mountains by a party of nine dragoons under Major W.W. Wessells, George Gibbs as the translator, a pack train and a few local men on a hunting expedition to Clear Lake (Gibbs 1972[1852]:6-7). There, at Camp Lupiyuma on August 20, 1851, McKee signed a treaty of "Peace and Friendship" (Hoover et al. 2002) with eight local Pomo tribes. Heizer's annotations of the Gibbs journal listed the Pomoan signatories of "Treaty O" as the Kulanapo, Habenapo, Danoxa, Moalkai, Shigom and Shanel (Gibbs 1972[1852]: Endnote 12). In exchange for the land they currently occupied, the signatory tribes would gather in the upper Clear Lake area and be provided for by agents of the U.S. Government. Gibbs wrote of the trip to Clear Lake over the Mayacmas Mountains and the return on Wednesday, August 20th:

> Sunday, August 17th….The men were mounted on mules to save the horses, as the road was a severe one…. Our road after leaving the valley was an almost uninterrupted ascent to the summit of the great range which bounds the valley of the lake on the west, the path being an Indian trail, distinctly enough marked. … Just before reaching the summit, we entered a pretty little valley, two or three miles in length, and completely circled in the mountain, containing fine grass. Passing the divide, we came upon a steep descent ending in an abrupt pitch into the cañon of an arroya below, down which was a well-worn path, probably the equal labor of Indians and bears, guarded on either side by a thicket. Here was our almost entire descent to the level of the valley, which is probably not less than a thousand feet above that of Russian river. We wound down the arroya, now dry except in spots, and passing to the right of a couple of small tulé ponds, crossed some low hills into Clear Lake valley, towards its head. … The march to-day was estimated at fifteen miles (Gibbs 1972 [1852]:105-106).

> We started on the return route about half past twelve, and reached the top of the mountain in four hours. The afternoon was fine and we here enjoyed a magnificent view of the country and lake behind us. Some of the party left the trail by which we came up, at the head of the little valley, and descended by one leading to the left. An hour and a half of rapid travel brought us to Féliz's, where we learned that the camp had been moved up a mile and a half further for better grass. We reached it a little after dark, and found that the rest had already arrived. Gibbs 1972[1852]:111).

Gibb's account is the most descriptive account of a trail over the Mayacmas Mountains. The "pretty little valley" is a fit description for Benmore Valley, situated near the crest of the mountains. Gibb's account also highlighted two routes to the west from the head of Benmore Valley.

Earlier in 1851, the Alcalde of Sonoma, Peter Campbell, had granted a league of land, located on the northeastern side of Féliz's rancho, to the Shokawa (Patterson 1990:4, quoting Heizer 1974:187-188). After signing the McKee treaty, the Shokawa would have had to move to the Clear Lake Basin and abandon this land, but the treaty was never ratified. Settlers wanted the land occupied by the Pomo, and the land that McKee promised to the eight tribelets was quickly occupied. Many Pomo were removed

from their ancestral land to live at either the Mendocino Reservation near Fort Bragg (1855-1864), or the Round Valley Reservation, established in 1856 as the Nome Cult Farm. When the Mendocino Reservation was closed in 1864, its residents were moved to the Round Valley Reservation. Some Pomo fled into the hills or lived on ranches in exchange for their labor. Still others banded together to buy their own land back, as happened at the Yokayo Rancheria (Owens 1977). Many Pomo were agricultural laborers, picking grapes, hops, pears, and harvesting grain (Bean and Theodoratus 1978:299). Like many other people who followed the crops, Pomo workers migrated to seasonal jobs, sometimes camping near the fields or along the river (Hawk 2006:6, 11, 24,26).

Sanel, Hopland, and Transportation

The town of Sanel grew up in the place of the Sanel Rancho. The first business was a saloon established in 1859 by a man named Connor, and it was soon joined by a store (Carpenter and Millberry 1914:89; Patterson 1990:11). In 1874, when the toll road from Cloverdale to Ukiah opened on the east side of the river, the town moved to that side of the river to take advantage of the road. Then, in 1886 the rail line was extended from Cloverdale to Ukiah on the west side of the river, and the town moved to the west side once again. The two post offices were combined into one at the old Sanel location, now called Hopland, and today, the town on the east side of the river is named Old Hopland. Carpenter described the new town of Hopland as a bustling place with schools, hotels, stores, a blacksmith, ice cream parlors and three churches. In 1914, most of the

valley farmland was in hops or alfalfa, with orchards of pears and prunes, and the hillsides were used for grazing or growing grain (Carpenter and Millberry 1914:90).

The San Francisco and Northern Pacific Railroad (SF&NP) reached Cloverdale in 1872. The Cloverdale and Ukiah Railroad, an extension of the SF&NP line, reached Ukiah in 1886, and the first railroad service in Ukiah started in 1889. Mauldin reported that the mail was packed by trail from Hopland to Clear Lake until the railroad line reached Ukiah (Mauldin 1956:6747). After several mergers, the SF&NP became the Northwest Pacific Railroad (NWP), which merged with the Southern Pacific (SP) in 1992, and the Southern Pacific merged with the Union Pacific in 1996. The railroad made it possible to ship agricultural products from Mendocino County to the San Francisco Bay area.

At the same time as the northerly advance of the railroad, the industry of Lake County began to diversify from small scale farming to mining and the attraction of mineral and hot spring resorts. In 1864, borax was being produced at Clear Lake at the Sulfur Bank Mine, the first borax mine in the United States. Sulfur was subsequently mined in 1865, and quicksilver mines as of 1873 (Hoover et al. 2002:145; Simoons 1953:363). Lake County is known for its mineral springs, and hot spring resorts such as Harbin Hot Springs and Anderson Springs, became very popular by the 1870s. Despite the hopes of the County of Lake Supervisors, the railroads found that it was not cost effective to bring a rail line to Lake County (County of Lake Supervisors 1888). Until the 1860s, the main mode of transportation to Lake County from Mendocino County was

by horseback. One of the first roads, the Dodson Toll Road, was completed in 1865. It joined Big Valley to Cloverdale (Simoons 1953:364). Apparently, this was the route used to ship freight from Kelseyville to the San Francisco and Northern Pacific Railroad line in Cloverdale (Lake County Supervisors 1888).

Col. Fred Long hired Prof. Kelly of Lakeport to survey another road from Lakeport to Hopland. The route of the Long Toll Road followed Scotts Creek from Lakeport to Glen Alpine, a stage stop where the stage horses were changed. It was completed in 1890. Before this road was built, the most popular road from Hopland to Big Valley was the old Indian trail that passed up Parsons Creek to Benmore Valley. The old trail was the route of mail delivery between Hopland and Lakeport, with the mail being packed over the mountains on horseback. Once the Long Toll Road was built, however, a wagon could make the journey (Carpenter and Millberry 1914:146; Mauldin 1956:6747-6748).

Toll roads were not very popular with the teamsters or the local people. They traveled on the toll road and then tried to avoid the toll houses. After some agitation, some roads were converted to "free roads". In 1896, the Blue Lakes Toll Road to Ukiah was made free and eventually became the route of State Highway 20. The Long Toll Road was purchased by the County of Lake in 1899 and converted to a free road. It was known as Route 16 and later as Highway 175, a winding road through chaparral, and unfit for vehicles over 39 feet in length (Caltrans 2007; Mauldin 1956:6748; Simoons 1953:364)

The Hopland Rancheria

From about 1853 to 1908, the Old Hopland Indian Rancheria was on land just to the east of the Russian River, at a place called "Apple Tree Village" (CA-MEN-866/H), variously owned by John M. or Jane E. Peck, possibly Duarte (a friend of Fernando Féliz's), or Joseph Knox. Apparently the land changed hands often, but was sold to A.W. Foster in 1890. Nancy French was unable to find mention of the Indian village on the property (French 1990:11-12), and also unable to find a later deed showing ownership of land by the Catholic Church, although Barrett mentions a school at the old Rancheria operated "under the auspices of the Catholic Church" (Barrett 1908:168). *Kaletslu* may be the Pomo name for Apple Tree Village, as it is mentioned by Stewart as being the second village occupied after Sanel, when the Spanish forced them from their lands (Stewart 1943:45). Stewart labeled this place "site 31" on his 1943 map (see Figure 5). The village site *Katabel* is probably the site located in the northeast part of Féliz's rancho that was granted to the Shokawa in 1851 (Patterson 1990:5), and occupied before *Kaletslu*. A cemetery was located uphill from Apple Tree Village. It was probably last used in 1908 (CA-MEN-2308/H). It is believed that this village was the site of the 1870 Ghost Dance (Patterson 1990:6). 1870 also marked the arrival of missionaries. The Catholic missionary priest, probably, Fr. Luciano Osuna, stopped at Hopland, and the Methodist missionary continued to the Round Valley Reservation to establish a church there (Patterson 1990:8).

In 1880, Lyman Palmer said there were 20 thatched houses and about 150 people living in a village north of Sanel (Palmer 1880:173). As of 1903, when S.A. Barrett was conducting his fieldwork, the Hopland Indians were living on A.W. Foster's land. Barrett reported there were 16 houses, a school run by the Catholic Church, and about 100 people living on this land (Barrett 1908:168). In about 1904, when he made plans to sell the land, A.W. Foster evicted the Shokawa. After their eviction, the Shokawa lived across the road by the Russian River in a series of camps (a hundred people or so) until the Bureau of Indian Affairs purchased the land for the new (Current) Rancheria from the Daw family. The Shokawa dismantled their houses at Apple Tree village, and stored the wood until they were able to rebuild their houses on the current Rancheria (Shawn Pady pers. com. November 2010).

According to oral history, Mr. Daw was convinced by Captain Tac of the Hopland tribe, to sell the land. Others think Foster convinced the Daws to sell. In any case, the land had no water, and the new Indian owners built a road and ran pipes up to a spring near Eagle Rock. Each house in the Rancheria had an outdoor spigot for their fresh water (Shawn Pady pers. com. November 2010). The 100th anniversary of Hopland Rancheria was celebrated in 2007.

History of the HREC: The Pratt Ranch and Poor Family

In November 2010, John Poor, patriarch of the Poor family, spoke about growing up in the hills above Hopland, giving details about his family, his neighbors and the Pratt Ranch, where he worked for many years. John Poor's grandfather, also named John, came to California from Massachusetts in 1887 and homesteaded the Poor Ranch. After acquiring the land, John's grandfather went back to Massachusetts to bring his family to the ranch. John's father, George, was four years old at the time. John Poor was 87 years old at the time of our meeting, and he lives alone in the original ranch house built in 1888-1889.

John's grandfather had to clear a lot of brush from the ranch. There was a pond on the property which the Poors drained and used as a garden. John said the Poor property is in a very good location. Parsons Creek runs through the property, and the houses are located in a local banana belt: below where snow is likely to fall and above the valley fog. Cold air settles below the ranch in the area of the HREC headquarters. John Poor's grandfather started the first vineyard on the property and the Poors continue to grow grapes today.

Roy L. Pratt, vice president of Del Monte Foods, wanted a place to hunt, ride and relax on the weekends. Pratt bought the Duncan Ranch, east of Hopland and west of the Poor Ranch. Over the next few years, Pratt also bought out some of the homesteaders who lived nearby. Some of these people may have been homesteaders, renters or

squatters. Mr. Poor was not sure. The first purchases were in 1931. A subsequent visit to the Mendocino County Assessors Office confirmed that several names mentioned by John Poor sold land to Mr. Pratt between the years 1934 and 1943, including John Poor's father George (Mendocino County Assessors Office Book of Deeds). The names of some of these early settlers are still present in some of the pasture names at the HREC: James, Vassar and Niederost.

John Poor received his education at several local schools, including two years at the Hopland Indian School, where his mother taught. He also attended the McDowell Valley School and Hopland School. When the Peters family lived in Benmore Valley, John used to catch a ride on horseback with the Peters kids to go to school in McDowell Valley. Otherwise, he would have had to walk. In 1938, when John was 15, he started working on the Pratt Ranch part time doing chores. He continued working on the ranch when it changed hands in 1951 and became part of the University of California. He has been retired from the University of California for 40 years. John's grandsons, Troy and Steven, now work for the HREC.

John Poor's Recollection of Roads and Trails

John Poor said that over the years, there were a number of roads to the Poor Ranch. A main road existed, connecting all the homesteads. Another road, connecting to the main road, came from up the hill, along upper Riley Ridge, and then to the Private Hunting Club, which was a private residence at the time. This road circled around to the

west through Maude's Glade pasture, to go past several other settler home sites now part of the HREC. This road was graded for wagons and horses, and is still in use as an unpaved access road to the several pastures in the north part of the HREC. The original trail would have been too steep for a team of horses and a wagon. A later road came up from below, at what is now University Drive, but circled around counterclockwise to the right, forded Parsons Creek near the Poor ranch houses, and ended in front of the main Poor Ranch house. The current main road is a turnoff from University Drive, which connected to the Eastside River Road out of Hopland (John Poor pers. com. November 2010).

During the late 1800s and early-mid 1900s there were many more people living on homesteads and small ranches within the mountains than there are today. Every cabin had access to a road and a spring for fresh water, since most were not near a perennial stream. John Poor and his family knew the other settlers. He mentioned families who had children his age with whom he attended school. Children used to walk from house to house and no one worried about mountain lions or other wild animals because there were so many houses and so many people.

Several cabin sites are present on the HREC property, although in most cases, the only remains are nails and pieces of metal, ceramic or glass. None of these sites has been excavated and most have not been archaeologically recorded. Why were there no cabins at most of these locations? When Roy Pratt bought individual properties to add to his holdings, the structures were removed and rebuilt elsewhere. There was universal

agreement among the people I spoke with that the wood from a structure had value and was collected for reuse.

When the Shokawa had to leave Apple Tree Village, they dismantled their houses and stored the wood until they could rebuild. John Poor recounted what happened to the cabin of a neighbor, Bob Sullivan who lived along Parsons Creek, northwest of the HREC Headquarters. Sullivan died when John Poor was seven years old. His father, George Poor, moved the cabin to the Poor's sheep corral, where it is today (John Poor pers. com. November 2010). Steven believed that his great-grandfather must have bought the site of the James Cabin and the Sullivan Cabin and sold this land to Roy Pratt, but took the cabins for building materials (Steven Poor pers. com. February 2011). I visited the Sullivan cabin with Steven Poor. It is a small, end gabled, vertical board and batten structure, with a corrugated metal roof, a small window on each side, and a door.

In another conversation, Steven Poor and Robert Keiffer of the HREC described a horse trail used by people in Hopland to go to the residences. The trail came from Old Hopland, through the old Indian Rancheria, past the Indian cemetery, and crossed a fork of Parsons Creek at the place called Packsaddle Crossing. The trail forks at Packsaddle Crossing. One fork of the trail descends gradually to the southeast to the Poor Ranch. The other fork continued climbing to a small meadow where the horse trail forked again. One branch climbed to 11 o'clock Point, where the horses were rested. The other branch ascended north to Kelsey Cabin (Steven Poor and Robert Keiffer, pers. com. February 2011).

The Pomo had another route of travel through the mountains. John said his father, George, remembered sitting on the front porch of the farmhouse, facing east, watching the Indians walking past and some would wave at him. The walkers were both men and women. The women carried baskets and the men carried canes or sticks. John Poor was sure the people his father saw were coming from Lakeport, and from Hopland. He was told the trail came downhill along the power pole line above the Poor ranch, avoiding the Private Hunting Club, and then downhill to where the HREC headquarters is now, along Parsons Creek. He didn't know where they went after that. John Poor also said the Indian travelers did not go near the Private Hunting Club east of the HREC, which is connected by dirt roads to Benmore Valley.

The area around the sag ponds at University Road, as described in the chapter on previous archaeological work at the HREC, was excavated in the early 2000s and might have been an ideal campsite for passing travelers. A number of artifacts including projectile points of obsidian and chert, groundstone and net sinkers were found there. When questioned about the site as a possible Indian camp in the historic era, John Poor didn't think that was likely. There were lots of houses there. Spanish wood cutters lived in cabins next to the ponds in tents on raised wooden platforms, and the Spanish didn't get along well with the Indians.

The Indians from Clear Lake and Hopland knew each other and referred to each other by a nickname. They seemed to be on good terms. Mr. Poor told us that the men

carried sticks or canes to kill the rattlesnakes and the women carried everything else. He knew of no nearby camps that the Indians used. However, they occasionally stopped on the Poor Ranch to visit the medicine spring across the creek from the farmhouse. His grandfather put in a trough at the spring to catch the water, which runs very slowly, estimated at about a gallon in 24 hours today, but the trough rotted away. John Poor replaced it, and put in gravel and a springbox, but the hillside gave way, and now one can see only the pipe from the spring that empties into a new trough. John Poor's father's account of the Indian travelers described a route down Riley Ridge and then along Parsons Creek to some unknown destination. At the time that John's father was a boy, one possible destination on this route was Apple Tree Village, just west, over a low hill from the Duncan Ranch (John Poor pers. com. November 2010).

Photo 2: Medicine Spring trough at the Poor Ranch. The springbox is located under a landslide in the upper right in this picture.

John Poor's father's tale verifies that there were two, possibly three routes across the HREC. There may have always been multiple paths and destinations for the travelers

as well as places to stop in between. In historic times, three of the destinations may have been the main Shokawa village sites just below the HREC, and also two locations for the town of Hopland: the original *Sanel*, a site on a corner of Féliz's property given to the Shokawa by the Alcalde of Sonoma, Apple Tree Village, and also the towns of Old Hopland and Hopland. Destinations north of Hopland would have been accessible from the trail as well.

Henry Mauldin's Visit to Benmore Valley

In 1951, Henry Mauldin, historian from Lake County, recorded the reminiscence of Francisco John, who lived at Big Valley Rancheria. According to Mauldin, when Francisco John was a young man, he walked the trail taken by McKee in 1851. From this interview Mauldin wrote:

> From the forks of north and south branches of Scotts Creek, this group of Indians went about one mile up the South Fork of Scotts Creek to where there was an old apple orchard. They went a couple of miles toward Benmoore [sic] Valley and stopped at an old Indian camp site and cooked their dinner. Then up and over the mountains, going through Benmoore Valley and coming out at a Rancheria about two miles north of Old Hopland, near the Russian River. The trail was good and plenty of room, single file, when going thru [sic] brush or under larger vegetation. (Mauldin 1951:1533-1534)

The event described in this account probably happened before 1904, and the Rancheria that is mentioned is probably Apple Tree Village, because its location fits the description. The present Rancheria is just off Highway 175 just north of McDowell Valley. In 1904 landowner A.W. Foster evicted the Shokawa from the old rancheria at Apple Tree Village because he was selling the land.

In his writings from 1956, Mauldin recounted walking the trail described by Francisco John from the old Poor place, but it appears Mauldin was interested in the section of the trail in Lake County only, and did not follow it westward from the Poor Ranch (Mauldin 1956:2351-2352). Mauldin wrote the following narrative about the trail:

> It is believed that the trail came up from a point about ½ mile west of that location. From this starting point at about 39º 0' 42", -123º 2'45", in [sic] went over a rounding divide at the present P.G.&E electric line at about 39º 0'53" -123º 2' 46 and followed down a small unnamed stream whose mouth is at 39º 1'22" -123º 2' 20". At this degree reading it left and went east over a small ridge at 39º 1' 20' -123º 2' 15" and then faded out into the valley lands. Evidence of an Indian site was looked for in the lower end of the valley but none could be found. (Mauldin 1956:2351)

On another occasion, Mauldin gave another description of the trail route. "The old Indian trail came up from the Russian River, through the Pratt Ranch, near the lower barn of the Benmoore [sic] Valley Ranch at 39º1'12'' N 123º 2'5" W, up the valley, then left it at about 39º 0'35"N 123º0'45"W to go directly east over the ridge at the same place the electric line now goes" (Mauldin 1956:2332). Again in 1956, Mauldin wrote an article about trails and roads and Benmore Valley. He claimed that this route, "up the South Fork of Scott Creek, over the mountain by Benmore Valley, down to the valley lands two miles north of Hopland" was the most popular of four trails through the Mayacmas Mountains.

In 1950, the University of California Regents decided to establish field stations throughout California, to conduct research in conservation and agriculture. They investigated Mendocino County as a possible location for a field station in the northwest

part of the state. In 1951, Roy L. Pratt sold his 4,630 acre ranch to the University of California for the creation of the Hopland Research and Extension Center (HREC 2009b), now one of nine centers across the state. Included in the sale were the various farm buildings, equipment and 1,135 head of sheep. A land transfer from the BLM in the 1960s brought the research station to 5,358 acres (Murphy and Timm 2003:*v)*. HREC workers now occupy the ranch houses, and a dormitory facility is available for visiting researchers. Old roads to the homesteads are now the access roads for the HREC pastures. Since its founding, the HREC has been the field site for over a thousand investigations. A search on the HREC website shows 46 projects ongoing at this time (HREC 2010b). The HREC involved in a restoration project funded by the California Department of Fish and Game, for Parsons Creek, which supports a steelhead population. The HREC plans to build a facility to enhance community involvement and education, and to offer classroom space for nearby educators to provide hands-on activities for local students (HREC 2010a).

From Pomo villages to Ranchos and cattle, to hops, railroads, towns and vineyards, the story of southern Mendocino County is a story of change, appropriation and reuse. The patterns of settlement have changed but the history of the landscape remains in the memories of the people who live here.

Chapter 8: Background Research and Survey

Evidence from Historical Accounts and Maps

GLO Plat Maps

GLO Plat Maps from the late 1800s for Townships T14N R11W and T13N R11W were examined to locate trail and roads that were recorded by surveyors. The maps were incomplete in their earliest versions because not all of the township land had been surveyed, but a trail running the length of Benmore Valley was indicated in Sections 1 and 2 of T13N R11W GLO Plat map of 1874. A small section of the same trail was noted in Section 35 of T14N R11W GLO Plat Map of 1875. By 1896, the Hopland to Lakeport trail was shown skirting the bottom sections of T14N R11W and the top sections of T13N R11W, as shown in Figures 8a and 8b below.

Several features of these two plat maps must be highlighted and explained. First, the two maps are from different years and represent the work of different surveyors. Second, both names, "Hopland" and "Sanel", were in use during the same time period as the town moved back and forth across the river to take advantage of the toll road from Ukiah to Cloverdale on the east side of the Russian River, and then the railroad, so it is not surprising that the trail name changes over time. The route of the trail from Hopland to Lakeport as shown on these maps is an unpaved access road for HREC employees and researchers. Third, the "Trail from Sanel (Hopland) to Lakeport" in Figures 8a and 8b is indicated as a dotted line until it reaches J.M. Kelsey's Cabin, and then it is indicated by a double solid line. The surveyors recorded a road. It also has a new name: "Kelsey to

Lakeport". Fourth, the 1896 GLO Plat map for Township T14N R11W has a remnant trail segment in Section 35. It is most clearly visible on the 1875 map in Figure 9 below. This short segment was also located during the survey and is a dirt road along a tributary to Benmore Creek.

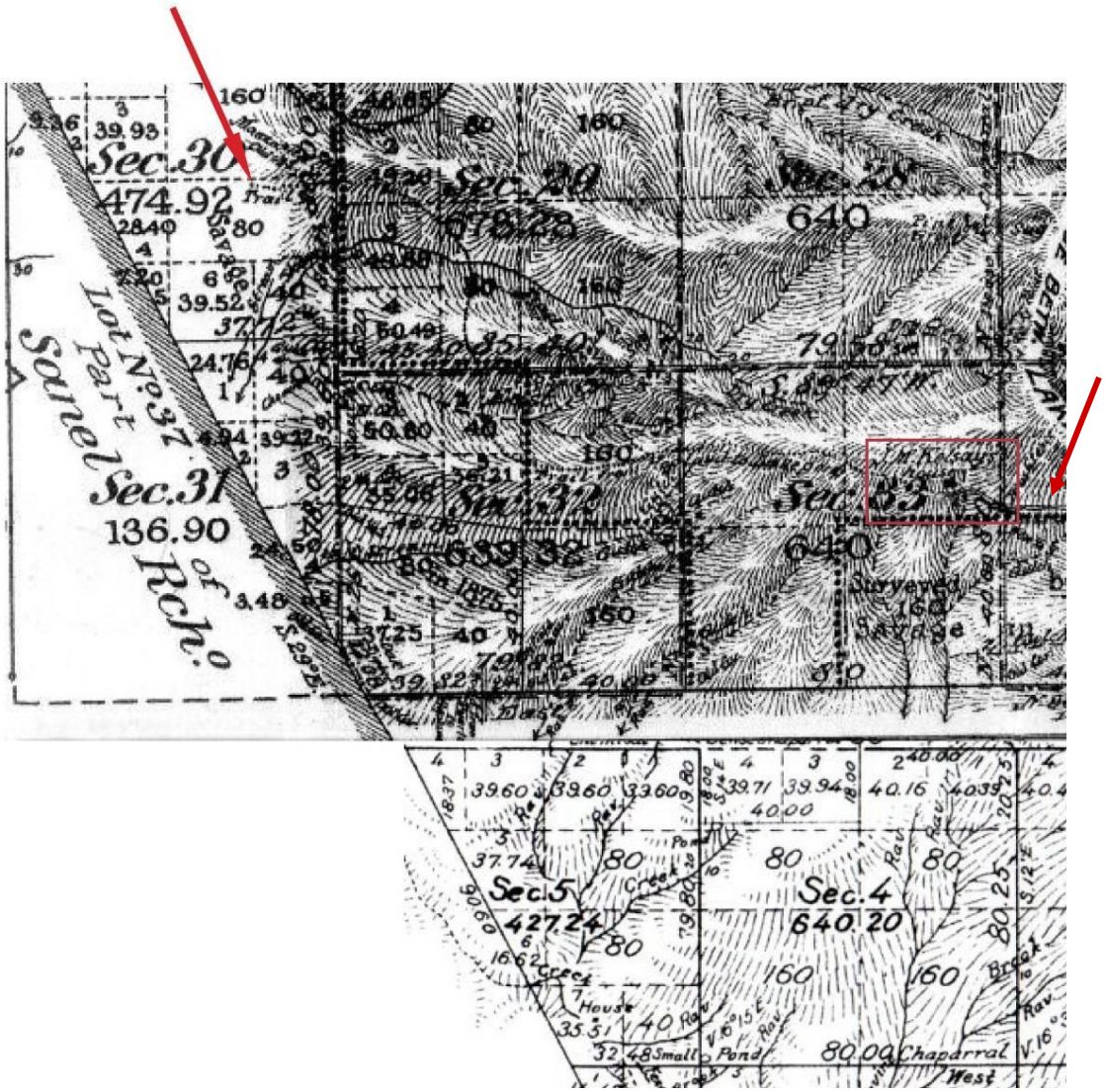

Figure 8a: West half of T13N R11W (1889) and T14N R11W (1895). The "Trail from Hopland to Lakeport" on two GLO Plat Maps. The lower sections of Township T14N R11W (1896) are aligned with the top sections of Township T13N R11W (1889). The west end of the trail and Kelsey's Cabin are shown in red.

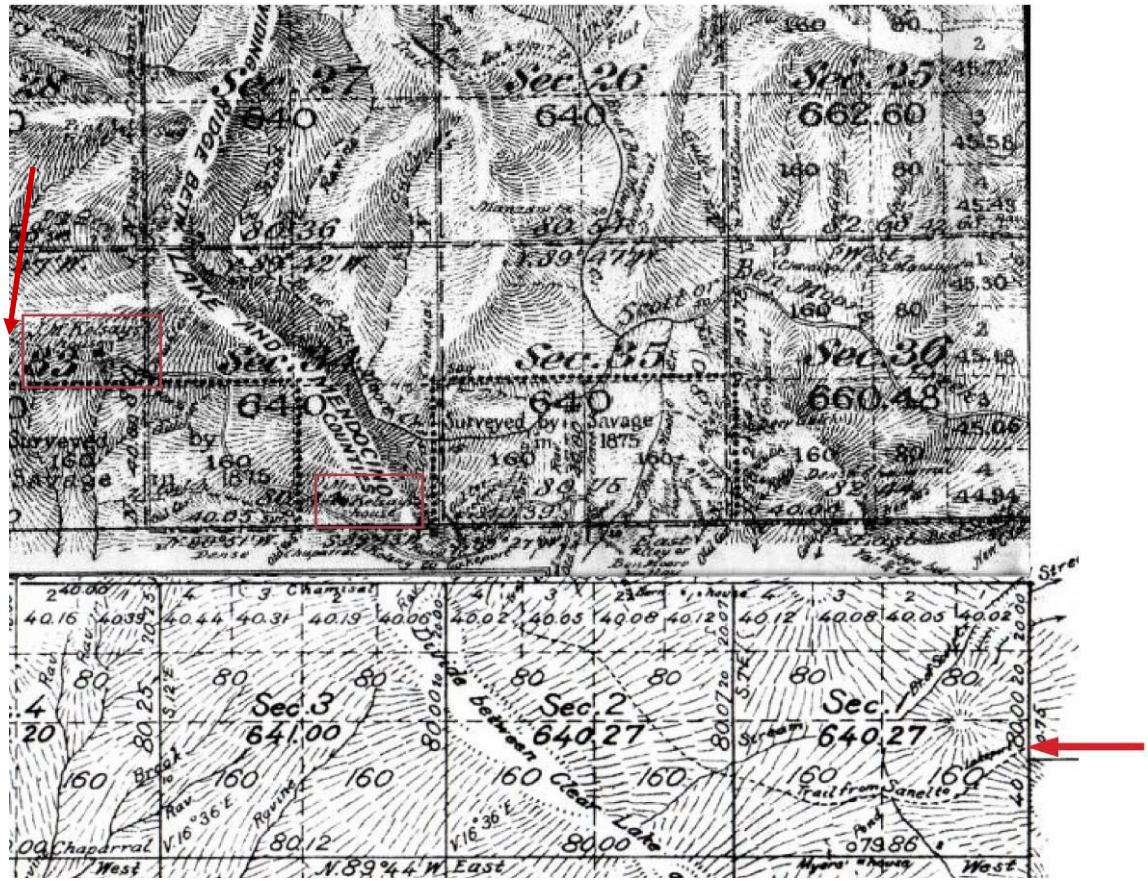

Figure8b: East half of T13N R11W (1889) and T14N R11W (1895). The "Trail from Sanel to Lakeport", or "Road from Kelsey to Lakeport". Compare the representation of the trail as a "road" in this figure, with the dotted line to J.M. Kelsey's Cabin in Figure 8a. Sections 1 and 2 of T13N R11W are in Benmore Valley.

Henry Mauldin's Visit to Benmore Valley

As part of this study, I reviewed Henry Mauldin's accounts of the Trail from Hopland to Lakeport, and his visit to Benmore Valley to locate it. In 1951, Henry Mauldin interviewed Francisco John of Big Valley. Mr. John told Mauldin that he had walked from Big Valley to Hopland as a young man (Mauldin 1951:1533-1534). In another narrative, Mauldin stated that the trail came up from the Russian River, through

the Pratt Ranch, to the Lower Barn of the Benmore Valley Ranch, continuing eastward directly over the ridge at the electric pole line (M10, see Table 3 and Figure 11) (Mauldin 1956:2332).

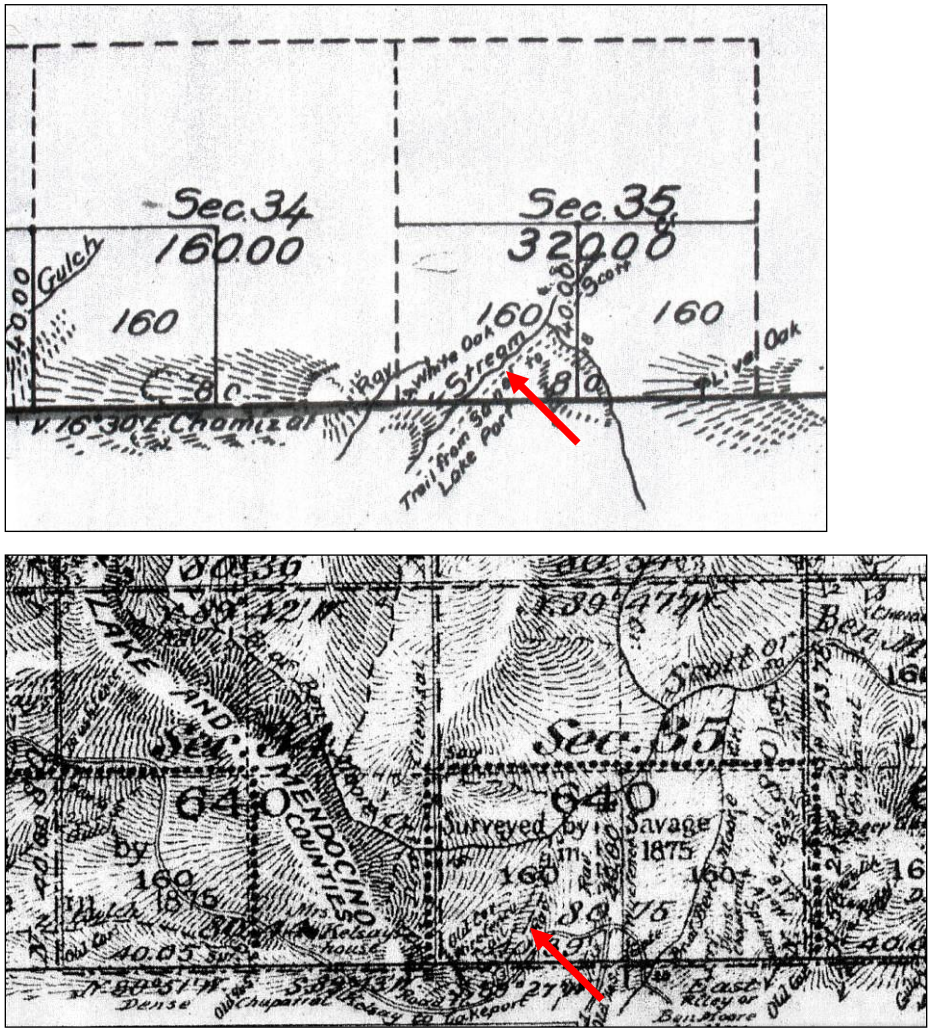

Figure 9: Comparison of Sections 34 and 35 from Township T14N R11W from 1875 (top) and 1896 (bottom). Note the trail section in the SW ¼ of Section 35 which is not part of the "Kelsey to Lakeport" road.

In 1956, Mauldin interviewed Mrs. W.C. Peters of Siskiyou County, formerly a resident of "Benmoore" Valley. She told Mauldin that "Benmoore" was the proper spelling of the valley name. Her family owned Benmore Valley at one time. Her

knowledge of the valley came from living there with her husband W.C. Peters Jr., as well as what she learned from her father-in-law, W.C. Peters, Senior. W.C. Senior never lived on the property. When the Peters moved to the property, the road to the farm passed along a route "via 39 º 0'57" -123º 4' 0" (Mauldin 1956:2331), noted as M8 in Table 3, and on Figure 11. The Peters family built a road from their farm to the McDowell school in McDowell Valley, which they used from 1915 to 1924. Mauldin said this road is not on modern USGS Topographic maps. In 1924, the Peters family also built an access road from their ranch to Highway 16, as Highway 175 was known at the time (Mauldin 1956:2331-2332). The Peters sold their ranch in 1943 to Mr. Banta, who in turn, sold to W. Dorst around 1947. The ranch buildings are labeled "Dorst Ranch" on the Purdys Gardens, California 7.5' topographic map (Maudin 1956:2333).

The routes described by Mrs. Peters were examined so that they could be considered or eliminated as possible segments of the Trail from Hopland to Lakeport. John Poor confirmed the story by Mrs. Peters that there was a road from the Peters (Dorst) Ranch that went past the Poor Ranch. John Poor used to walk up to the Peter's Ranch when he was a boy, and catch a ride on horseback with the Peters children when they went to school in McDowell Valley, and would sometimes stay the night (John Poor pers. com. November 2010). This road may be the route that extends from the Poor Ranch to Benmore Valley, indicated by a dotted line in sections 10 and 3 on Figure 10 below. On Figure 11, the dotted line of Figure 10 is depicted as a dirt road south of Riley Ridge, with Mauldn's waypoint M3 marking the location of a Private Hunting Club.

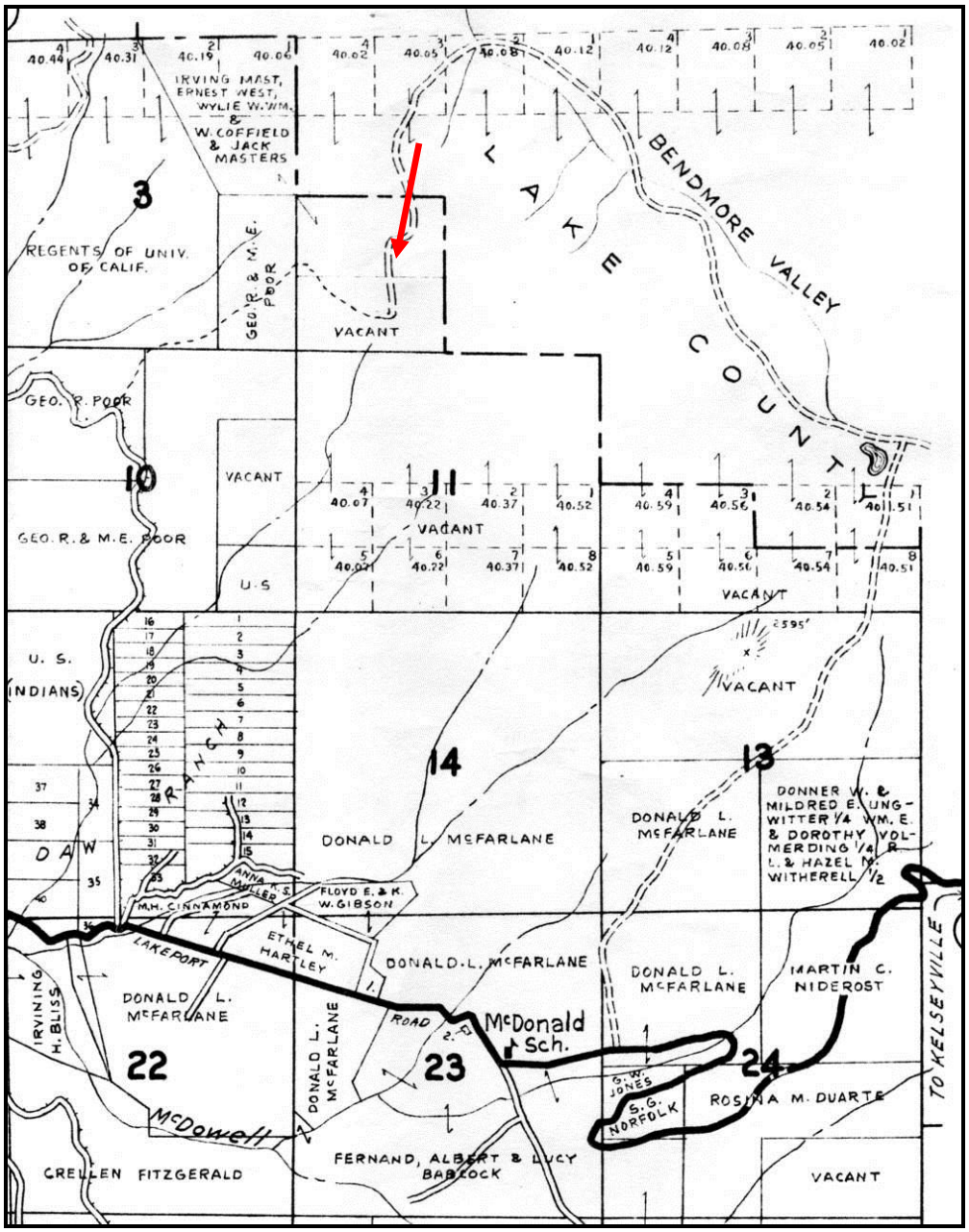

Figure 10: Metsker Property map, from sometime after 1951, for T13N, R11W. The dotted line at the red arrow may be the road that goes from the Poor Ranch through the Private Hunting Club to Benmore Valley. The Hopland Rancheria is now located on the old Daw Ranch.

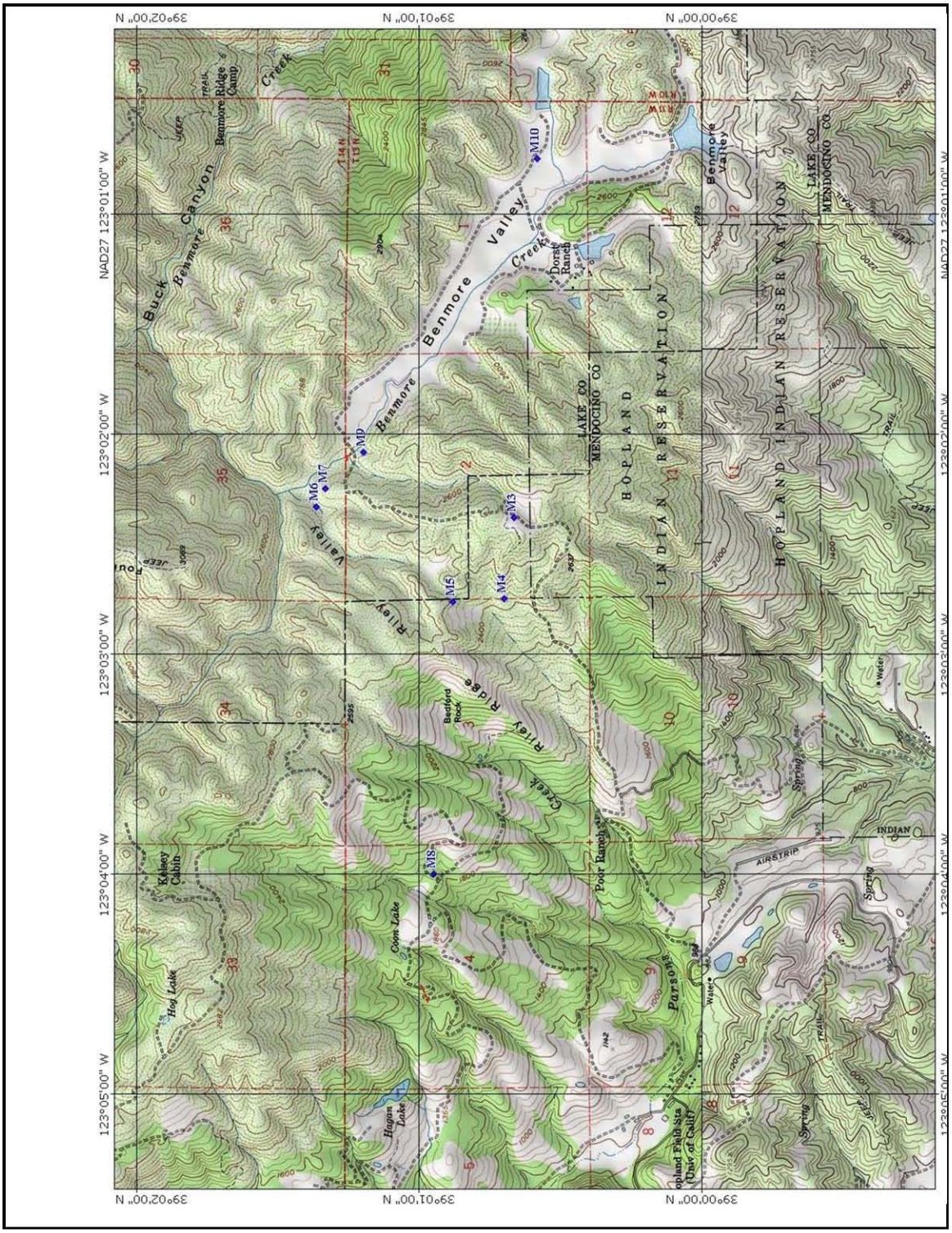

Figure 11: Map of Mauldin's Waypoints from 1956 (See Table 2 below)

Table 2: Mauldin's Waypoints from 1956

Point	Source	Date	General Location	Description
M3	2352:32	1956	Private Hunting Club	Where Mauldin parked his car.
M4	2351:38	1956	Starting Point	Where Mauldin started looking for the trail. It is not far from the actual road, marked as a dotted line on some topographic maps.
M5	2351:40	1956	Near Riley Ridge	The trail at the PG&E line.
M6	2351:42	1956	Benmore Valley	Mouth of stream at trail.
M7			Benmore Valley	Small ridge where trail leaves Benmore Valley
M8	2331:54	1956	Mid HREC	"Original road to Hopland"
M9	2332:25	1956	Benmore Valley	Another trail point, from a different narrative from M3-M8, 100 m SW of Vimark 1. Vimark 1 is close to LAK-956.
M10	2332:26	1956	SE Benmore Valley	Lower Barn where trail goes east along the PG&E line.
M11	2351:52	?	E of Benmore Valley	A point on Benmore Creek, which is described here as "slow and sluggish" in the valley.

Before I started my fieldwork, I assigned each of Mauldin's waypoints a letter and number code (M3-M10) and plotted it on a map. Mauldin drove to the Poor Ranch (M3 in Table 2 above), actually the Private Hunting Club east of the HREC. Mauldin wrote that he believed the trail went up the valley from point M10, and over a low ridge at points M6 and M7 and then went west at M5, which represented the "pole line". Mauldin's points roughly followed the route through Benmore Valley that was indicated on the GLO Plat maps. The point M6 on Figure 11 appears to mark a point on the "trail" segment in Section 35 as shown in Figure 9.

Conversations with Local Ranchers

As a result of conversations with the HREC employees, I learned that part of the route of a trail from Hopland to Lakeport was known to some of the former and present HREC employees and local ranchers. They described three distinct routes from Benmore Valley through the HREC to Hopland, and a plethora of other roads and trails in this part of the Mayacmas Mountains. All three routes appeared to converge in the vicinity of northwest Benmore Valley, and so I treated all of the routes as the potential western segments of the Hopland to Lakeport trail, and gave each a name that described the route. From the north, to south, the first route was recorded on the GLO Plat Maps for T14N R11W (1896) and T13N R11W (1889) as the "Trail from Sanel (or Hopland or Kelsey) to Lakeport". This is the graded access road that runs past several homestead sites on the HREC, and so I named it the "Settler's Road". The second route was the horse trail that entered the HREC through the Foster Pasture after passing along the "old Indian cemetery" at Apple Tree Village, called the "Packsaddle horse trail" for a named ford along its route. It is not on the GLO Plat maps.

The final route considered in this study was described by John Poor, a former HREC and Pratt Ranch employee, and local rancher. This route descended Riley Ridge from the east, along the power pole line. "Indians" from Clear Lake and Hopland used the trail, and sometimes stopped at a spring on the Poor's property. The route took the Pomo on the east side of the Poor ranch house and then to the northwest along the barn and then down the hill to the west (John Poor pers. com. 2010). There is an old road,

mostly unused, that descends Riley Ridge parallel to the power pole line. Pacific Gas and Electricity (PG&E) uses the road to service the power poles. This segment was named the "Riley Ridge Route".

Field Work: The Settler's Road

I toured the eastern portion of the Settler's Road in a high clearance vehicle. During this tour, several sites were visited. Kelsey Cabin no longer exists, but rocks marking the footings, and square nails were found during an earlier survey. An orchard, spring box and a fallen shack remain nearby. The shack was built during Pratt tenure. The privy and barn site have not been located. To the east, before the gate leading into the Private Hunting Club property was another cabin site. It may be the site marked "Mrs. Kelsey's Cabin" on the 1896 GLO Plat map (see Figure 8b above).

We stopped at a recently discovered chert quarry bisected roughly by the road. This previously unrecorded quarry was marked by waypoint 029 (See Table 3 for modern waypoint information). In this section of the road, the power pole line was directly overhead. We drove through the Private Hunting Club compound and down to Benmore Creek in Benmore Valley. The stream was too deep and the ground too soft to cross with a vehicle. Vineyards had been planted in the valley, but most have been removed, and the valley has begun to revert to grassland.

Photo 3: Benmore Valley view to the southeast, with Mt. Konocti on the skyline.

Field Work: The Packsaddle horse trail

The trace of the Packsaddle horse trail is known by its landmarks. The general route is known better in some areas than in others. The geology of the HREC may be to blame for this. Much of the east slope above Parsons Creek and HREC headquarters has been creeping downhill, and several landslides are visible. One of the access roads, however, parallels what must have been the route from a ford of Parson Creek near headquarters to 11 o'clock Point near the eastern boundary of the HREC.

While driving up to Kelsey's Cabin from HREC headquarters, we noted the location of the Packsaddle horse trail crossing the road, the location of Packsaddle Crossing and another segment of this trail below Coon Lake. At this location, 11 o'clock

Point was clearly visible ahead of us through a stand of oaks. At Packsaddle Crossing there is a fork in the trail which roughly follows the contour lines southeast to the Poor Ranch. This section was not followed. We paused at 11 o'clock Point and proceeded on to Kelsey Cabin.

Photo 4: 11 o'clock Point is the third knob on this ridge. The Packsaddle horse trail went to the top of the point, where the horses were rested before going on to Kelsey's Cabin.

Field Work: Riley Ridge Route

John Poor's grandson, Steven Poor and I walked Riley Ridge from Benmore Creek in northwest Benmore Valley, to the junction of the Poor Ranch Road and Parsons Creek. We did not walk the segments in southern Benmore Valley or walk farther than the Poor Ranch, although Mauldin and John Poor believed that the Pomo continued

walking down Parsons Creek near the present day HREC headquarters. See Table 6 for Mauldin's waypoints from 1956 and Table 3 for a list of waypoints recorded while conducting field survey in 2010 and early 2011.

The survey of the Riley Ridge Route began in Benmore Valley at Benmore Creek, which was too deep to cross in a vehicle. We walked north along a well-defined path about a foot wide, along Benmore Creek and continued to the west as the trail turned to follow a small tributary of Benmore Creek. The foot path approached a dirt road running along the base of the chert quarry at waypoint 029 that we visited earlier. This dirt road approximated the trail remnant of Section 35 shown in Figure 9. The power pole lines were clearly visible above the oak trees south of us.

When the trail turned to connect with this road, we followed drainage north of the road. We passed through about 100 yards of chaparral and then intersected with another dirt road near the top of Riley Ridge (the Settler's road). We crossed this road and followed a track down the Riley Ridge to a point where Parsons Creek crossed one of the original roads onto the Poor property. The route that we followed on Riley Ridge was about 50 yards uphill from the power pole line, closely following an old road (Photo 6).

Photo 5: The Benmore Creek tributary followed to the west.

There were few obstructions along this route. The ridge was grassy on the south slope, and the ridgeline was covered with oaks. We followed the ridge to the ranch, where we descended into a creek bed, and approached the "medicine spring" described by John Poor as a stopping point for the Pomo who crossed the Poor Ranch property.

Possible Campsites and Modern Uses of the Riley Ridge Route

Three prehistoric sites near the HREC headquarters have been identified as possible campsites, although these locations may have been too close to existing villages during the ethnographic period to be trailside camps. They are two sites at the Rockpile sag ponds (See Photo 1), the Vineyard Site and the Parsons Narrows site (See Table 1). It seems more likely that the sites were seasonal procurement sites for villages in the Sanel

Valley, and not camps for travelers. However, given the number of recorded sites on the HREC (35 have prehistoric elements), it appears clear that these uplands were an important area for the Shokawa and their predecessors in this region.

Photo 6: Riley Ridge, view to the southwest. The power pole line can be seen in the grassy area at the left center, and the old road is in the right foreground. University Road crosses the picture from left to right at the base of the hills in the center.

Table 3: 2010-2011 waypoints. See Figure 12 for map locations.

Point	Source	Date	General Location	Description
029	GPS	2010	Between Hunting Club and HREC	One point of several in a quarry bisected by the road to the Private Hunting Club and to Benmore Valley. The "pole line" passes overhead. 024-029
030	GPS	2010	NW Benmore Valley	A waypoint along Benmore Creek near to the ford where survey started.
031	GPS	2010	NW Benmore Valley	Located at the mouth of a creek west joining Benmore Creek near a large prominent rock outcrop.
033	GPS	2010	HREC Watershed II Pasture	Schist boulder with PCNs
034	GPS	2011	Poor Ranch	Location of "medicine spring"
035	GPS	2011	HREC nr Poor Ranch	Location of best Parsons Creek crossing below Poor Ranch, also at "pole line".
036	GPS	2011	HREC at road	Marker for Packsaddle Trail
037	GPS	2011	Orchard Pasture HREC	Site of Kelsey Cabin
038	GPS	2011	Upper HREC	Site of an old cabin.
039	GPS	2011	Riley Ridge	GPS trail crosses settler's road.
040	GPS	2011	Riley Ridge	Retired spur road from HREC to Riley Ridge.
041	GPS	2011	Poor Ranch	Parsons Creek tributary crossing the Old Ranch Road.
Qua1	GPS	2011	Foster Pasture HREC	Newly discovered chert quarry.

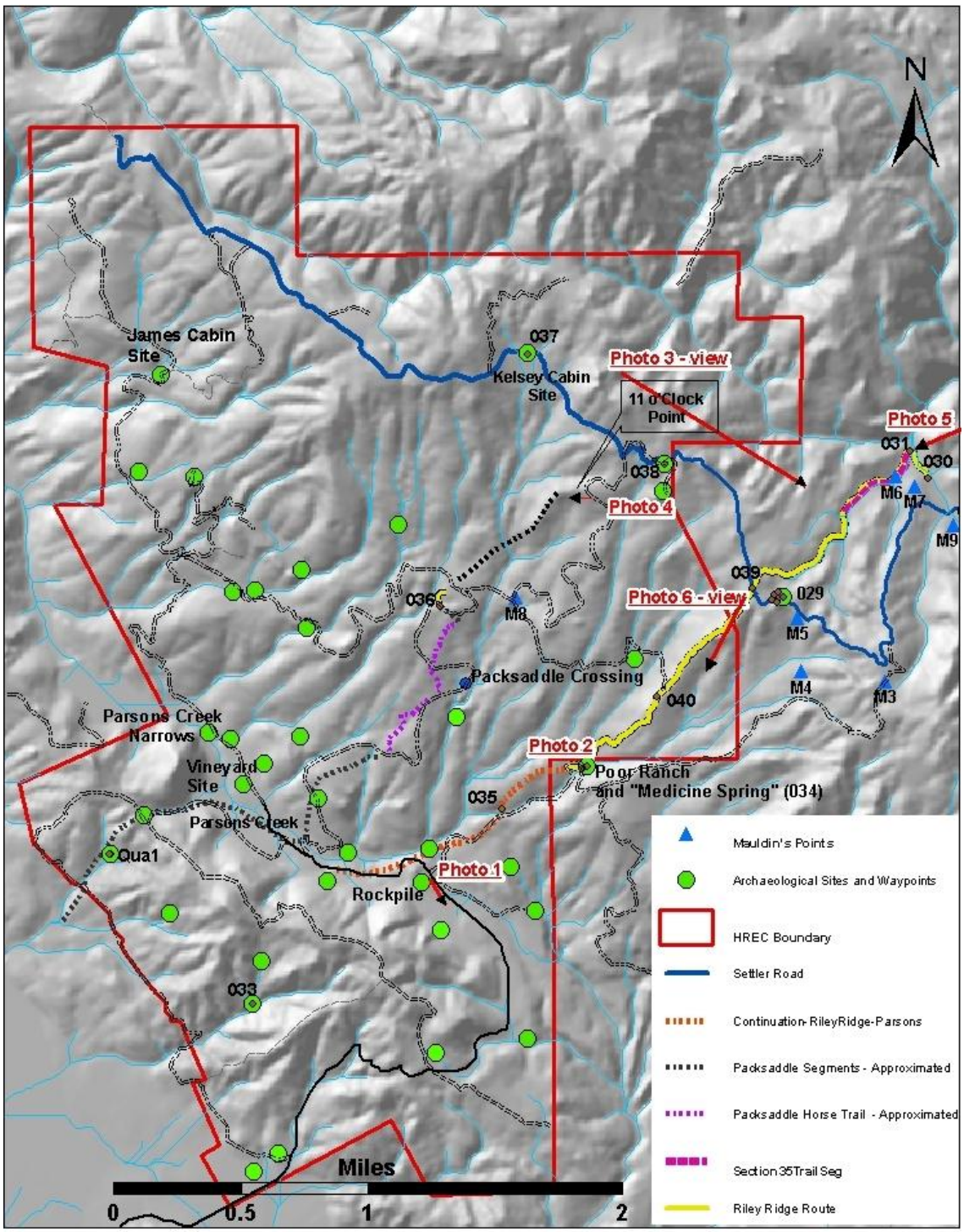

Figure 12: Trail segments, archaeological sites, roads, waypoints and location of all photos. The direction of the view is indicated by a red arrow.

Chapter 9: Methods

This chapter describes the methods used in this study to analyze and weigh the evidence for trails across the HREC and the probability that archaeological sites are not randomly distributed in relation to the trail routes. The evidence for the location of the trail routes was gathered from background research, conversations, and survey of possible trail routes on the HREC and northwest Benmore Valley. Because the data is primarily from ethnographic and modern sources, this will be the temporal basis for the study. It would not be correct to assume that data that is valid for the ethnographic present is valid in deeper time. However, an attempt is made to look deeper into time by examining the trail route segments with known archaeological sites, some of which may have much greater age. This data was analyzed and mapped in a Geographic Information System (GIS) application. The GIS software used in this thesis is the Earth Science Research Institute (ESRI) ArcGIS 9.3.1 (ESRI 2009a).

The hillshade topography for the maps included in this thesis was developed from a selection of 7.5 minute Digital Elevation Model (DEM) images covering Lake and Mendocino Counties (NRCS 2001a, 2001b), with a resolution of 10 meters, which were stitched together using the ESRI ArcGIS 9.3.1. Mosaic tool. A low pass filter smoothed the surface (3 x 3 neighborhood function) because there were anomalies or areas of No Data in the resulting DEM. All data sets were converted to the same projection: North American Datum 1983, Universal Transverse Mercator (UTM) Zone 10 North.

In previous chapters, the natural setting and cultural history were narrated to provide context for the Trail from Hopland to Lakeport. In this narrative are historical depictions of the trail as well as modern day recollections by local ranchers and the historian, Henry Mauldin. The historical references infer the presence of a trail through the Mayacmas Mountains in the study area, that existed before white settlers arrived, but there is no direct evidence for prehistoric use. This is part of the dilemma of studying trails. As discussed in Chapter 2, trails may be reused, repurposed, or destroyed by natural processes, and they can be very difficult to date, although some researchers have been able to approximate the age of trails from sites and destinations of known age (Hyslop 1991:32). A discussion of methods and data accumulation follows, beginning with the gathering of archaeological site information.

Archaeological Sites and Attributes

Data from archaeological site reports was tabulated to assist in the analysis of sites with the trail route segments. This collection of archaeological sites consists of site reports archived at the Northwest Information Center (NWIC) in Rohnert Park and the collected information for seven sites on or near the HREC which have not yet been submitted to the NWIC. Among the seven new sites were two quarries, one petroglyph site (PCN), one spring and three cabin sites. All site information was examined for features and artifacts found there, and the site information was entered into Excel spreadsheets, one for each county. The spreadsheets were converted into an attribute table in a personal geodatabase within the GIS using ESRI ArcEditor 9.3.1.

California archaeological site forms contain coded summary information about a site, called “resource attributes”. Selected code types from each site report were stored in the fields of an attribute table, indicating “presence-absence” of the characteristic (see Table 4 below). Historic sites will have a code beginning with “AH” in the OTHER_CODE field and will have a “y” in other “code” fields if there were prehistoric artifacts present. The location of each site was represented by a single point stored as XY coordinates.

Most of these sites have not been excavated and their age depth is not known, but many sites can be classified as “prehistoric” or “historic” based upon surface finds. A site described as “historic” is one that contains features or artifacts from a time after European Contact in the area. Historic designation does not preclude the possibility that the site was used by the Pomo in historic times, just that this is the class of artifacts present at the site.

Table 4: Attributes for Sites Table**.**

Column Name	**Definition**
FID	ESRI identification code.
SHAPE	All items in this shapefile are points.
OBJECTID	Sequential Number
PRIMARY_NU	Primary number (also assigned by county)
TRINOMIAL	Left off the “CA-”
NAME	Name by which the site may otherwise be known
DATE	Date recorded
TOPO_MAP	USGS Topographical map of the area where site is located.
NAD27_EAST	Easting NAD 27
NAD_27_NORT	Northing
NAD83_EAST	Easting NAD 83
NAD83_NORT	Northing
ETHNOG	If the site is mentioned (and how mentioned) in an ethnography.

DIAG	Diagnostic artifacts
HREC	Is it on the Hopland Research and Extension Center (HREC)?
AP2	Resource Attribute Codes: AP2 indicates a Lithic Scatter
AP5_PCN	AP5 – Petroglyphs, in this case a Pecked Curvilinear Nucleated
AP5_CUPULE	AP5 – Cupule
AP5_OTHER	AP5 – Other cultural markings
AP7	AP7 – Architectural features
AP11	AP11 – Hearths or Pits
AP15	AP15 - Habitation debris
AP16	AP16 – Other
OTHER_CODE	Could include any of the historic or prehistoric attribute codes not listed above.
DARK_SOIL	Was darkened soil, like a midden recorded?
BEADS	Were beads found?
CHERT	Was chert found?
MTK	Was Mt. Konocti obsidian found?
BORAX_LAKE	Was Borax Lake obsidian found?
UNKN_OBS	Was obsidian of unknown provenance found?
BASALT	Was basalt found?
OTHER_TOOL	Other notable tools or artifacts located at the site (fire altered rock, scrapers, mano, blanks, hammerstones)

Trail Segment Field Methods

The potential trails located through conversations and background research were approximated or recorded on a topographic map which was carried into the field. These three trails represent three possible routes of the Trail from Hopland to Lakeport. Points and routes that were surveyed were recorded on a Garmin GPSmap 60 CSx handheld Global Positioning System (GPS) and noted on the map. The Garmin does not have differential correction capability, but in the case of point data, the circular error was reduced by taking advantage of the Garmin's point averaging capability.

Post Survey: Trail Route Segments and Sites

The trail routes located through background research and survey were recorded in GIS on the hillshade layer previously described. Those trail segments which were recorded with GPS are shown with solid yellow lines. Most of the Settler's Road was inspected from a vehicle. It is illustrated on GLO Plat maps, modern topographic maps and was described to me as the route that accessed the settler's cabins, hence its name. There may be a few discrepancies between the Settler's Road as presented on the GLO Plat Maps and on a modern topographic map. They are assumed to be relatively minor and the route is shown as a solid blue line. From the east boundary of the HREC to northwest Benmore Valley is an extension of the Settler's Road, which runs through the newly discovered quarry at waypoint 29 and the Private Hunt Club at Mauldn's point M3. It is also indicated by a solid blue line.

The Riley Ridge Route is indicated in solid yellow. It is overlain on the maps by a dashed pink line, indicating the location of the trail shown in Section 35 of the GLO Plat Map T14NR11W of 1875 and 1896 (see Figure 9).

Other segments were digitized from aerial photographs or approximated from landmarks and they are indicated by dashed lines. The blue dashed line in Benmore Valley represents a digitized version of the map in the archaeological site report for CA-LAK-957, described as a "well traveled foot trail" (Werner 1977a,b) which was not included in the proximity study because it was not examined during survey and is not

apparent on aerial photographs. The Riley Ridge Route was also extended into the headquarters area with an approximate route based on Mauldin's and John Poor's account (Figure 12). The dashed line is orange to distinguish it from the Packsaddle Trail.

The Packsaddle horse trail is known mostly from its landmarks, and is mostly represented by purple or black dashed lines. The black dashed lines represent a best guess of the route past Apple Tree Village Cemetery, the best crossing of Parsons Creek in the headquarters area, and the approach to 11 o'clock Point. Much of the slope to the northeast of the HREC headquarters is comprised of soil on a serpentine mélange, which is subject to landslides. An examination of aerial photos confirms that the ground surface in this area is very rough. If the trail crossed this section, it has been obliterated through geomorphic processes. The segments which are visible on aerial photos, noted by HREC workers, and visible from the nearby accessed road are shown by a purple dashed line. Only a small section of this trail was surveyed with a GPS unit.

Trail and Site Statistical Methods

Because some researchers have been able to use the temporal data of related sites as a measure of how old a trail might be, this thesis includes a statistical study of nearby archaeological sites, and the probability of a relationship to the trail route segments. Without a demonstrated statistical probability of a relationship, the sites cannot be used to infer the possible age of the trail.

Although most of the archaeological sites in the study area lack temporally diagnostic data, this situation may change later. It is also possible this technique may be useful to trail researchers working in geographical areas where a larger number of sites of known ages are available. For purposes of this study, the archaeological sites in the study area will make up one group of samples and will also be divided into two subcategories: historic and prehistoric, based upon artifacts found during survey.

Of the 40 sites identified in the study area, 35, or 87.5 percent, were considered to be "prehistoric" based on archaeological findings at the sites. Three of these sites determined to be prehistoric, also had artifacts from the historic era, including a collapsed barn, square nails and undifferentiated historic material. A fourth prehistoric site, CA-MEN-852 (Rockpile) was a known campsite for woodcutters in historic times, but no historic artifacts were listed in the site report. These four sites are counted twice, once in each subcategory, for a total of eight sites with historic attributes, or 20 percent of the 40 sites.

The reason for this statistical analysis is to determine if there is a possible relationship between the distribution of the archaeological sites with respect to one or more of the trail route segments. A second group of 40 points, representing distribution by chance, were created with the ESRI ArcGIS 9.3.1 command line random point generator, using a buffer around the HREC and upper Benmore Valley as the boundary, or constraining feature class (ESRI 2010). All points, random or archaeological, were located within this boundary. My assumption was that if the archaeological points were

not related to the trail route segment, they would show a distribution which was statistically no different than the distribution of the randomly generated points. This statement was the null hypothesis of the study: there is no difference between the distribution of random and archaeological points, meaning that the set of archaeological site locations represent another sample of 40 points from within the population of randomly generated points.

Each trail route segment was analyzed separately from the entire route. The reason for this is that the data for the trail route segments was derived using different methods, so some segments were more likely than others to be reliably represented on the map.

First, the boundary for analysis was defined to be the constraining feature class used for the generation of the random points. Next, distances from each of the trail route segments were generated. The ArcGIS Spatial Analyst/Distance/Straight Line tool generated the distances at one meter resolution from the polyline representing the trail route segment to every one meter grid cell within the constraining boundary. Then, each distance raster was sampled using the ArcGIS command line tool Sample_sa. For each distance raster, the distance value for each grid cell corresponding to the XY coordinates of each set of points: archaeological, random, historical and prehistorical, was saved in a table.

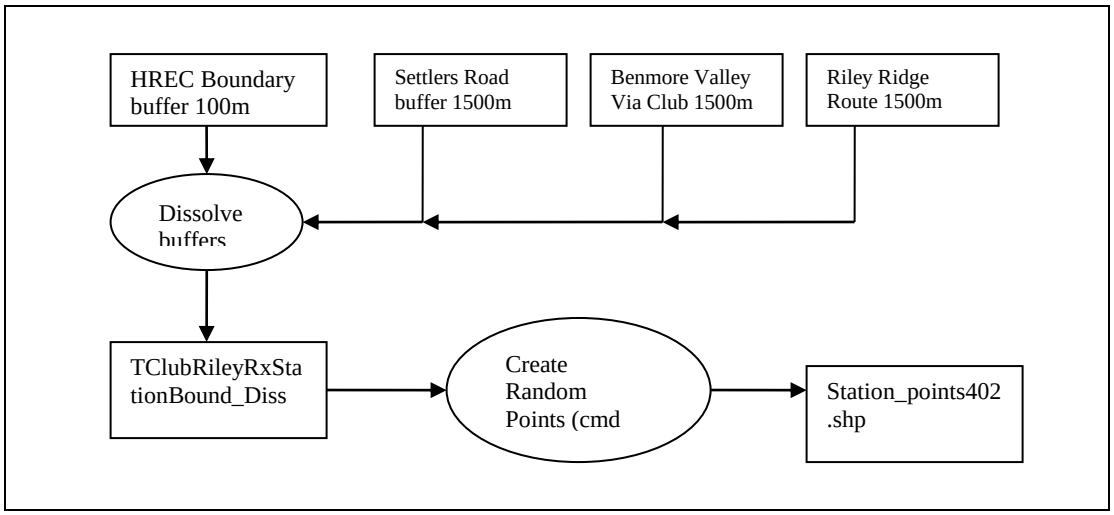

Figure 13: Flowchart showing method for creating random points within an extent represented by TClubRileyRxStationBound_Diss.

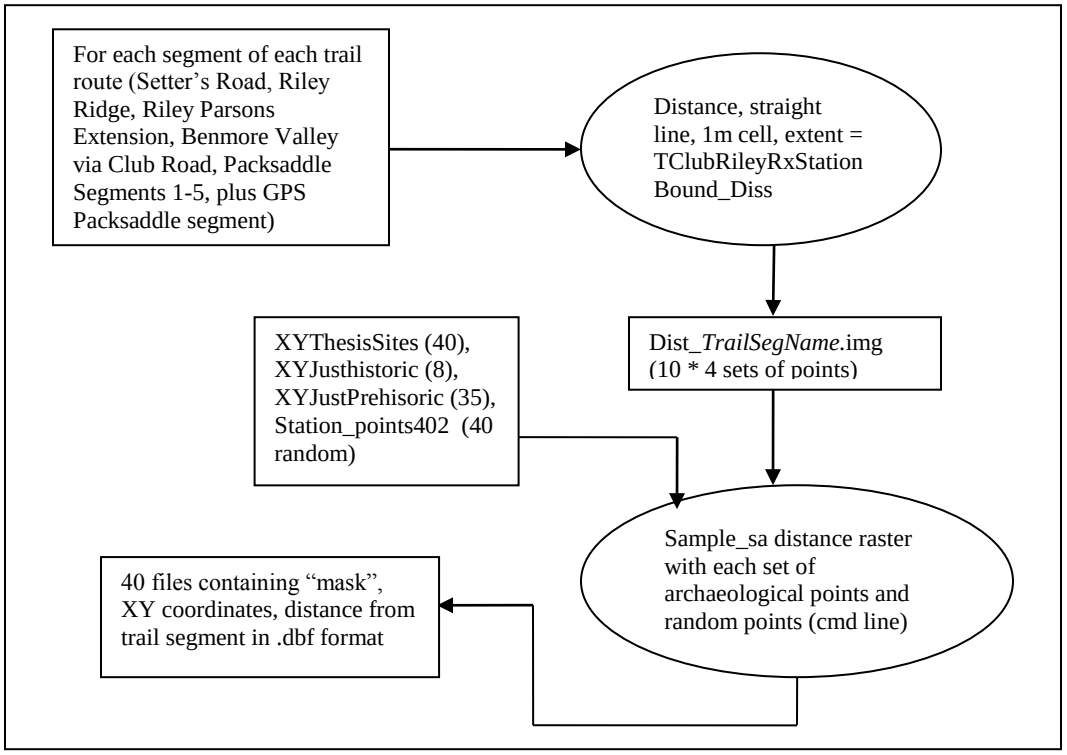

Figure 14: Flowchart for calculating distance from the trail route segments to each archaeological and random point.

For the statistical tests, the means for two pairs of samples (archaeological and random) were compared in a Two-Way (T-) test, and again, with the archaeological sites

separated into two samples: prehistoric and historic, in a One-Way Analysis of Variation (ANOVA) test with the 40 random points. In both test cases, the null hypothesis was that there was no difference in distribution of the archaeological points as compared to the random points. In the ANOVA test, the number of samples in each group was different because the archaeological group was subdivided into two groups, one with 35 samples and the other with 8 samples. This difference was taken into account during the calculation of the ANOVA test.

The T and ANOVA tests result in the calculation of an F-value and a P-value. In both tests, the F-value is compared to an F-critical value, which is a value under the normal curve that must be exceeded by the F-value for the null hypothesis to be rejected. It is based upon ratio of the degrees of freedom for variation in the data of the variability of the means (between groups), and the variability of the mean of the samples (within group, or the "error"). In this thesis, I selected the commonly used confidence level of 95%, represented by an alpha value of 0.05, or, no more than 5% of results will be the product of chance. In order to reject the null hypothesis, the F-value must be greater than or equal to the F-critical value.

The P-value is a probability, the calculated value of confidence, as opposed to the selected value of 0.05. If the F-value $\geq$ F-critical, the P-value will be low, less than or equal to the selected alpha value. The lower the P-value, the higher the level of confidence that for a given trail route segment, the location of the sites in the sample will not be a product of chance.

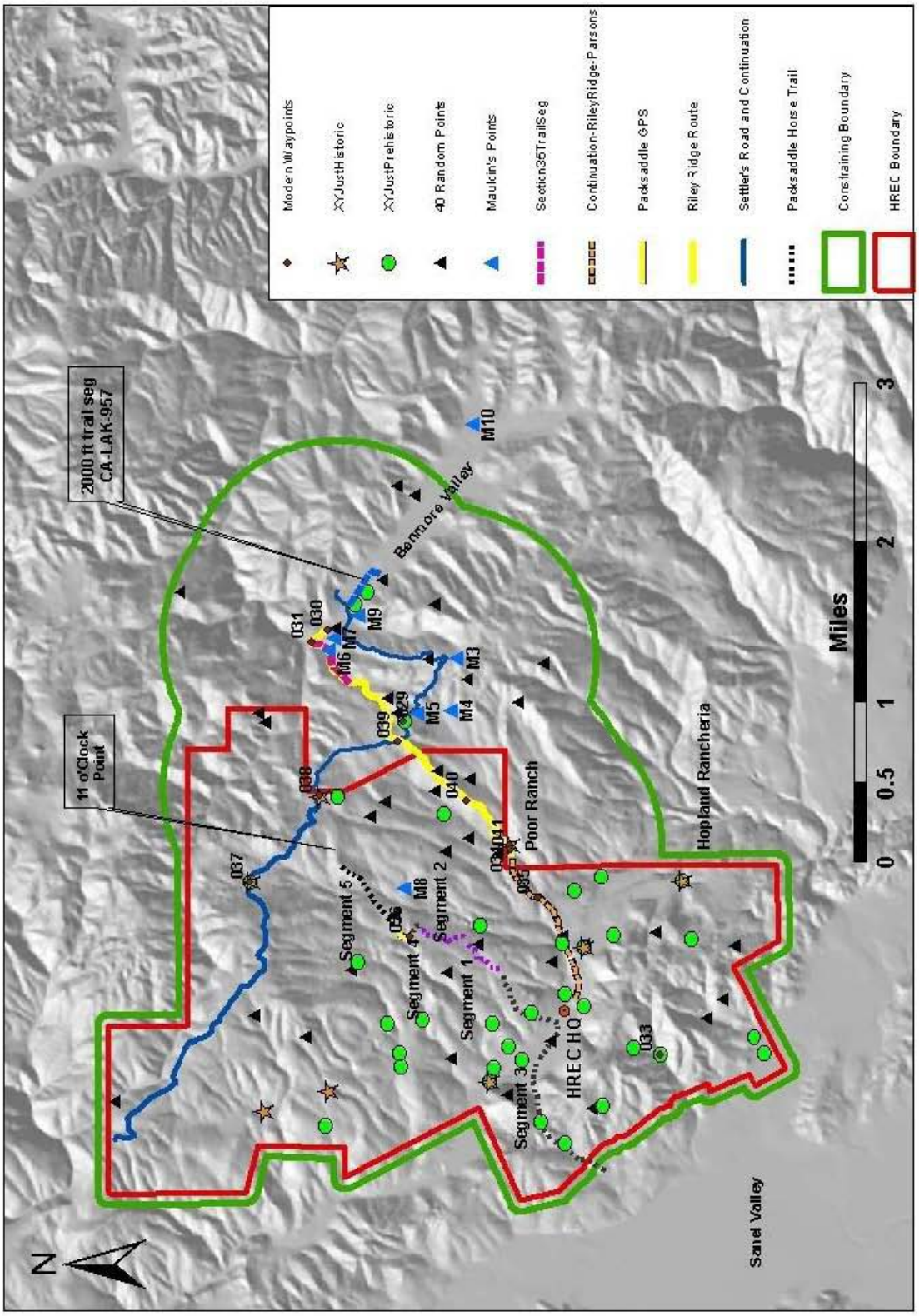

Figure 15: Study area with constraining area for the 40 random points.

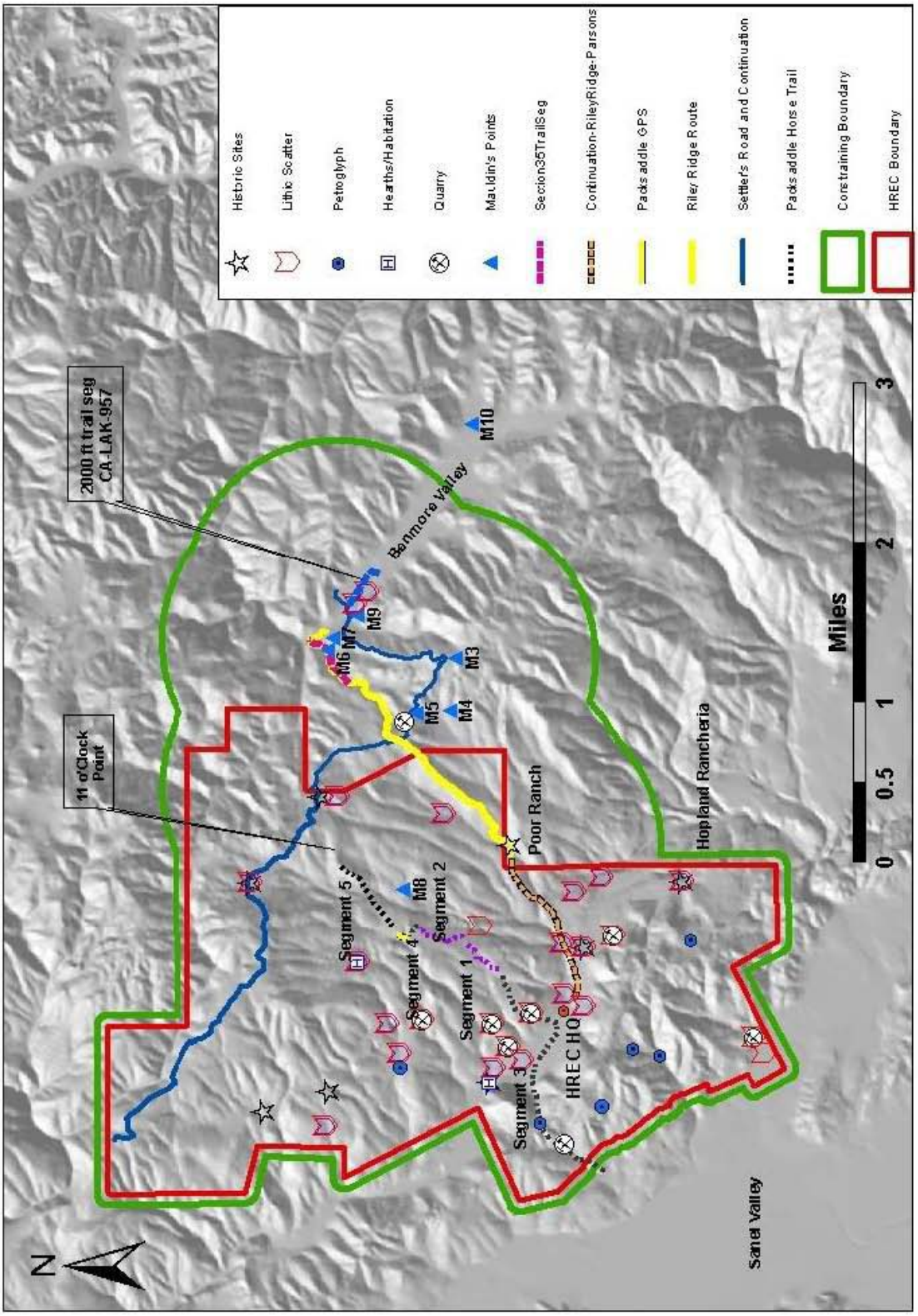

Figure 16: Study area with archaeological sites characterized by attribute type. Several sites have multiple attributes, resulting in overlapping symbols.

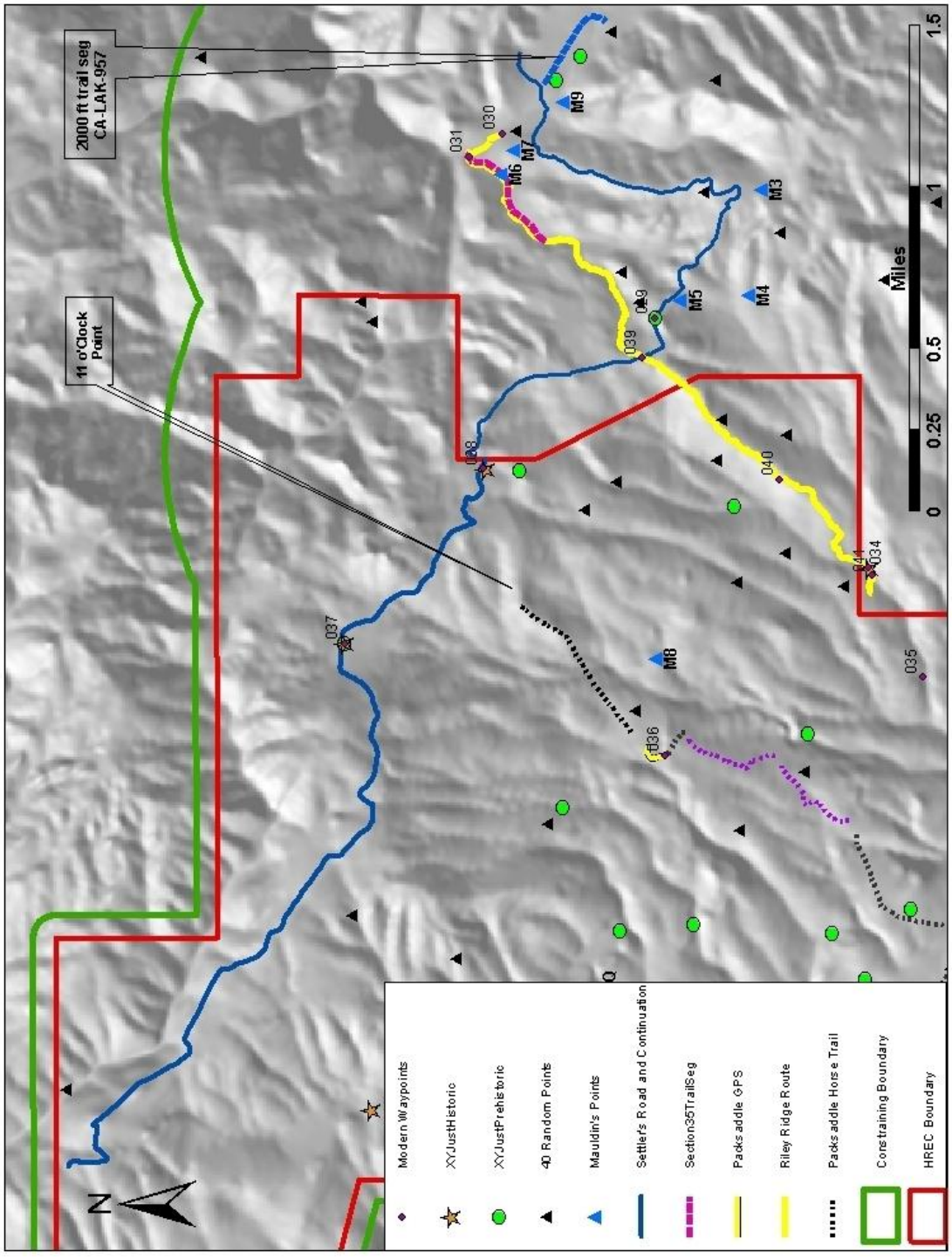

Figure 17: Trail segment detail view of the Settler's Road and extensions, showing nearby archaeological sites, waypoints, and random points.

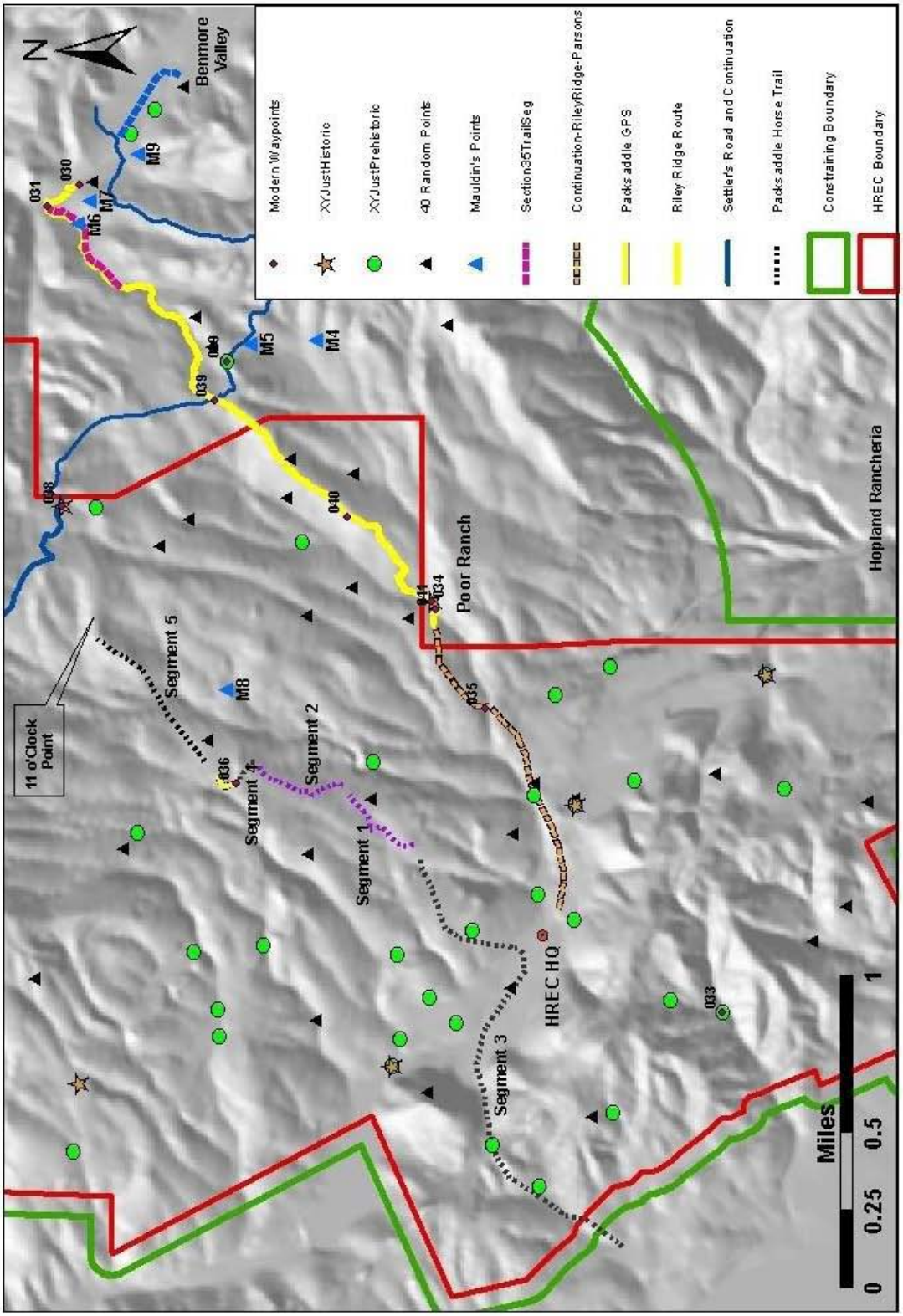

Figure 18: Trail segment detail view of the Packsaddle horse trail and Riley Ridge Route and extensions, nearby archaeological sites, waypoints, and random points.

Table 5:
T-Test for Trail Route Segments

Sample 1: 40 Archaeological Sites Sample 2: 40 Random Points

(All statistics were calculated using the VassarStats Website for Statistical Computation, @ Richard Lowry 1998-2011, Professor Emeritus of Psychology, Vassar College. http://faculty.vassar.edu/lowry/VassarStats.html)

Settler's Road Sample 1	**Random Sample 2**	**Settlers Cont. Sample 1**	**Random Sample 2**	**Riley Ridge Sample 1**	**Random Sample 2**
4062.0810	995.2010	4087.1340	841.5331	2484.0020	866.4468
3491.8340	4391.6520	4353.8200	4127.1390	2935.9010	2535.5140
1956.6540	880.3602	1498.9400	729.1783	9.8995	872.3222
15.2316	2214.2200	67.4240	438.4165	909.1144	748.8257
942.9894	3130.9250	3279.9650	1230.3390	3570.6190	1621.6760
1291.5100	1154.0000	3030.4170	619.3585	2987.1790	118.5327
1103.6830	1820.2760	1.0000	2264.5390	143.4015	1345.6200
1597.1740	2749.1710	2779.2520	3628.4790	2267.6270	2402.3670
2707.8230	1534.8810	3041.6350	1188.8310	1579.4690	244.8060
1479.2860	2069.8000	3382.3340	3022.7180	3287.2590	2120.9150
3221.8140	1192.7490	3249.4830	459.9130	1673.3900	36.7967
3023.0300	2961.9010	3037.9760	3394.5400	1477.7020	1904.7290
1346.1540	1223.1320	2458.9440	1486.9650	2090.8270	1277.2360
3176.0700	3591.8180	4040.2450	3175.9500	2688.4560	1628.6690
3722.2060	1855.6220	3116.0010	1487.0860	1726.3300	129.0039
2572.0420	516.9623	3231.8090	597.9674	1915.2670	762.8191
2766.0740	2052.4160	2602.0160	2208.3110	1006.9500	948.0338
3665.0690	3172.8510	4207.7540	1208.5710	2669.3560	1617.0250
2928.8660	4388.7750	2410.9360	3900.1050	927.0523	2406.2470
2690.9120	2964.8410	2289.7310	2746.9200	714.5831	1141.8100
3785.2870	660.2424	3875.7260	574.8191	2280.5060	555.7814
1677.6250	262.8650	2912.7810	2356.0410	2385.9260	3012.5190
1250.1010	216.0046	858.3432	3737.7320	258.6445	4604.8750
14.0000	2739.3320	1123.2780	2551.5790	2013.2210	952.7329
937.0000	2764.7360	1788.2380	2702.4070	1861.2200	1138.2250
1672.5840	3574.0090	2556.9560	4176.3010	1868.8340	2654.6350
2743.4380	1721.4960	3418.0840	38.0789	2047.6430	631.1592
2503.7600	867.2191	3320.1150	1854.8990	2134.9440	1971.0290
2525.4330	1094.6160	3418.8960	108.2266	2279.1330	77.4919
2349.4690	2181.8220	2950.0040	835.0239	1699.6900	1079.7370
179.7248	2207.5840	222.8004	493.5838	791.0455	1064.4780
2981.6480	1156.6540	2771.4880	261.2049	1166.6280	69.1158
1915.5610	765.4241	80.0562	2490.1730	385.5191	2749.1730
2058.0410	1502.6340	244.3808	749.2162	555.1802	176.7767
1885.5380	1637.5440	17.4643	95.6034	329.2795	81.0494
4917.1870	2447.6360	4622.2370	1583.4800	3042.4010	1415.1020
3956.0810	2588.9780	3504.9270	981.2242	1982.6350	1530.5230
5087.8710	1338.5920	4809.5930	1212.4340	3226.2590	515.9235
1957.5300	1853.4710	2037.3940	275.2889	764.8752	859.9982
3210.3660	4470.2190	2885.8940	4134.794	1295.3330	2564.2340

Summary

Source	Mean Samples 1&2	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Settlers	2384.2187	0.172	1.9	3.96	2612241	2612241	1
	2022.8158				107442097	1377473	78
Settler Cont	2589.6368	**0.006**	**7.97**		14125865	14125865	1
	1749.2242				38224427	1772108	78
Riley Ridge	1735.8325	0.558	3.77		3612222	3612222	1
	1310.8488				74809682	959098	78
Riley Cont	1386.1649	0.118	2.49		2768995	2768995	1
	1758.2533				86753888	1112229	78

Table 5 continued:
T-Test for Trail Route Segments

Sample 1: 40 Archaeological Sites Sample 2: 40 Random Points

Riley Ridge Continuation Sample 1	**Random Points Sample 2**	**Packsaddle Segment 1 Sample 1**	**Random Points Sample 2**	**Packsaddle Segment 2 Sample 1**	**Random Points Sample 2**
1007.4250	2938.5110	1814.8590	3116.7640	2290.0220	2709.6110
1436.2120	1321.0420	1876.0940	2115.4530	2308.5890	2556.7020
141.8767	2837.7610	1070.8190	3003.2560	1046.9270	2594.4710
2033.6940	3090.9300	2090.9240	3742.4460	1676.0500	3523.6490
3317.2240	3791.1930	2635.3960	4534.6700	2412.5830	4362.5300
2638.2570	1028.6950	1996.3290	1550.1000	1857.6680	1380.9130
1756.2420	1155.0690	2311.9160	348.7363	2088.7670	306.1062
1832.3340	1166.3130	1215.2550	1274.3980	1204.1200	1640.6950
459.6194	487.0750	533.9036	1053.0570	1007.4290	1003.3070
2801.7930	1378.5620	2260.8800	1004.4150	2176.4710	1160.0840
101.0198	1158.5240	911.2596	1746.1990	1383.5600	1585.9900
115.5725	480.8825	687.6315	890.2949	1156.0360	1361.3230
1900.3670	1262.3910	1112.8700	781.3962	979.5611	295.6653
1264.9920	880.6957	1599.1350	1591.6520	2013.6920	1918.7600
1307.2910	155.9006	2019.3190	940.7896	2258.8400	912.3382
812.1995	1495.9380	790.7370	1605.0170	1188.0830	1239.9270
17.0000	723.3871	665.7702	67.8823	985.6495	157.4706
1091.2680	3932.8230	1719.6430	4653.4140	2192.6940	4463.9500
601.2021	1607.0910	1371.1110	2350.8880	1511.4460	2710.3650
289.9138	166.9281	1065.3570	860.5655	1193.4690	1198.2870
752.0067	1399.5560	1550.1890	1634.4310	2028.8540	1317.9750
1870.5520	2965.7790	1319.8700	2264.5480	1331.3170	1890.4160
824.1147	4628.1410	1310.7220	3904.9210	1168.4770	3551.4350
2639.2690	9.8489	2261.9660	693.6981	1774.2890	985.0249
1790.1070	197.6689	1113.8480	510.4214	714.2023	911.8032
1538.0310	1089.6610	816.5415	1675.8400	816.5011	2143.2010
795.2515	2177.7770	944.1102	2876.9690	1362.1250	2709.9830
1061.4500	1894.4310	997.1083	1201.3700	1333.6720	817.2466
1185.5570	1865.3400	1140.4000	2406.9610	1455.4820	2171.3240
867.4388	1571.9980	560.4400	2465.4830	917.7985	2427.1980
1865.7940	2681.1080	1965.4400	3421.6360	1570.2090	3266.5480
160.9969	2038.8970	859.3079	2579.5160	1206.2360	2335.0110
3007.7970	2648.2950	3584.4450	1880.8640	3327.5160	1583.1440
3051.4060	912.3755	3663.6820	1644.0680	3424.1680	1578.0910
3022.8990	2914.0530	3584.9190	3418.8800	3320.4470	3130.0360
1837.2620	4286.5010	2637.3190	4558.8380	3082.5100	4162.0360
1202.2710	1983.1770	1931.8120	2902.6240	2278.0560	2868.3080
1983.5640	679.1178	2789.9200	934.7326	3241.9410	802.7179
581.0034	1860.2820	200.2324	2644.0270	195.0000	2543.8410
484.3222	1466.4140	1180.9220	2249.7310	1502.1470	2671.5870

Summary

Source	Mean Samples 1 & 2	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Pack Seg 1	1604.4032	**0.046**	**4.11**	3.96	4483358	4483358	1
	2077.5238				85183276	1092093	78
Pack Seg 2	1724.5651	0.169	1.93		1789953	1789953	1
	2023.7268				72210731	925778	78

Table 5 continued:
T-Test for Trail Route Segments

Sample 1: 40 Archaeological Sites Sample 2: 40 Random Points

Packsaddle Segment Sample 1	**Random Points Sample 2**	**Packsaddle Segment 4 Sample 1**	**Random Points Sample 2**	**Packsaddle Segment 5 Sample 1**	**Random Points Sample 2**
1044.9920	3621.1610	2742.1280	2671.6490	2980.9500	1709.6150
51.6140	1485.4670	2603.4150	3022.9350	2797.1160	3278.9480
1327.1820	3507.9200	1225.6920	2556.4050	1435.4850	1594.0800
2596.6210	4171.8290	1638.0370	3500.5030	706.3207	2886.5080
2719.8390	4930.9480	2294.8050	4341.2540	2275.4480	3790.4130
2057.9240	1986.0720	1757.5940	1361.9640	1783.2900	1150.3830
2757.0860	587.4504	2066.2360	518.5219	1579.7190	721.5157
1246.2620	285.7219	1177.2550	1876.0450	1283.1360	2062.4040
50.4480	1442.6400	1420.3170	1019.2670	1639.6260	1150.0400
2130.9250	818.9066	2086.5370	1294.6490	2124.1050	1457.9040
308.7685	2171.5550	1838.0490	1567.0280	2081.3380	1324.1770
300.7607	5.6569	1612.6530	1762.1450	1858.6280	1970.2330
1255.9530	1263.1580	907.6255	246.0081	987.5890	78.0064
2.0000	1348.8620	2288.1970	2369.9470	2479.8080	2637.8510
1907.3670	1236.9260	2674.7850	1072.0250	2939.1890	1280.9220
327.9634	2105.8420	1487.9440	1208.1510	1687.6900	573.2827
666.3212	408.5903	1445.9980	621.3896	1712.2770	879.8801
569.0035	5060.1320	2578.4800	4441.8550	2783.8740	3851.8370
1396.6000	1936.4720	1897.6220	3166.7730	2157.3830	3434.2440
1097.0510	827.3724	1588.2580	1658.5040	1850.6870	1924.9030
768.2142	2124.1250	2476.4920	1291.0570	2712.0270	776.4619
1293.2520	2542.6520	1314.3660	1757.6010	1421.2530	1654.3840
1743.6800	4120.4410	1151.5020	3418.8330	1054.7500	3298.6200
2721.5620	700.8745	1693.8150	1440.5180	895.1157	1707.8090
1474.2860	490.1102	581.3820	1378.6970	505.8903	1638.2620
909.0242	497.3138	854.9415	2513.8630	1000.6170	2717.8260
147.7058	3284.1030	1676.1290	2689.5400	1876.3290	2250.7250
412.2839	1540.8780	1567.4190	684.8336	1755.3760	616.4454
437.2928	2856.8750	1668.8320	2148.1340	1850.5880	1616.9250
284.4293	2760.3030	1207.4580	2459.0850	1408.5570	2375.4380
2469.5670	3815.2670	1534.4380	3246.3300	676.0185	2786.4350
804.2698	3031.6990	1667.8410	2311.2920	1933.7850	1734.9130
4035.1600	2079.1660	3302.7990	1458.9960	2616.7250	1422.6800
4104.9180	2019.6240	3400.1530	1563.7540	2746.6730	1481.9890
4039.3910	3885.6190	3295.3450	3102.8610	2593.4630	2359.1430
1969.7130	5060.6640	3548.4070	4124.5990	3803.3650	3160.4240
1589.7070	3168.5920	2732.4370	2918.7400	3000.1300	2837.3510
1998.9370	1386.1490	3706.6080	788.4092	3959.0280	872.2775
559.9178	3012.4460	607.0132	2526.4810	875.0092	2257.8110
1053.4060	1673.0360	1955.5580	3138.4250	2223.2500	3399.2250

Summary

Source	Mean Samples 1 & 2	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Pack Seg 3	1415.785	**0.0054**	**8.33**	3.96	13301801	13310801	1
	2231.3155				124561147	1596937	78
Pack Seg4	1931.8641	0.348	0.89		792916	792916	1
	2130.9767				69879133	895886	78
Pack Seg5	1951.2902	0.920	0.01		5622	5622	1
	1968.0573				62679167	803579	78
Pack GPS	1959.474	0.306	1.06		962150	962150	1
	2178.8082				71052032	910923	78

Table 5 continued:
T-Test for Trail Route Segments

Sample 1: 40 Archaeological Sites Sample 2: 40 Random Points

Packsaddle GPS Segment Sample 1	Random Points Sample 2
2779.7110	2633.2490
2604.0280	3084.9760
1372.2180	2517.5290
1603.4620	3558.6570
2231.4120	4416.2200
1705.7010	1467.6120
2134.3750	521.8448
1150.4180	1874.7170
1436.6210	1163.4650
2038.1580	1288.9750
1881.6830	1671.0250
1660.1280	1767.6010
870.0264	188.4728
2288.2190	2467.3750
2791.3420	1218.7600
1490.3100	1218.8200
1534.4630	693.1089
2582.7550	4509.1870
2022.3650	3259.4140
1709.8260	1747.0210
2510.2110	1328.0760
1288.2430	1677.8390
1274.4510	3340.3860
1590.7040	1534.0030
502.4938	1449.0670
844.8130	2517.7300
1678.6880	2775.3640
1566.3950	608.5063
1666.4370	2209.3800
1210.2780	2599.6280
1516.4340	3333.1820
1754.5150	2366.3570
3343.9620	1390.9580
3449.2090	1700.2570
3332.8730	3130.0860
3608.4570	4087.6700
2827.1200	3060.3780
3762.5060	926.1539
712.9243	2639.6200
2051.0240	3209.6580

Table 6:
ANOVA Test for Trail Route Segments

Sample 1: Prehistoric Archaeological Sites n=35, Sample 2: Historical Archaeological Sites n=8; Sample 3: 40 Random Points

Settler Road			Settler Continuation		
Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
4062.0810	1956.6540	995.2010	4087.1340	1498.9400	841.5331
3491.8340	15.2316	4391.6520	4353.8200	67.4240	4127.1390
1103.6830	942.9894	880.3602	1.0000	3279.9650	729.1783
1597.1740	1291.5100	2214.2200	2779.2520	3030.4170	438.4165
2707.8230	3722.2060	3130.9250	3041.6350	3116.0010	1230.3390
1479.2860	14.0000	1154.0000	3382.3340	1123.2780	619.3585
3221.8140	2525.4330	1820.2760	3249.4830	3418.8960	2264.5390
3023.0300	2981.6480	2749.1710	3037.9760	2771.4880	3628.4790
1346.1540		1534.8810	2458.9440		1188.8310
3176.0700		2069.8000	4040.2450		3022.7180
3722.2060		1192.7490	3116.0010		459.9130
2572.0420		2961.9010	3231.8090		3394.5400
2766.0740		1223.1320	2602.0160		1486.9650
3665.0690		3591.8180	4207.7540		3175.9500
2928.8660		1855.6220	2410.9360		1487.0860
2690.9120		516.9623	2289.7310		597.9674
3785.2870		2052.4160	3875.7260		2208.3110
1677.6250		3172.8510	2912.7810		1208.5710
1250.1010		4388.7750	858.3432		3900.1050
14.0000		2964.8410	1123.2780		2746.9200
937.0000		660.2424	1788.2380		574.8191
1672.5840		262.8650	2556.9560		2356.0410
2743.4380		216.0046	3418.0840		3737.7320
2503.7600		2739.3320	3320.1150		2551.5790
2525.4330		2764.7360	3418.8960		2702.4070
2349.4690		3574.0090	2950.0040		4176.3010
179.7248		1721.4960	222.8004		38.0789
2981.6480		867.2191	2771.4880		1854.8990
1915.5610		1094.6160	80.0562		108.2266
2058.0410		2181.8220	244.3808		835.0239
4917.1870		2207.5840	4622.2370		493.5838
3956.0810		1156.6540	3504.9270		261.2049
5087.8710		765.4241	4809.5930		2490.1730
1957.5300		1502.6340	2037.3940		749.2162
3210.3660		1637.5440	2885.8940		95.6034
		2447.6360			1583.4800
		2588.9780			981.2242
		1338.5920			1212.4340
		1853.4710			275.2889
		4470.2190			4134.794

ANOVA Summary

Source	Mean: Samples 1,2 & 3	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Settler	2550.7664	0.066	2.8	3.11	7702210	3851105	2
	1681.209				110054618	1375682	80
	2022.8158						
Settler Cont	2734.036	**0.006**	**5.45**		18149633	9074816	2
	2288.3011						
	1749.2242				13300149	1666251	80

Table 6 continued:
ANOVA Test for Trail Route Segments

Sample 1: Prehistoric Archaeological Sites n=35, Sample 2: Historical Archaeological Sites n=8; Sample 3: 40 Random Points

Riley Ridge			Riley Ridge Continuation		
Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
2484.0020	9.8995	866.4468	1007.4250	141.8767	2938.5110
2935.9010	909.1144	2535.5140	1436.2120	2033.6940	1321.0420
143.4015	3570.6190	872.3222	1756.2420	3317.2240	2837.7610
2267.6270	2987.1790	748.8257	1832.3340	2638.2570	3090.9300
1579.4690	1726.3300	1621.6760	459.6194	1307.2910	3791.1930
3287.2590	2013.2210	118.5327	2801.7930	2639.2690	1028.6950
1673.3900	2279.1330	1345.6200	101.0198	1185.5570	1155.0690
1477.7020	1166.6280	2402.3670	115.5725	160.9969	1166.3130
2090.8270		244.8060	1900.3670		487.0750
2688.4560		2120.9150	1264.9920		1378.5620
1726.3300		36.7967	1307.2910		1158.5240
1915.2670		1904.7290	812.1995		480.8825
1006.9500		1277.2360	17.0000		1262.3910
2669.3560		1628.6690	1091.2680		880.6957
927.0523		129.0039	601.2021		155.9006
714.5831		762.8191	289.9138		1495.9380
2280.5060		948.0338	752.0067		723.3871
2385.9260		1617.0250	1870.5520		3932.8230
258.6445		2406.2470	824.1147		1607.0910
2013.2210		1141.8100	2639.2690		166.9281
1861.2200		555.7814	1790.1070		1399.5560
1868.8340		3012.5190	1538.0310		2965.7790
2047.6430		4604.8750	795.2515		4628.1410
2134.9440		952.7329	1061.4500		9.8489
2279.1330		1138.2250	1185.5570		197.6689
1699.6900		2654.6350	867.4388		1089.6610
791.0455		631.1592	1865.7940		2177.7770
1166.6280		1971.0290	160.9969		1894.4310
385.5191		77.4919	3007.7970		1865.3400
555.1802		1079.7370	3051.4060		1571.9980
3042.4010		1064.4780	1837.2620		2681.1080
1982.6350		69.1158	1202.2710		2038.8970
3226.2590		2749.1730	1983.5640		2648.2950
764.8752		176.7767	581.0034		912.3755
1295.3330		81.0494	484.3222		2914.0530
		1415.1020			4286.5010
		1530.5230			1983.1770
		515.9235			679.1178
		859.9982			1860.2820
		2564.2340			1466.4140

ANOVA Summary

Source	Mean: Samples 1,2 & 3	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Riley Ridge	1760.7774	0.093	2.44	3.11	4482266	2241133	2
	1832.7655				73430548	917881	80
	1310.8488						
Riley Ridge Cont.	1265.5042	0.119	2.18		4694336	2347168	2
	1678.0207						
	1758.2533				86001756	1075021	80

Table 6 continued:
ANOVA Test for Trail Route Segments

Sample 1: Prehistoric Archaeological Sites n=35, Sample 2: Historical Archaeological Sites n=8; Sample 3: 40 Random Points

Packsaddle Segment 1			Packsaddle Segment 2		
Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
1814.8590	1070.8190	3116.7640	2290.0220	1046.9270	2709.6110
1876.0940	2090.9240	2115.4530	2308.5890	1676.0500	2556.7020
2311.9160	2635.3960	3003.2560	2088.7670	2412.5830	2594.4710
1215.2550	1996.3290	3742.4460	1204.1200	1857.6680	3523.6490
533.9036	2019.3190	4534.6700	1007.4290	2258.8400	4362.5300
2260.8800	2261.9660	1550.1000	2176.4710	1774.2890	1380.9130
911.2596	1140.4000	348.7363	1383.5600	1455.4820	306.1062
687.6315	859.3079	1274.3980	1156.0360	1206.2360	1640.6950
1112.8700		1053.0570	979.5611		1003.3070
1599.1350		1004.4150	2013.6920		1160.0840
2019.3190		1746.1990	2258.8400		1585.9900
790.7370		890.2949	1188.0830		1361.3230
665.7702		781.3962	985.6495		295.6653
1719.6430		1591.6520	2192.6940		1918.7600
1371.1110		940.7896	1511.4460		912.3382
1065.3570		1605.0170	1193.4690		1239.9270
1550.1890		67.8823	2028.8540		157.4706
1319.8700		4653.4140	1331.3170		4463.9500
1310.7220		2350.8880	1168.4770		2710.3650
2261.9660		860.5655	1774.2890		1198.2870
1113.8480		1634.4310	714.2023		1317.9750
816.5415		2264.5480	816.5011		1890.4160
944.1102		3904.9210	1362.1250		3551.4350
997.1083		693.6981	1333.6720		985.0249
1140.4000		510.4214	1455.4820		911.8032
560.4400		1675.8400	917.7985		2143.2010
1965.4400		2876.9690	1570.2090		2709.9830
859.3079		1201.3700	1206.2360		817.2466
3584.4450		2406.9610	3327.5160		2171.3240
3663.6820		2465.4830	3424.1680		2427.1980
2637.3190		3421.6360	3082.5100		3266.5480
1931.8120		2579.5160	2278.0560		2335.0110
2789.9200		1880.8640	3241.9410		1583.1440
200.2324		1644.0680	195.0000		1578.0910
1180.9220		3418.8800	1502.1470		3130.0360
		4558.8380			4162.0360
		2902.6240			2868.3080
		934.7326			802.7179
		2644.0270			2543.8410
		2249.7310			2671.5870

ANOVA Summary

Source	Mean: Samples 1,2 & 3	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Pack-saddle Seg 1	1508.1147	0.057	2.96	3.11	6072150	3036075	2
	1759.3076				82119384	1026492	80
	2077.5238						
Pack-saddle Seg 2	1676.2551	0.257	1.38		2417624	1208812	2
	1711.0094						
	2023.7268				702097355	877621	80

Table 6 continued:
ANOVA Test for Trail Route Segments

Sample 1: Prehistoric Archaeological Sites n=35, Sample 2: Historical Archaeological Sites n=8; Sample 3: 40 Random Points

Packsaddle Segment 3			Packsaddle Segment 4		
Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
1044.9920	1327.1820	3621.1610	2742.1280	1225.6920	2671.6490
51.6140	2596.6210	1485.4670	2603.4150	1638.0370	3022.9350
2757.0860	2719.8390	3507.9200	2066.2360	2294.8050	2556.4050
1246.2620	2057.9240	4171.8290	1177.2550	1757.5940	3500.5030
50.4480	1907.3670	4930.9480	1420.3170	2674.7850	4341.2540
2130.9250	2721.5620	1986.0720	2086.5370	1693.8150	1361.9640
308.7685	437.2928	587.4504	1838.0490	1668.8320	518.5219
300.7607	804.2698	285.7219	1612.6530	1667.8410	1876.0450
1255.9530		1442.6400	907.6255		1019.2670
2.0000		818.9066	2288.1970		1294.6490
1907.3670		2171.5550	2674.7850		1567.0280
327.9634		5.6569	1487.9440		1762.1450
666.3212		1263.1580	1445.9980		246.0081
569.0035		1348.8620	2578.4800		2369.9470
1396.6000		1236.9260	1897.6220		1072.0250
1097.0510		2105.8420	1588.2580		1208.1510
768.2142		408.5903	2476.4920		621.3896
1293.2520		5060.1320	1314.3660		4441.8550
1743.6800		1936.4720	1151.5020		3166.7730
2721.5620		827.3724	1693.8150		1658.5040
1474.2860		2124.1250	581.3820		1291.0570
909.0242		2542.6520	854.9415		1757.6010
147.7058		4120.4410	1676.1290		3418.8330
412.2839		700.8745	1567.4190		1440.5180
437.2928		490.1102	1668.8320		1378.6970
284.4293		497.3138	1207.4580		2513.8630
2469.5670		3284.1030	1534.4380		2689.5400
804.2698		1540.8780	1667.8410		684.8336
4035.1600		2856.8750	3302.7990		2148.1340
4104.9180		2760.3030	3400.1530		2459.0850
1969.7130		3815.2670	3548.4070		3246.3300
1589.7070		3031.6990	2732.4370		2311.2920
1998.9370		2079.1660	3706.6080		1458.9960
559.9178		2019.6240	607.0132		1563.7540
1053.4060		3885.6190	1955.5580		3102.8610
		5060.6640			4124.5990
		3168.5920			2918.7400
		1386.1490			788.4092
		3012.4460			2526.4810
		1673.0360			3138.4250

ANOVA Summary

Source	Mean: Samples 1,2 &3	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Pack-saddle Seg 3	1254.0126	**0.003**	**6.01**	3.11	17844398	8922199	2
	1821.5072				118723098	1484038	80
	2231.3155						
Pack-saddle Seg 4	1916.0883	0.0509	0.68		1159927	579963	2
	1827.6751						
	2130.9767				68671993	858399	80

Table 6 continued:
ANOVA Test for Trail Route Segments

Sample 1: Prehistoric Archaeological Sites n=35, Sample 2: Historical Archaeological Sites n=8; Sample 3: 40 Random Points

Packsaddle Segment 5			Packsaddle GPS Segment		
Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
2980.9500	1435.4850	1709.6150	2779.7110	1372.2180	2633.2490
2797.1160	706.3207	3278.9480	2604.0280	1603.4620	3084.9760
1579.7190	2275.4480	1594.0800	2134.3750	2231.4120	2517.5290
1283.1360	1783.2900	2886.5080	1150.4180	1705.7010	3558.6570
1639.6260	2939.1890	3790.4130	1436.6210	2791.3420	4416.2200
2124.1050	895.1157	1150.3830	2038.1580	1590.7040	1467.6120
2081.3380	1850.5880	721.5157	1881.6830	1666.4370	521.8448
1858.6280	1933.7850	2062.4040	1660.1280	1754.5150	1874.7170
987.5890		1150.0400	870.0264		1163.4650
2479.8080		1457.9040	2288.2190		1288.9750
2939.1890		1324.1770	2791.3420		1671.0250
1687.6900		1970.2330	1490.3100		1767.6010
1712.2770		78.0064	1534.4630		188.4728
2783.8740		2637.8510	2582.7550		2467.3750
2157.3830		1280.9220	2022.3650		1218.7600
1850.6870		573.2827	1709.8260		1218.8200
2712.0270		879.8801	2510.2110		693.1089
1421.2530		3851.8370	1288.2430		4509.1870
1054.7500		3434.2440	1274.4510		3259.4140
895.1157		1924.9030	1590.7040		1747.0210
505.8903		776.4619	502.4938		1328.0760
1000.6170		1654.3840	844.8130		1677.8390
1876.3290		3298.6200	1678.6880		3340.3860
1755.3760		1707.8090	1566.3950		1534.0030
1850.5880		1638.2620	1666.4370		1449.0670
1408.5570		2717.8260	1210.2780		2517.7300
676.0185		2250.7250	1516.4340		2775.3640
1933.7850		616.4454	1754.5150		608.5063
2616.7250		1616.9250	3343.9620		2209.3800
2746.6730		2375.4380	3449.2090		2599.6280
3803.3650		2786.4350	3608.4570		3333.1820
3000.1300		1734.9130	2827.1200		2366.3570
3959.0280		1422.6800	3762.5060		1390.9580
875.0092		1481.9890	712.9243		1700.2570
2223.2500		2359.1430	2051.0240		3130.0860
		3160.4240			4087.6700
		2837.3510			3060.3780
		872.2775			926.1539
		2257.8110			2639.6200
		3399.2250			3209.6580

ANOVA Summary

Source	Mean: Samples 1,2 & 3	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Pack-saddle Seg 5	1978.7866	0.764	0.27	3.11	448728	219207	2
	1727.4027				63941207	799265	80
	1968.0573						
Pack-saddle GPS	1946.6655	0.452	0.8		1391696	695848	2
	14715.791						
	2178.8082				70000739	875009	80

Table 7:
T-Test for Selected Trail Route Segments

Sample 1: Historic(8) or Prehistoric (35) Archaeological Sites 2: 40 Random Points

Settler's Road Prehistoric	**Random**	**Settler's Road Historic**	**Riley Ridge Prehistoric**	**Random**	**Riley Ridge Historic**
4062.0810	995.2010	1956.6540	2484.0020	866.4468	9.8995
3491.8340	4391.6520	15.2316	2935.9010	2535.5140	909.1144
1103.6830	880.3602	942.9894	143.4015	872.3222	3570.6190
1597.1740	2214.2200	1291.5100	2267.6270	748.8257	2987.1790
2707.8230	3130.9250	3722.2060	1579.4690	1621.6760	1726.3300
1479.2860	1154.0000	14.0000	3287.2590	118.5327	2013.2210
3221.8140	1820.2760	2525.4330	1673.3900	1345.6200	2279.1330
3023.0300	2749.1710	2981.6480	1477.7020	2402.3670	1166.6280
1346.1540	1534.8810		2090.8270	244.8060	
3176.0700	2069.8000		2688.4560	2120.9150	
3722.2060	1192.7490		1726.3300	36.7967	
2572.0420	2961.9010		1915.2670	1904.7290	
2766.0740	1223.1320		1006.9500	1277.2360	
3665.0690	3591.8180		2669.3560	1628.6690	
2928.8660	1855.6220		927.0523	129.0039	
2690.9120	516.9623		714.5831	762.8191	
3785.2870	2052.4160		2280.5060	948.0338	
1677.6250	3172.8510		2385.9260	1617.0250	
1250.1010	4388.7750		258.6445	2406.2470	
14.0000	2964.8410		2013.2210	1141.8100	
937.0000	660.2424		1861.2200	555.7814	
1672.5840	262.8650		1868.8340	3012.5190	
2743.4380	216.0046		2047.6430	4604.8750	
2503.7600	2739.3320		2134.9440	952.7329	
2525.4330	2764.7360		2279.1330	1138.2250	
2349.4690	3574.0090		1699.6900	2654.6350	
179.7248	1721.4960		791.0455	631.1592	
2981.6480	867.2191		1166.6280	1971.0290	
1915.5610	1094.6160		385.5191	77.4919	
2058.0410	2181.8220		555.1802	1079.7370	
4917.1870	2207.5840		3042.4010	1064.4780	
3956.0810	1156.6540		1982.6350	69.1158	
5087.8710	765.4241		3226.2590	2749.1730	
1957.5300	1502.6340		764.8752	176.7767	
3210.3660	1637.5440		1295.3330	81.0494	
	2447.6360			1415.1020	
	2588.9780			1530.5230	
	1338.5920			515.9235	
	1853.4710			859.9982	
	4470.2190			2564.2340	

Summary

Source	Mean Samples 1&2	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Settlers (Prehist)	2550.7664	0.0517	3.91	3.97	777968	777968	1
	2022.8158				62248238	1353222	73
Settlers (Hist)	2589.6368	0.454	0.57	4.05	5202994	5202994	1
	2022.8158				97152324	1330922	46
Riley (Prehist)	1760.7774	**0.0416**	**4.3**	**3.97**	3778800	3778800	1
	1310.8488				64214895	879656	73
Riley (Hist)	1832.7655	0.197	1.71	4.05	1815979	1815979	1
	1310.8488				48841415	1061769	46

Table 7 continued:
T-Test for Selected Trail Route Segments

Sample 1: Historic (8) or Prehistoric (35) Archaeological Sites 2: 40 Random Points

Packsaddle Segment 1			**Packsaddle Segment 3**		
Prehistoric	**Random**	**Historic**	**Prehistoric**	**Random**	**Historic**
1814.8590	3116.7640	1070.8190	1044.9920	3621.1610	1327.1820
1876.0940	2115.4530	2090.9240	51.6140	1485.4670	2596.6210
2311.9160	3003.2560	2635.3960	2757.0860	3507.9200	2719.8390
1215.2550	3742.4460	1996.3290	1246.2620	4171.8290	2057.9240
533.9036	4534.6700	2019.3190	50.4480	4930.9480	1907.3670
2260.8800	1550.1000	2261.9660	2130.9250	1986.0720	2721.5620
911.2596	348.7363	1140.4000	308.7685	587.4504	437.2928
687.6315	1274.3980	859.3079	300.7607	285.7219	804.2698
1112.8700	1053.0570		1255.9530	1442.6400	
1599.1350	1004.4150		2.0000	818.9066	
2019.3190	1746.1990		1907.3670	2171.5550	
790.7370	890.2949		327.9634	5.6569	
665.7702	781.3962		666.3212	1263.1580	
1719.6430	1591.6520		569.0035	1348.8620	
1371.1110	940.7896		1396.6000	1236.9260	
1065.3570	1605.0170		1097.0510	2105.8420	
1550.1890	67.8823		768.2142	408.5903	
1319.8700	4653.4140		1293.2520	5060.1320	
1310.7220	2350.8880		1743.6800	1936.4720	
2261.9660	860.5655		2721.5620	827.3724	
1113.8480	1634.4310		1474.2860	2124.1250	
816.5415	2264.5480		909.0242	2542.6520	
944.1102	3904.9210		147.7058	4120.4410	
997.1083	693.6981		412.2839	700.8745	
1140.4000	510.4214		437.2928	490.1102	
560.4400	1675.8400		284.4293	497.3138	
1965.4400	2876.9690		2469.5670	3284.1030	
859.3079	1201.3700		804.2698	1540.8780	
3584.4450	2406.9610		4035.1600	2856.8750	
3663.6820	2465.4830		4104.9180	2760.3030	
2637.3190	3421.6360		1969.7130	3815.2670	
1931.8120	2579.5160		1589.7070	3031.6990	
2789.9200	1880.8640		1998.9370	2079.1660	
200.2324	1644.0680		559.9178	2019.6240	
1180.9220	3418.8800		1053.4060	3885.6190	
	4558.8380			5060.6640	
	2902.6240			3168.5920	
	934.7326			1386.1490	
	2644.0270			3012.4460	
	2249.7310			1673.0360	

Summary

Source	Mean Samples 1&2	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Pack Seg 1 (Prehist)	1508.1147	**0.0208**	**5.58**	**3.97**	6052231	6052231	1
	2077.5238				79198370	1084909	73
Pack Seg 1 (Hist)	1759.3076	0.474	0.52	4.05	675077	675077	1
	2077.5238				59309607	1289339	46
Pack Seg 3 (Prehist)	1254.0126	**0.001**	**11.49**	**3.97**	17828924	17828924	1
	2231.3155				113246755	1551325	73
Pack Seg 3 (Hist)	1821.5072	0.431	0.63	4.05	1119618	1119618	1
	2231.3155				81660851	1775235	46

Table 7 continued:
T-Test for Selected Trail Route Segments

Sample 1: Historic (8) or Prehistoric (35) Archaeological Sites 2: 40 Random Points

Settler Continuation			**Packsaddle Segment 5**		
Prehistoric	**Random**	**Historic**	**Prehistoric**	**Random**	**Historic**
4087.1340	841.5331	1498.9400	2980.9500	1709.6150	1435.4850
4353.8200	4127.1390	67.4240	2797.1160	3278.9480	706.3207
1.0000	729.1783	3279.9650	1579.7190	1594.0800	2275.4480
2779.2520	438.4165	3030.4170	1283.1360	2886.5080	1783.2900
3041.6350	1230.3390	3116.0010	1639.6260	3790.4130	2939.1890
3382.3340	619.3585	1123.2780	2124.1050	1150.3830	895.1157
3249.4830	2264.5390	3418.8960	2081.3380	721.5157	1850.5880
3037.9760	3628.4790	2771.4880	1858.6280	2062.4040	1933.7850
2458.9440	1188.8310		987.5890	1150.0400	
4040.2450	3022.7180		2479.8080	1457.9040	
3116.0010	459.9130		2939.1890	1324.1770	
3231.8090	3394.5400		1687.6900	1970.2330	
2602.0160	1486.9650		1712.2770	78.0064	
4207.7540	3175.9500		2783.8740	2637.8510	
2410.9360	1487.0860		2157.3830	1280.9220	
2289.7310	597.9674		1850.6870	573.2827	
3875.7260	2208.3110		2712.0270	879.8801	
2912.7810	1208.5710		1421.2530	3851.8370	
858.3432	3900.1050		1054.7500	3434.2440	
1123.2780	2746.9200		895.1157	1924.9030	
1788.2380	574.8191		505.8903	776.4619	
2556.9560	2356.0410		1000.6170	1654.3840	
3418.0840	3737.7320		1876.3290	3298.6200	
3320.1150	2551.5790		1755.3760	1707.8090	
3418.8960	2702.4070		1850.5880	1638.2620	
2950.0040	4176.3010		1408.5570	2717.8260	
222.8004	38.0789		676.0185	2250.7250	
2771.4880	1854.8990		1933.7850	616.4454	
80.0562	108.2266		2616.7250	1616.9250	
244.3808	835.0239		2746.6730	2375.4380	
4622.2370	493.5838		3803.3650	2786.4350	
3504.9270	261.2049		3000.1300	1734.9130	
4809.5930	2490.1730		3959.0280	1422.6800	
2037.3940	749.2162		875.0092	1481.9890	
2885.8940	95.6034		2223.2500	2359.1430	
	1583.4800			3160.4240	
	981.2242			2837.3510	
	1212.4340			872.2775	
	275.2889			2257.8110	
	4134.794			3399.2250	

Summary

Source	Mean Samples 1&2	P-Value	F-Value	F-Critical $\alpha = 0.05$	SS Between Groups Within Groups	MS	df
Settler Cont (Prehist)	2734.036	**0.0015**	**10.77**	**3.97**	18103946	18103946	1
	1749.2242				122656549	1680226	73
Settler Cont (Hist)	2288.3011	0.289	1.15	4.05	1937359	1937359	1
	1749.2242				77607734	1687124	46
Pack Seg 5 (Prehist)	1978.7886	1.00	0	3.97	2149	2149	1
	1968.0573				60291009	825904	73
Pack Seg 5 (Hist)	1727.4027	0.505	0.45	4.05	386097	386097	1
	1974.684				39782387	864834	46

Chapter 10: Results

The investigation of a trail from Hopland to Lakeport has uncovered three routes crossing the HREC, branching off at the northwest end of Benmore Valley from a trail that stretches for most of the length of Benmore Valley. There is also a statistical probability that the distribution of nearby archaeological sites may be non-random with respect to one or more of the segments of these routes.

Summary of Statistical Results

As described in Chapter 9, the distance from each archaeological site and random point to each trail route segment was recorded. The object of the test was to support or disprove the null hypothesis: that the archaeological sites were randomly located with respect to the trail segments. A T-Test was run for each segment using the two groups of 40 points: archaeological and random. Then, the archaeological points were subdivided into a set of 35 prehistoric and 8 historic points (with overlap of types) and a One Way Analysis of Variation (ANOVA) was calculated for each segment using these two sets of points and the 40 randomly generated points. Table 8 below summarizes the raw data results found in Chapter 9.

In both the T-Test and the ANOVA test, two segments, the Settler's Road Continuation and Packsaddle horse trail segment 3, showed a $\geq$ 95% statistical probability that the archaeological sites are not randomly located, and are related to the trail segment. For some other trail segments, the statistical probability was at least 90%

confidence of a relationship ($P \leq 0.1$). I had proposed a confidence threshold of 95% for the test, but these results were significant enough to merit an additional test. For all results of the ANOVA test which resulted in $P \leq 0.1$, a second set of T-Tests were run, using the 40 random points as one sample group, and historic and prehistoric sites, in turn, as the second group. The purpose of this second T-Test was to determine which set of archaeological points contributed to the higher probabilities.

Table 8: The summary statistical results from the T-Test and ANOVA test. Tests in **Bold** represent results with at least 95% confidence for a relationship between archaeological sites and the trail segment ($P \leq 0.05$). See Tables 5 and 6 in Chapter 9 for the raw results.

Trail Section	**T-Test** **Two Groups: Archaeological Sites and Randomly Generated Points**	**ANOVA** **Three Groups: Prehistoric, Historic Sites, and Randomly Generated Points**
Settler's Road	P = 0.172, F = 1.9	P = 0.066, F = 2.8
Settler Continuation	**P = 0.006, F = 7.97**	**P = 0.006, F = 5.45**
Riley Ridge Route	P = 0.558, F = 3.77	P = 0.093, F = 2.44
Riley Ridge Continuation	P = 0.118, F =2.49	P = 0.119, F = 2.18
Packsaddle Segment 1	**P= 0.046, F = 4.11**	P = 0.057, F = 2.96
Packsaddle Segment 2	P = 0.169, F = 1.93	P = 0.257, F = 1.38
Packsaddle Segment 3	**P = 0.0054, F =8.33**	**P = 0.003, F = 6.01**
Packsaddle Segment 4	P = 0.348, F = 0.89	P = 0.509, F = 0.68
Packsaddle Segment 5	P = 0.920, F = 0.01	P = 0.764, F = 0.27
Packsaddle GPS	P = 0.306, F = 1.06	P = 0.452, F = 0.8

Settler's Road, Settler's Road Continuation, Riley Ridge Route, and Packsaddle horse trail segments 1 and 3 were retested with the T-Test, with Packsaddle horse trail segment 5 (23.6% confidence with the ANOVA test) as a comparison. The Settler's Road, and Packsaddle horse trail segment 5 (as expected) returned a lower probability of

relationship, but all other trail segments showed a confidence level of relationship ≥ 95% for the prehistoric archaeological sites, but not for the historic sites. For the trail segments Setter Continuation and Packsaddle horse trail segment 3, the statistical probability of a relationship exceeds 99%. The results for the Settler's Road were much higher when the prehistoric sites were compared without the historic sites (original P=0.172, prehistoric only P=0.0517), missing the 95% threshold, but still of interest.

Table 9: Summary T-Tests for selected trail route segments where previous tests P<= 0.1. Tests in **Bold** represent results with at least 95% confidence for a relationship between prehistoric archaeological sites and the trail segment (P ≤ 0.05). See Table 7 in Chapter 9 for the raw results.

Trail Section	P-Value	F-Value	F-critical
Settler's Road (Prehist)	0.0517	3.91	3.97
Settler Continuation (Prehist)	**0.0015**	**10.77**	**3.97**
Riley Ridge Route (Prehist)	**0.0416**	**4.3**	**3.97**
Packsaddle Segment 1 (Prehist)	**0.0208**	**5.38**	**3.97**
Packsaddle Segment 3 (Prehist)	**0.001**	**11.49**	**3.97**
Packsaddle Segment 5 (Prehist)	1.00	0.0	3.97
Settler's Road (Hist)	0.454	0.57	4.05
Settler Continuation (Hist)	0.289	1.15	4.05
Riley Ridge Route (Hist)	0.197	1.71	4.05
Packsaddle Segment 1 (Hist)	0.474	0.52	4.05
Packsaddle Segment 3 (Hist)	0.431	0.63	4.05

From these tests, I concluded that all three routes have some statistical relationship to the selected archaeological sites, particularly the prehistoric sites. The probability of a relationship with the historical archaeological sites is insignificant when

these sites are not included with the prehistoric sites in one sample. The lack of temporal data for most of the prehistoric sites precludes an estimate of the age of the trail beyond the general time period “prehistoric”.

Chapter 11: Discussion

The results of the statistical tests showed that there was a probability that some archaeological sites, particularly prehistoric sites, were not randomly located with respect to some of the trail segments. In some cases, the statistical probability was very high. Statistical results are not proof, but it is very probable that these three routes constitute part of the "The Trail from Hopland to Lakeport" from their association with prehistoric sites in the study area, and documented use as wagon and packhorse routes in early historic times.

The relationship of prehistoric sites to trail suggests that the trail routes were in use during prehistoric times, but it is difficult to say how old the trails may be, because little diagnostic material has been found at most of the sites labeled "prehistoric". The best documented sites in the HREC area are the Rockpile site (CA-MEN-852), and two other nearby sites (CA-MEN-2216 and HREC-9), which could be 3000 years old, based on obsidian hydration. However, based on point typologies, the presence of Houx Contracting Stem projectile points suggests a date as early as 7000 B.P. (Wise-Harthorn 2003:21). This is not enough temporal data to speculate on the age of the trail routes. The question of age is very interesting, however, because an earlier date could place their origins with the people who inhabited the Russian River Valley before the Pomoan people arrived, as suggested by linguistic data, around 1500 years ago (Golla 2007:79).

Because of the obvious reuse of the trails by settlers, I expected to see correlation with historic sites as well, but this was not confirmed by the statistical tests. Trails are not static. The "Trail from Hopland to Lakeport" was in use in the modern era, although the strongest relationship appears to be with prehistoric sites. Modern Pomo people were witnessed using one of the trail routes, which suggests continuity of trail use. A series of trails probably existed long before European Contact, and the routes changed as conditions warranted. The historic background evidence for the trail dates from 1851 to the present. However, statistical probability and a small amount of temporal data suggest the trails originated in the broad period of "prehistory".

Management Considerations for Landscapes

Figure 16 shows some of the myriad of roads and trails on the HREC. All of those roads with the exception of University Road are unpaved. The staff of the HREC is charged with maintaining the facility for research purposes, and to consider any project in light of the effect it might have on other resources and projects. The long- term survival of the extant trail segments of the Trail from Hopland to Lakeport which exist on the HREC will be assured, now that it is understood that there are documented routes.

A problem land managers face is how to manage cultural resources that exist on such a large scale. The study of trails, paths and roads are essential to the understanding of past, but trails are not constrained by management boundaries. Tangible physical evidence may be poorly preserved or missing. The age is difficult to determine. To

paraphrase Trombold (1991), how can one study a trade network if the actual route is unknown? Once convinced of the value of studying a trail, one must also be convinced to study the in-between areas, look beyond modern boundaries, and to count the evidence of human activity as important to the context of the trail as well.

What are the ways in which we can study, manage and protect trails? We can study trails as built environment (as Trombold's (ed. 1991) volume suggests). We can apply landscape theory to trails and roads as suggested by Snead et al. (2009). A landscape approach allows us to consider the context of the trail and the landscape it passes through. The significance is in the context and the route. If we don't understand the entire meaning, we still have the scale, patterns, context and associations. The study of trails as landscape is a work in progress.

As for the management of the trail, there are frameworks for management, even if they were not designed with trails in mind. Sometimes agencies and land managers can develop a memorandum of agreement to manage a trail as a unit across agency or political boundaries. Traditional site recordation can be used to record the trail. California State agencies, including universities, are required to evaluate their undertakings under CEQA if the resource that will be affected is listed in or eligible for the California Register (14 CCR Section 4850). Evaluation under the criteria of Section 106 of the National Historic Preservation Act, As Amended (ACHP 2009), for inclusion into the National Register of Historic Places, or, listed as a World Heritage site, is also appropriate. An example of an aboriginal trail with historic documentation, which has

been successfully nominated to the National Register of Historic Places is the Bad Pass Trail in Montana, with significance from 7000 B.C. to 1849 (NPS N.D.). The National Trails System Act of 1968, As Amended (NPS 2010), was designed to provide for outdoor recreation and institute "a system of recreation, scenic and historic trails" for the enjoyment of the public (16 USC 1241). For a trail to be designated a "national historic trail" the trail must meet three criteria, including the potential for "public recreational use or historic interest" (16 USC 1241 Sec. 5. (b)(11)). These laws do not preclude the continued use of trails, and actually encourage their use for recreation and interpretation.

Future Directions for Research

This thesis has uncovered several potential avenues for future research in the thesis area. First, although the HREC facility has been covered by pedestrian survey in the past, a new survey, based on the examination of corridors focusing on the three trail routes is recommended. Segments 1 and 3 of the Packsaddle, the Riley Ridge Route and the continuation of the Settler's Road, had the strongest confidence level for a non-random relationship to prehistoric sites. Much of the Riley Ridge Route and the "Packsaddle" horse trail are invisible to the unaided eye due to the processes of geomorphology and time. Newer technology such as Light Detecting and Ranging (LiDAR) might be able to highlight trail segments hidden in the grass and under trees. Packsaddle Crossing is named for a saddlebag that once hung on a tree near the crossing. A metal detector might find the remains of the bag, as it was said to have contained nails (Robert Keiffer, pers. com. 2010).

Careful limited excavation in the study area, and hydration tests on selected artifacts within the existing HREC collection, may result in more temporal data that could result a better approximation of trail age. Given more temporal data, archaeological sites could be divided into groups based on their approximate age for a new statistical analysis.

The HREC may choose to interpret some, or all, of the study area portion of the trail as part of their ongoing educational effort, perhaps in partnership with the Hopland Rancheria, whose Tribal Historical Preservation Officer is very interested in the archaeological research at the HREC.

Outside of the HREC boundaries, the rest of the possible route is on private property, most of which was not visited during the conducting of the thesis research except for the Poor Ranch. If landowners permit, walking and surveying both the old Foster property and the eastern end of the trail from Benmore Valley through Scotts Creek could add to the existing knowledge of the trail.

Formal oral history interviews of people who might have knowledge of the trail and its use were not conducted. However, conversations with a few local ranchers and residents demonstrated that there is considerable knowledge of the network of trails and roads in the Mayacmas Mountains. This exercise would be a worthwhile activity for someone interested in the regional history.

The route of the settler's road and the HREC could be a fruitful area of survey and investigation for an archaeologist interested in small scale ranching between the 1850s and the 1940s, and the economy of Mendocino County and the greater Bay Area. Just as the trails and roads of the study area permitted the small scale movement from the study area to the towns along the Russian River, railroads linked southern Mendocino County with the greater Bay Area and made it possible for local agricultural products and wood to be sent to market in metropolitan areas to the south.

During the course of this thesis study, I also attempted to model the trail segments using least cost path analysis with ESRI ArcGIS 9.3.1. Background research lead me to believe that I had a reasonable expectation of success for determining least cost paths, based on topography models, which would have approximated the known trail segments. My results were disappointing. I was able to approximate one known segment (the Settler's Road) for a distance across the north part of the HREC only when I used starting and destination points that isolated just this one segment from the rest of the trail. I found a poor match with the other segments except in predictable locations where the routes probably followed Parsons Creek.

The body of knowledge about past climate, vegetation, boundaries and other criteria that past people may have used for decision making is too general at present, in the thesis study area, to allow a GIS application to approximate the cognitive processes of past peoples. Until software algorithms and research into the natural and cultural history of the southern North Coast Ranges improves considerably, I would not recommend a

repeat of this exercise. I am very hopeful that in the future, this situation will change. In the meantime, I highly recommend that historians and archaeologists conduct an oral history project across the Lake-Mendocino Counties area, for there are many more accounts like those of Francisco John and John Poor to be recorded.

Chapter 12: Conclusion

The goal of this thesis was to find the Trail from Hopland to Lakeport and to document its presence through historical, geographical, archaeological, ethnographical evidence and local knowledge. All of these methods were employed to locate the route of the trail through the HREC study area. Three routes were found. All have evidence for their use post European contact and statistically, in prehistoric time. The existence of three routes is not surprising due to the changes in population and settlement in prehistory and during the disruption came about starting in 1844 with the arrival of Mexican grantee, Fernando Féliz, because the purpose of trails is to bind people and places together.

The study area is a part of a larger network of trails and paths between the tribelets of southern Mendocino County, Clear Lake and beyond, which is to say the study area is part of a landscape of movement. As hypothesized by others, the trails across the HREC demonstrate how paths can be appropriated and reused over time. Meanings change with the needs of the people using the trail, and sometimes a trail fades into the grass. However, the context of a trail can change, deepen and be enriched by the stories of the people who live and move across the landscape.

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