An Archaeological Inventory Survey of the Lālāmilo Wind Farm Repowering Project

TMKs: (3) 6-6-01:002 (por.), 071, and (3) 6-8-01:001 (por.)

Lālāmilo and Waikōloa *ahupua'a*
South Kohala District
Island of Hawai'i

FINAL VERSION

Prepared By:

Matthew R. Clark, B.A.,
Ashton K. Dircks Ah Sam, B.A.,
Lauren M. U. Kepa'a,
and
Robert B. Rechtman, Ph.D,

Prepared For:

Lālāmilo Wind Company, LLC
55-310 Upolu Airport Road
Hawi, HI 96710

April 2014 (Revised September 2014)

ASM affiliates
Archaeology • History • Ethnography • Architectural History
Office: (808) 969-6066 • Fax: (808) 443-0065

ASM Project Number 21850

An Archaeological Inventory Survey of the Lālāmilo Wind Farm Repowering Project

TMKs: (3) 6-6-01:002 (por.), 071, and (3) 6-8-01:001 (por.)

Lālāmilo and Waikōloa *ahupua'a*
South Kohala District
Island of Hawai'i

ASM affiliates

EXECUTIVE SUMMARY

At the request of Lālāmilo Wind Company, LLC, ASM Affiliates, Inc. conducted an archaeological inventory survey of approximately 87.5 acres for the Lālāmilo Wind Farm Repowering Project in the *ahupua'a* of Lālāmilo and Waikōloa, South Kohala District, Island of Hawai'i. The proposed development of the Lālāmilo Wind Farm will occur on parcels and easements in Lālāmilo Ahupua'a (TMKs: (3) 6-6-01:002 (por.) and 071; Figure 2) that are owned by the State of Hawai'i and were originally created for an earlier wind farm which operated on the premises between 1985 and 2010, but has since been removed. Construction of the new wind energy generation system will supply electricity to four existing County of Hawai'i, Department of Water Supply (DWS) wells in Lālāmilo Ahupua'a (Lālāmilo wells A, B, C, and D) that were formerly connected to the Lālāmilo Wind Farm (between 1985 and 2010), and four existing Parker Ranch wells (Parker wells No. 1, 2, 3, and 4) in Waikōloa Ahupua'a. Connecting the existing Parker wells to the new wind farm equipment will require the installation of new power lines within an access easement across TMK: (3) 6-8-01:001 (por.), owned by the Richard P. Smart Trust. Two previous archaeological studies, one for the earlier wind farm in Lālāmilo Ahupua'a (Soehren 1984) and one for the Parker wells in Waikōloa Ahupua'a (Rosendahl 1992a, 1992b), have included portions of the current project area.

Archaeological fieldwork for the current project was conducted on March 19 and 20, 2014, and as a result three archaeological sites, a rock wall (SIHP Site 9012), a World War II military encampment with a possible earlier Precontact component (SIHP Site 30109), and a complex of cairns marking the boundary between Lālāmilo and Waikōloa *ahupua'a* (SIHP Site 30110), were recorded within the project area. Site 9012 is a late nineteenth/early twentieth century dry-stacked rock wall that whose construction is attributed to Parker Ranch. As such this site is associated with significant events important in Hawaiian history, and is evaluated as significant under Criterion A. This site is also considered significant under Criterion D for its research value. The current proposed project will have no effect on this site as the wall has an existing gated breach at the current access easement, and the continued preservation of this site is the recommended treatment. Site 30109 is a WWII-era military encampment associated with training activities conducted within the greater Camp Tarawa Waikoloa Maneuver Area. Some of the features of the encampment, which occurs in the lee of a prominent ridge formation, may have been previously occupied during the earlier Historic Period or Precontact Period for temporary habitation purposes, and then reutilized for military purposes. This site, because of its association with World War II, reflects activities that when considered in their totality were important locally, nationally, and ultimately globally; and as such this site is considered significant under Criterion A. It is also considered significant under Criterion D for its historical research value. Although this site will not likely be directly impacted by the proposed wind farm construction activities, it may be indirectly impacted by increased use of the area; however, the thorough documentation of this site during the current study has mitigated such potential impacts and no further work is the recommended treatment. Site 30110 is a series of Historic/Modern boundary markers that are considered significant under Criterion D. This site has been fully and comprehensively documented as a result of the current study and no further work is the recommended treatment.

CHAPTERS

Page

FIGURES

Page

Page

Page

TABLES

Page

1. INTRODUCTION

At the request of Lālāmilo Wind Company, LLC, ASM Affiliates, Inc. conducted an archaeological inventory survey of approximately 87.5 acres for the Lālāmilo Wind Farm Repowering Project in the *ahupua'a* of Lālāmilo and Waikōloa, South Kohala District, Island of Hawai'i (Figure 1). The proposed development of the Lālāmilo Wind Farm will occur on parcels and easements in Lālāmilo Ahupua'a (TMKs: (3) 6-6-01:002 por. and 071; Figure 2) that are owned by the State of Hawai'i and were originally created for an earlier wind farm which operated on the premises between 1985 and 2010, but has since been removed. Construction of the new wind energy generation system will supply electricity to four existing County of Hawai'i, Department of Water Supply (DWS) wells in Lālāmilo Ahupua'a (Lālāmilo wells A, B, C, and D) that were formerly connected to the Lālāmilo Wind Farm (between 1985 and 2010), and four existing Parker Ranch wells (Parker wells No. 1, 2, 3, and 4) in Waikōloa Ahupua'a (Figure 3). The current proposed re-development of the wind farm will include the placement of five Vestas V47-660 kW wind turbines with a maximum height at the top of the blade of 198.5 feet (60.5 meters) above ground level. The five proposed turbines will be arranged in two arrays, consisting of two and three turbines, respectively. Connecting the existing Parker wells to the new wind farm equipment will require the installation of new power lines within an access easement across TMK: (3) 6-8-01:001 (por.), owned by the Richard P. Smart Trust. The proposed Lālāmilo Wind Farm Repowering Project will also utilize an existing facility that is located on TMK: (3) 6-6-01:076 (see Figure 2), but the use of this facility will only involve the pulling of cable through existing underground conduits and the overhead connecting of power lines on existing infrastructure. No new ground disturbance will occur within Parcel 076, thus this parcel was not included in the current archaeological study. Two previous archaeological studies, one for the earlier wind farm in Lālāmilo Ahupua'a (Soehren 1984) and one for the Parker wells in Waikōloa Ahupua'a (Rosendahl 1992a, 1992b), have included portions of the current project area. As a result of the current study three archaeological sites, a rock wall (SIHP Site 9012), a World War II military encampment (SIHP Site 30109), and a complex of cairns marking the boundary between Lālāmilo and Waikōloa *ahupua'a* (SIHP Site 30110), were recorded within the project area.

This study was undertaken in accordance with Hawai'i Administrative Rules, and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in Hawai'i Administrative Rules 13§13–284. Compliance with the above standards is sufficient for meeting the initial historic preservation review process requirements of both the Department of Land and Natural Resources and the County of Hawai'i Planning Department. This report contains background information outlining the project area's physical and cultural contexts, a presentation of previous archaeological work in the vicinity of the project area, and current survey expectations based on that previous work. Also presented is an explanation of the project's methods, detailed descriptions of the archaeological features encountered, interpretation and evaluation of those resources, and treatment recommendations for the documented sites.

PROJECT AREA DESCRIPTION

The current project area consists of approximately 87.5 acres located at elevations ranging from roughly 354 to 427 meters (1,160 to 1,400 feet) above sea level in the *ahupua'a* of Lālāmilo and Waikōloa, South Kohala District, Island of Hawai'i (see Figure 1). The project area is situated on Mauna Kea (hm) lava flows that are 250 to 65 thousand years old (Wolfe and Morris 1996). Soils that have developed on these lava flows are classified as belonging to the Hapuna-Waikui-Lalamilo complex, which is typically comprised of 35 percent Hapuna and similar soils, 35 percent Waikui and similar soils, 20 percent Lalamilo and similar soils, and 10 percent minor components (USDA 2013). Mean annual rainfall within the project area ranges from 250 to 280 millimeters, with most of the rain falling during the wettest winter months of December and January, and very little rainfall occurring during the driest summer months of June, July, and August (Giambelluca et al. 2013). This area often experiences strong easterly/northeasterly trade winds that blow down the mountains at speeds of 20-30 miles per hour during the nighttime. Daytime sea breezes, which blow on-shore, are often of similar strength (Jurvik and Jurvik 1998). As a result of the arid conditions, strong winds, periodic wildfires, and nearly two centuries of use as cattle pasture, vegetation within the project area is relatively sparse. Introduced grasses, including buffelgrass (*Pennisetum ciliare*) and fountain grass (*Pennisetum setaceum*), along with various other introduced weeds, blanket most of the project area, but a few native species, including *'Uhaloa* (*Waltheria indica*), *'Akia* (*Wikstroemia pulcherrima*), and *Pā'ū o Hi'iaka* (*Jacquemontia ovalifolia*), were also observed. Trees are relatively scarce within the project area, but a few scattered *kiawe* (*Prosopis pallida*) are present, along with a single pine tree planted next to the former Lālāmilo Wind Farm parking lot.

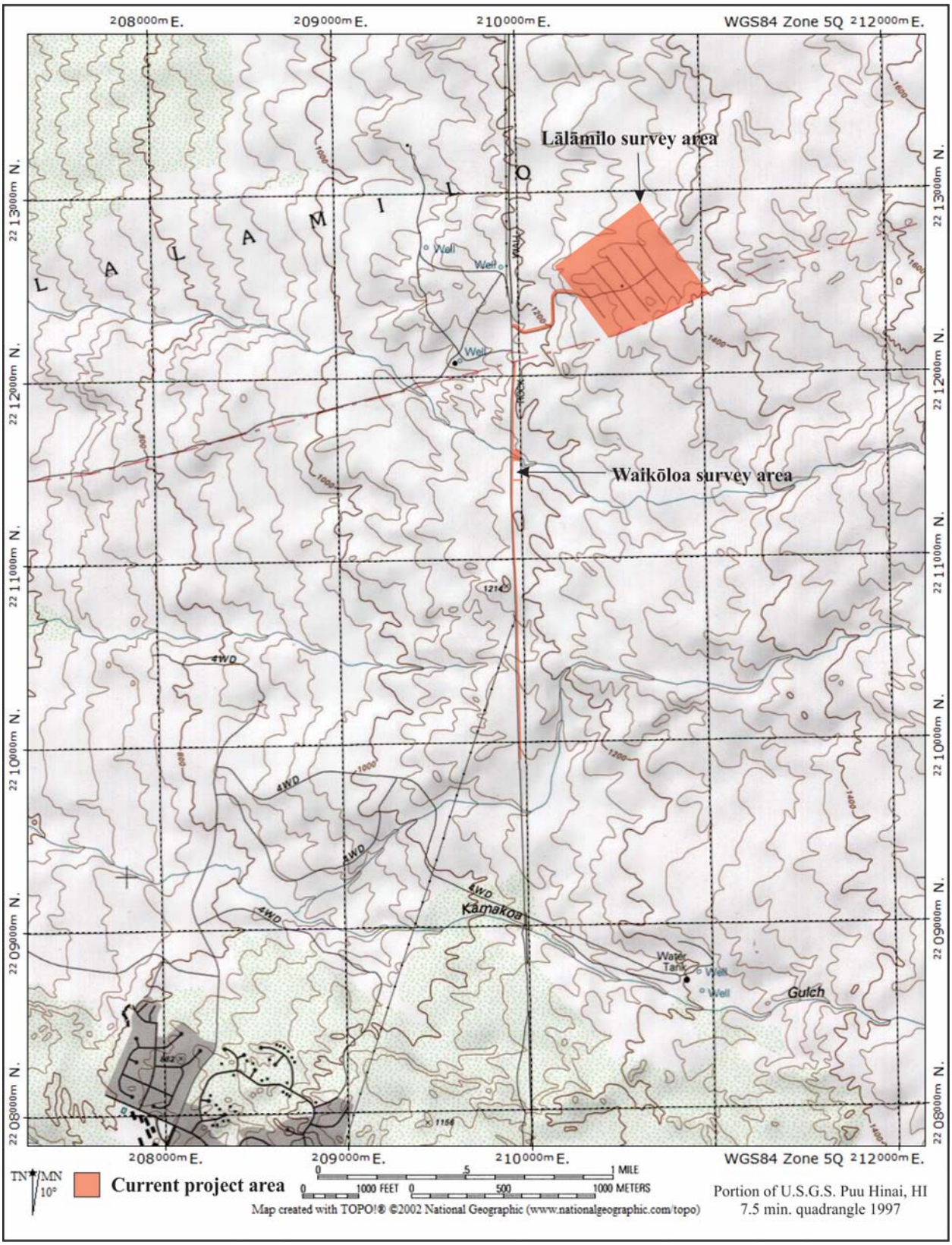

Figure 1. Project area location.

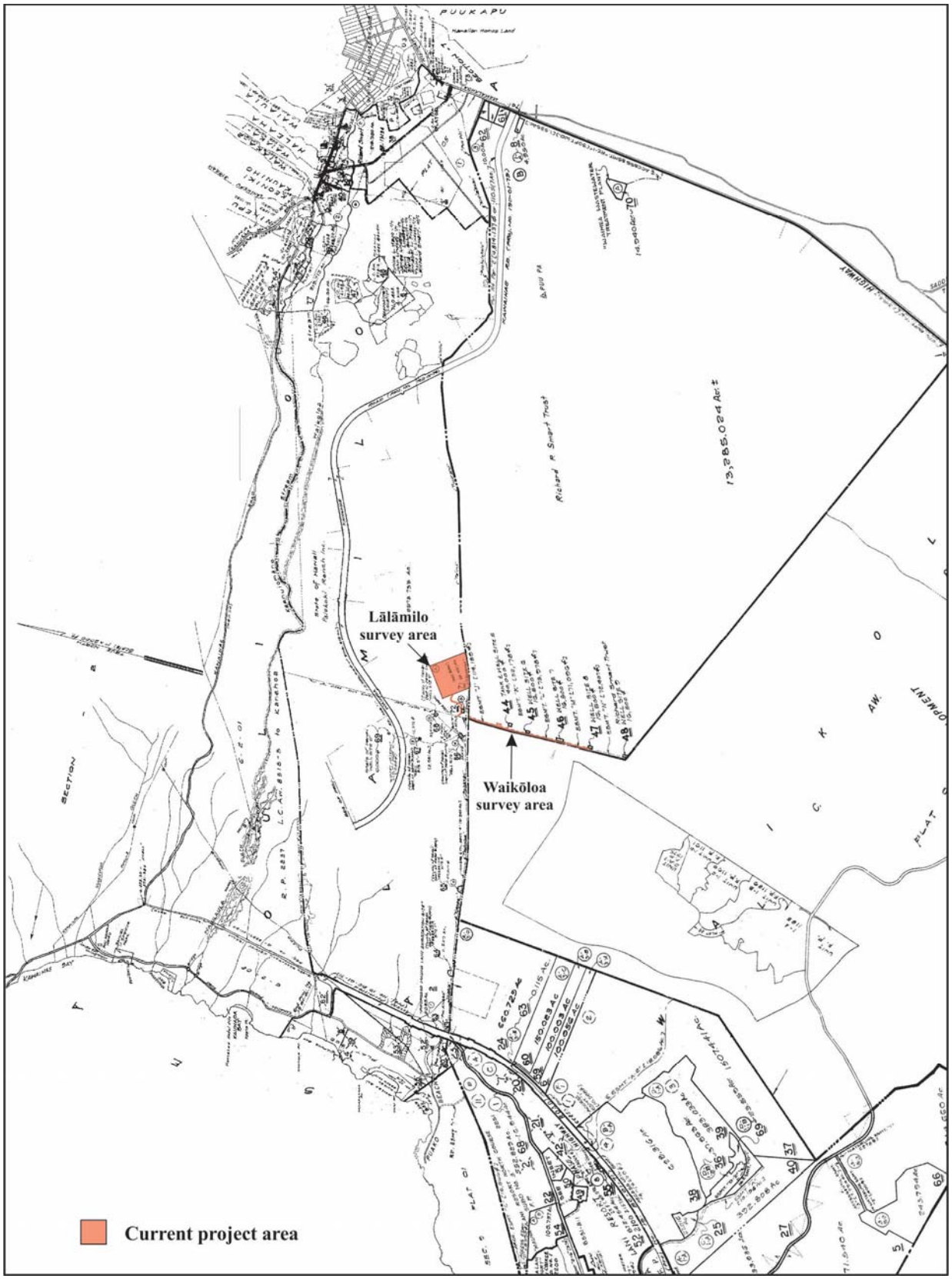

Figure 2. Portions of Tax Map Keys (TMKs): (3) 6-6-01 and 6-8-01 showing the location of the current project area.

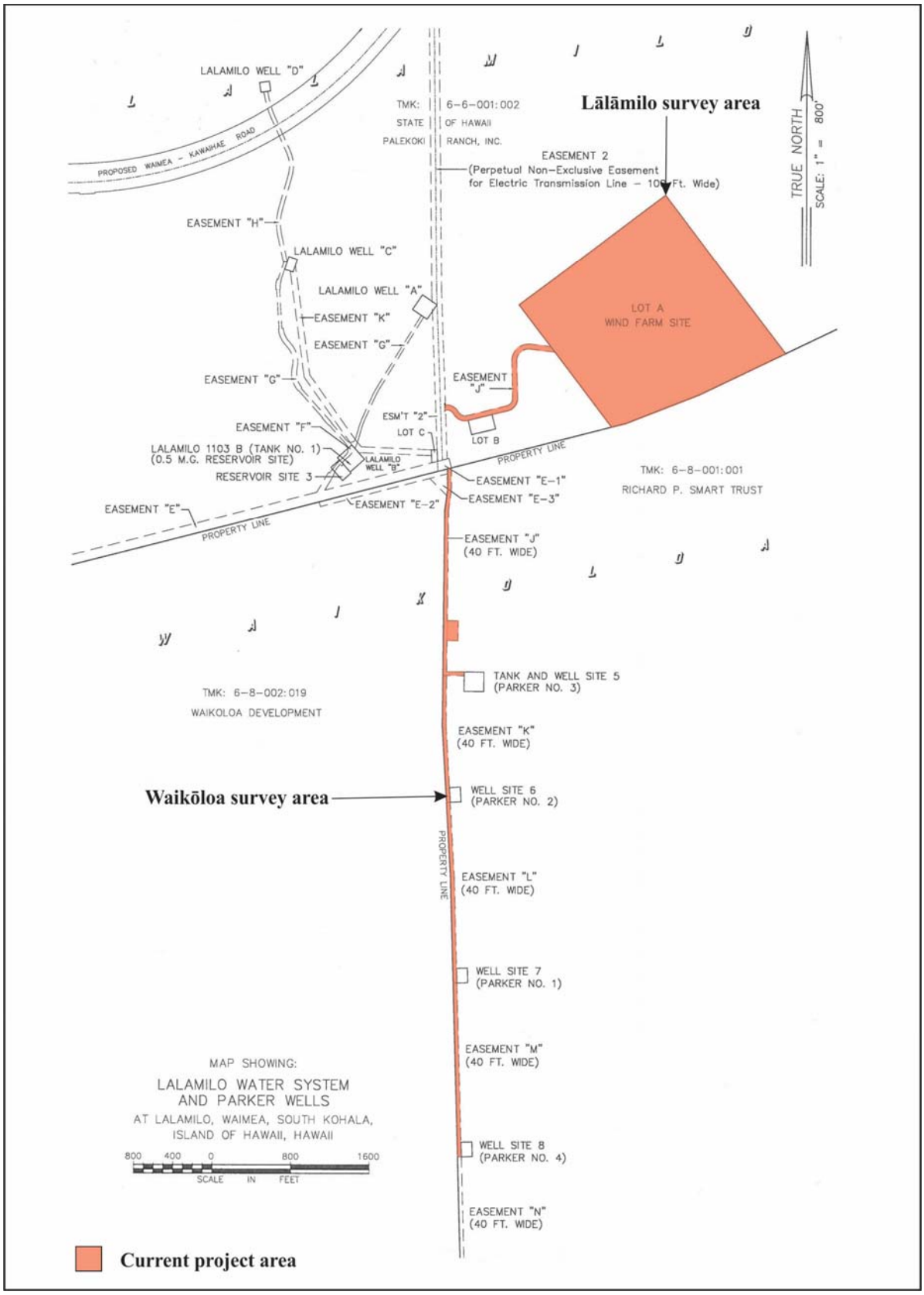

Figure 3. Map of the Lālāmilo Water System and Parker Wells (revised April 30, 2012) showing the current project area.

The project area includes two distinct archaeological survey areas; one within Lālāmilo Ahupua‘a (80 acres) for the construction of the wind farm and another within Waikōloa Ahupua‘a (7.5 acres) for the installation of new power lines to the existing Parker wells (see Figures 2 and 3). Development of the wind farm will occur on one parcel within the Lālamilo survey area, the 78.081-acre Lot A (TMK: (3) 6-6-01:071) and on a 1.947-acre easement (Easement J) across TMK: (3) 6-6-01:002 (por.). The installation of the power lines to Parker wells No. 1, 2, 3 and 4 will occur on four continuous, 40-foot wide easements (Easements J, K, L, and M) across TMK: (3) 6-8-01:001 (por.) within the Waikōloa survey area. Large portions of both the Lālāmilo and Waikōloa survey areas have been previously developed (Figure 4).

The Lālāmilo survey area, previously the location of the Lālāmilo Wind Farm and its associated infrastructure (from ca. 1985 to 2010), includes Lot A that is both accessed by a 20-foot wide roadway within the 1.947-acre Easement J (see Figure 3). This existing gravel/paved road extends (within the easement) for a total distance of roughly 495 meters. It follows a meandering course up a hill from a gate in a rock wall (SIHP Site 9012) at the western end of Easement J to the western boundary of Lot A (Figures 5 and 6). Along its route to Lot A the road crosses over a culvert within a small drainage (Figure 7), and passes above-ground electrical boxes (Figure 8) for an existing buried conduit within which the proposed collected line will be pulled. At the western boundary of Lot A the access road continues north for roughly 250 meters to the old wind farm’s office and maintenance (O & M) building, which has two adjacent towers, a parking area, a water catchment tank, and a more recently erected meteorological tower nearby (an older meteorological tower is located in the northern portion of Lot A).

In addition to the O & M building (Figure 9), the 78.081-acre Lot A formerly housed 120 Jacobs wind generators, aligned in five arrays. The wind turbines and towers (with the exception of two) have been removed from the property, but the locations of the five arrays are marked by five parallel swaths of bulldozed land (four of equal length, and one of shorter length; see Figure 4) that extend northwest/southeast across the lot (Figure 10). The four corners of the Lot A are each marked by a metal pipe stuck in concrete. A fence line, with old bulldozed roads along either side of it, that marks the boundary between Lālāmilo and Waikōloa *ahupua‘a*, extends along the roughly 587 meter long southern boundary of Lot A (Figure 11). The remaining boundaries, are not visually marked, but are straight lines projected between the corner pins. The five former wind turbine arrays occupied the southwestern portion of Lot A where the flattest terrain occurs (Figure 12). At the northwestern end of the four, equal length, bulldozed swaths a short northwest facing slope is present, and to the northeast of *mauka* most swath the land gradually becomes steeper and hillier. A prominent double ridge formation, with a natural drainage channel between, occurs in the western corner of Lot A at the northwestern end of the *makai* most bulldozed swath. This ridge is likely why that array was the shortest at the former Lālāmilo Wind Farm.

The Waikōloa survey area, where power lines will be installed to four existing wells (Parker wells No. 1, 2, 3, and 4), includes four contiguous, 40-foot wide, access easements (Easements J, K, L, and M) across TMK: (3) 6-8-01:001 that total 7.5 acres (see Figure 2). This survey area contains an existing 20-foot wide paved roadway that extends for 2.1 kilometers along the *mauka* (eastern) edge of a rock wall (SIHP Site 9012) from a gate at the northern end of Easement J (Figure 13) to the termination of the pavement at the southern end of Easement M (Figure 14). Easement J also includes a 55-meter long stub road at its southern end that access Parker well No. 3 (see Figure 3). Nearly the entire length of the Waikōloa survey area has been disturbed by bulldozing, including the space between the existing road and the wall (Figure 15), and the area along the eastern edge of the road to a distance of at least six meters (20 feet). At one location within Easement J, between the northern gate and Parker well No. 3, the road crosses a small drainage and skirts a small hill, veering away from the rock wall (Figure 16); the area between the wall and the road at this location is the only portion of the Waikōloa survey area that has not been disturbed by bulldozing.

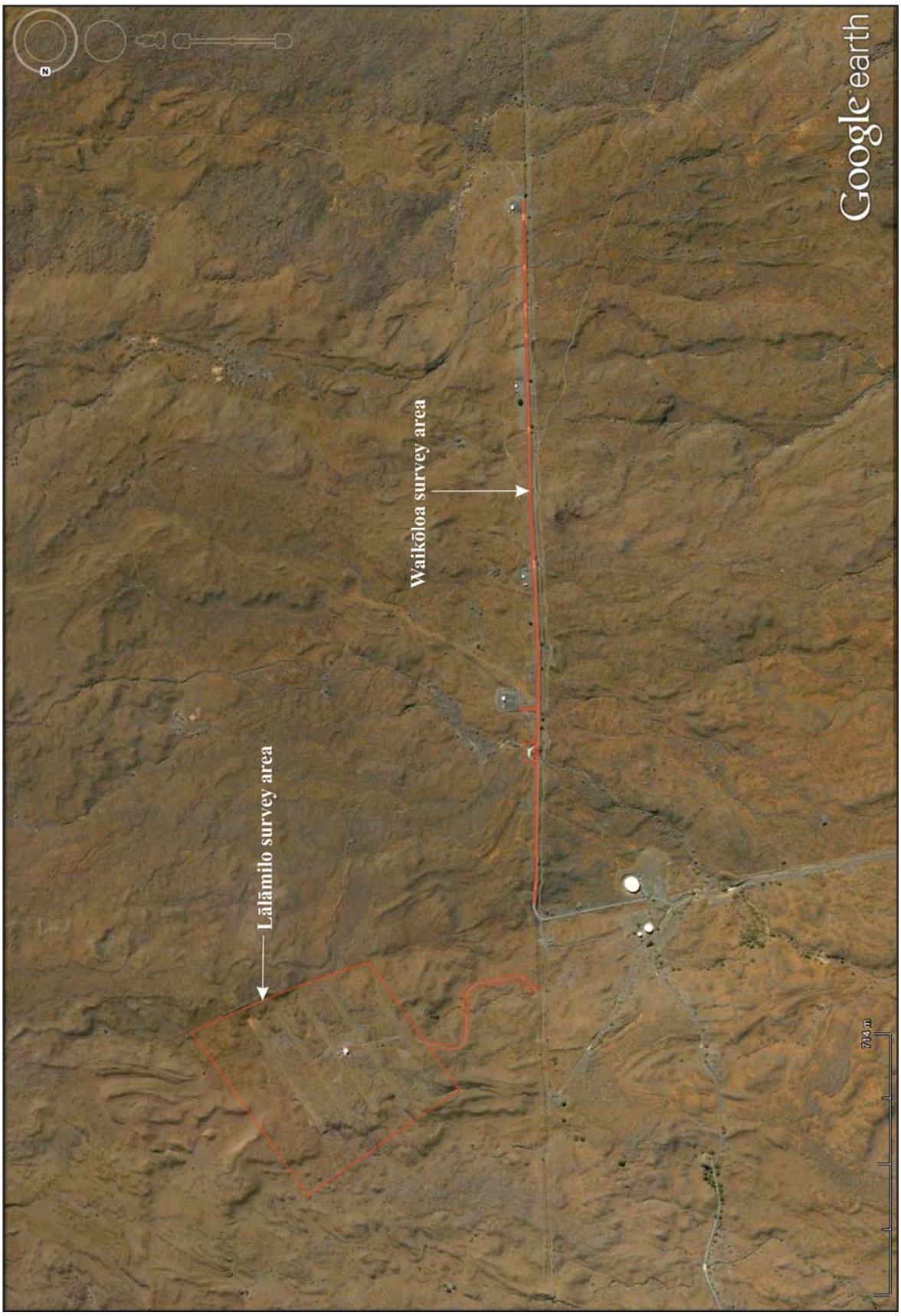

Figure 4. Current Google Satellite™ image showing the current project area outlined in red.

Figure 5. Lālāmilo survey area, gravel road and gate at the western end of Easement J, view to the northwest.

Figure 6. Lālāmilo survey area, paved road near the western boundary of Lot A, view to the southwest.

Figure 7. Lālāmilo survey area, culvert beneath the existing access road, view to the west.

Figure 8. Lālāmilo survey area, electrical along the southern edge of the existing road, view to the southwest.

Figure 9. Lālāmilo survey area, the old wind farm's office and maintenance building on Lot A, view to the northeast.

Figure 10. Lālāmilo survey area, bulldozed swath of land within Lot A that formerly housed an array of wind towers, view to the northwest.

Figure 11. Lālāmilo survey area, fence line along the southern boundary of Lot A, view to the southwest.

Figure 12. Lālāmilo survey area, southwestern portion of Lot A where the five arrays of wind turbines were formerly located, view to the northwest.

Figure 13. Waikōloa survey area, existing road at the western end of Easement J, view to the north.

Figure 14. Waikōloa survey area, termination of the paved road at the southern end of Easement M, view to the north.

Figure 15. Waikōloa survey area, existing paved road within Easement L, view to the north.

Figure 16. Waikōloa survey area, undisturbed portion of Easement J between the rock wall and the road, view to the south.

2. BACKGROUND

To generate a set of expectations regarding the nature of archaeological resources that might be encountered within the project area, and to establish an environment within which to access the significance of any such resources, a general cultural-historical background for the region and previous archaeological studies relative to the project area are presented.

CULTURE-HISTORICAL CONTEXT

The current project area is situated on the Island of Hawai'i within the District of South Kohala in the *ahupua'a* of Lālāmilo and Waikōloa (Figure 17). As described by Handy and Handy:

> The district of Kohala is the northernmost land area of the island of Hawaii. 'Upolu Point, the northwesterly projection, fronts boldly out into the Alanuihaha [sic] Channel towards the southeastern coast of Maui, and is the nearest point of communication between the two islands. To the south, along Hawaii's western coast, lies Kona; to the east the rough coast of Hamakua District unprotected from the northerly winds and sea. Kohala was the chiefdom of Kamehameha the Great, and from this feudal seat he gradually extended his power to embrace the whole of the island, eventually gaining suzerainty of all the Hawaiian Islands. (1991:528)

Comprehensive and detailed culture-historical (both archival and oral) background information relative to the general project area can be found in Barrera and Kelly (1974), Clark (1987), Clark and Kirch (1983), Jensen (1994), and Maly (1999). The prehistory of South Kohala is understood only in broad terms (Kirch 1985; Rosendahl and Carter 1988). In a general, Precontact population was centered both in the uplands and along the coast. Initial occupation of the area probably began at small coastal settlements at selected areas, where early inhabitants exploited the diverse marine resources (Jensen 1994). The upland habitation that followed focused on agricultural field systems, which undoubtedly provided much of the produce for the coastal inhabitants (Carlson and Rosendahl 1990). The earliest inhabitants emphasized the use of natural caves and overhangs, along with the construction of small, simple surface features for habitation purposes, but as populations increased and expanded, so did the occurrence of more permanent habitation structures in both the coastal and upland areas (Jensen 1994). A network of coastal and inland trails, over which the exchange of goods occurred, connected the coastal and upland population centers and resource areas (Hommon 1976). The current study area occupies a dry environmental zone intermediate between the coastal *kula* and the fertile agricultural uplands.

It is within this context that the following discussion of the history and culture of the study area is framed. The chronological summary presented below begins with the peopling of the Hawaiian Islands and includes the presentation of a generalized model of Hawaiian Prehistory containing specific legendary references to the study *ahupua'a* and a discussion of the general settlement patterns for South Kohala. The discussion of Prehistory is followed by a summary of Historic events in the district that begins with the arrival of foreigners in the islands and then continues with the history of land use in South Kohala after contact. The summary includes a discussion of the changing life ways and population decline of the early Historic Period, a review of land tenure in the study *ahupua'a* during the *Māhele 'Āina* of 1848, and documentation of the transition to the sugar and ranching industries during the last quarter of the nineteenth century and the first three-quarters of the twentieth century. A synthesis of the Precontact settlement patterns and the Historically documented land use, combined with a review of the findings of previously conducted archeological studies, provides a means for predicting the types of archaeological features that may be encountered within the project area, and a basis for assessing the function, age, and significance of any encountered archaeological sites.

A Generalized Model of Hawaiian Prehistory

The generalized cultural sequence that follows is based on Kirch's (1985) model, and amended to include recent revisions offered by Kirch (2011). The conventional wisdom has been that first inhabitants of Hawai'i Island probably arrived by at least A.D. 300, and focused habitation and subsistence activity on the windward side of the island (Burtchard 1995; Kirch 1985; Hommon 1986). However, there is no archaeological evidence for occupation of Hawai'i Island (or perhaps anywhere in Hawai'i) during this initial settlement, or colonization stage of island occupation (A.D. 300 to 600). More recently, Kirch (2011) has convincingly argued that Polynesians may not have arrived to the Hawaiian Islands until at least A.D. 1000, but expanded rapidly thereafter. The implications of this on the currently accepted chronology would alter the timing of the Settlement, Developmental, and Expansion Periods, possibly shifting the Settlement Period to A.D. 1000 to 1100, the Developmental Period to A.D. 1100 to 1350, and the Expansion Period to A.D. 1350 to 1650.

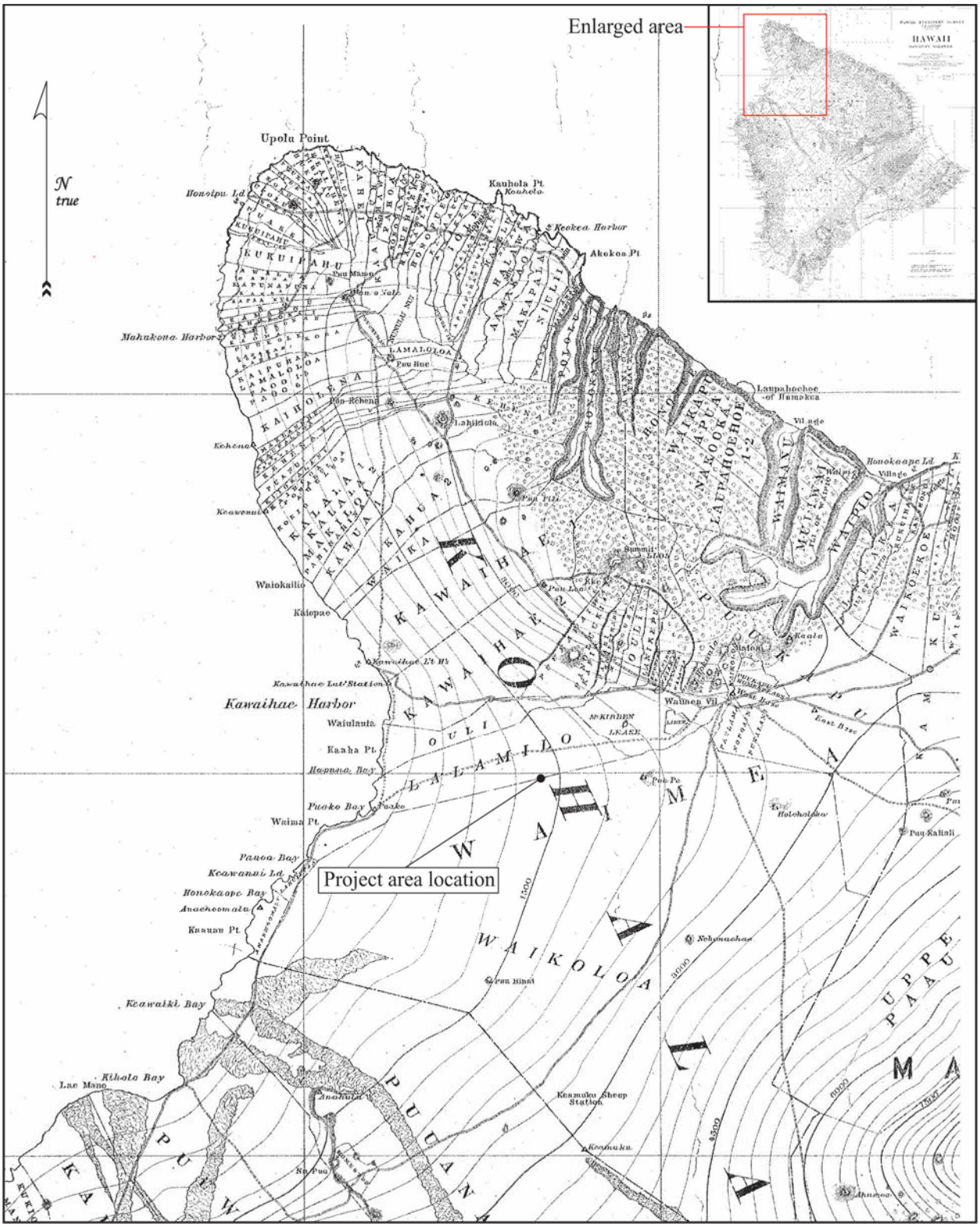

Figure 17. Portion of Hawai‘i Registered Map No. 2124 showing Lālāmilo and Waikōloa *ahupua‘a* (prepared by John M. Donn in 1901).

The initial settlement in Hawai‘i is believed to have occurred from the southern Marquesas Islands. This was a period of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order. Order was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the Hawaiians brought from their homeland certain universal Polynesian customs: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *‘aumakua* concept; various epiphenomenal beliefs; and the concept of *mana*.

In the District of Kohala, the long ridge of the Kohala Mountains extends perpendicular to the predominant northeasterly trade winds, creating an orographic rainfall pattern that separates the district into two distinct environmental zones; a wetter windward zone on the eastern (Hāmākua) side, and a drier leeward zone on the western (Kona) side. The first settlers of this district likely established a few small communities near sheltered bays with access to fresh water primarily in the windward valleys and gulches. The communities would have shared extended familial relations, and had an occupational focus on the collection of marine resources. Evidence for early occupation of leeward Kohala has been collected from Kapa‘anui, where Dunn and Rosendahl (1989) recovered radiocarbon samples that potentially date to as early as A.D. 461, and from ‘Anaeho‘omalu where Barrera (1971) reported A.D. 900 as the initial date for settlement. These early dates should be viewed with suspicion (see Kirch 2011), but it is possible that they represent the earliest establishment of small, short-term camps to exploit seasonal, coastal resources. Data recovered from Māhukona, along the leeward coast of North Kohala, suggest initial occupation taking place there by about A.D. 1280 (Burgett and Rosendahl 1993:36). Permanent settlement in Kohala has been reported as early as A.D. 1300 at Koai‘e, a coastal settlement, where subsistence primarily derived from marine resources, but was probably supplemented by small-scale agriculture as well (Tomonari-Tuggle 1988).

The Development Period (A.D. 1100 to 1350) brought about a uniquely Hawaiian culture. The portable artifacts found in archaeological sites of this period reflect not only an evolution of the traditional tools, but some distinctly Hawaiian inventions. The adze (*ko‘i*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. A few areas in Hawai‘i produced quality basalt for adze production. Mauna Kea, on the island of Hawai‘i, possessed a well-known adze quarry. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are ‘*ulu maika* stones and *lei niho palaoa*. The latter was a status item worn by those of high rank, indicating a trend toward greater status differentiation (Kirch 1985). As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of Hawai‘i were controlled by a few powerful chiefs.

The Expansion Period (A.D. 1350 to 1650) is characterized by the greatest social stratification, major socioeconomic changes, and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period. It was during the Expansion Period that a second major migration settled in Hawai‘i, this time from Tahiti in the Society Islands. According to Kamakau (1976), the *kahuna* Pā‘ao settled in the islands during the 13th century. Pā‘ao was the keeper of the god Kū‘kā‘ilimoku, who had fought bitterly with his older brother, the high priest Lonopele. After much tragedy on both sides, Pā‘ao was expelled from his homeland by Lonopele. He prepared for a long voyage, and set out across the ocean in search of a new land. On board Pā‘ao’s canoes were thirty-eight men (*kānaka*), two stewards (*kānaka ‘ā‘īpu‘upu‘u*), the chief Pilika‘aiea (Pili) and his wife Hina‘aukekele, Nāmau‘u o Malaia, the sister of Pā‘ao, and the prophet Makuaka‘ūmana (Kamakau 1991). In 1866, Kamakau told the following story of their arrival in Hawai‘i:

> Puna on Hawai‘i Island was the first land reached by Pā‘ao, and here in Puna he built his first *heiau* for his god Aha‘ula and named it Aha‘ula [Waha‘ula]. It was a *luakini*. From Puna, Pā‘ao went on to land in Kohala, at Pu‘uepa. He built a *heiau* there called Mo‘okini, a *luakini*.
>
> It is thought that Pā‘ao came to Hawai‘i in the time of the *ali‘i* La ‘au because Pili ruled as *mo‘i* after La‘au. You will see Pili there in the line of succession, the *mo‘o kū‘auhau*, of Hanala‘anui. It was said that Hawai‘i Island was without a chief, and so a chief was brought from Kahiki; this is according to chiefly genealogies. Hawai‘i Island had been without a chief for a long time, and the chiefs of Hawai‘i were *ali‘i maka‘āinana* or just commoners, *maka‘āinana*, during this time.
>
> . . . There were seventeen generations during which Hawai‘i Island was without chiefs—some eight hundred years. . . . The lack of a high chief was the reason for seeking a chief in Kahiki, and that is

> perhaps how Pili became the chief of Hawai‘i. He was a chief from Kahiki and became the ancestor of chiefs and people of Hawai‘i Island. (1991:100–102)

There are several versions of this story that are discussed by Beckwith (1970), including the version where Mo‘okini and Kaluawilinau, two *kāhuna* of Moikeha, decide to stay on at Kohala. The bones of the *kahuna* Pā‘ao are said to be deposited in a burial cave in Kohala in Pu‘uwepa [possibly Pu‘uepa?] (Kamakau 1964:41). The Pili line's initial ruling center was likely in Kohala too, but Cartwright (1933) suggests that Pili later resided in and ruled from Waipi‘o Valley in the Hāmākua District.

The period from A.D. 1300–1500 was characterized by population growth and expanded efforts to increase upland agriculture. Rosendahl (1972) has proposed that settlement at this time was related to seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites were occupied during the winter months, with a focus on agriculture. An increasing reliance on agricultural products may have caused a shift in social networks as well. Hommon (1976) argues that kinship links between coastal settlements disintegrated as those links within the *mauka-makai* settlements expanded to accommodate exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the *ahupua‘a* system. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas.

According to Kirch's (1985) model, the concept of the *ahupua‘a* was established sometime during the A.D. 1400s, adding another component to a then well-stratified society. This land unit became the equivalent of a local community, with its own social, economic, and political significance. *Ahupua‘a* were ruled by *ali‘i ‘ai ahupua‘a* or lesser chiefs; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land, which was managed by a *konohiki*. *Ahupua‘a* were usually wedge or pie-shaped, incorporating all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resource management planning. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003).

The name of an *ahupua‘a* sometimes indicates its importance, records its history, or reveals something about its resources or population. Waikōloa may have been named for a cold northwest wind that sometimes blows across the Hawaiian Islands (Pukui et al. 1974). There is slight discrepancy in the pronunciation of this *ahupua‘a* however, either Waikōloa or Waikoloa, which literally translates as "duck water". The name Lālāmilo literally translates as "*milo* tree branch" (Pukui et al. 1974). The Hawaiian language newspaper *Ka Hoku o Hawaii* contained the following traditional *mo‘olelo* of the naming of the *ahupua‘a* of the region in a two-part article published on July 5 and 19, 1917:

> The region of Lālāmilo was named for the chief Lālāmilo. Lālāmilo was the grandson of Kanakanaka, an expert *lawai‘a hī-‘ahi* (deep sea tuna lure fisherman) and Pili-a-mo‘o, a powerful priestess and ‘ōlohe. Kanakanaka and Piliamo‘o were the parents of Nē‘ula (a fishing goddess), and she married Pu‘u Hīnai a chief of the inlands. Nē‘ula and Pu‘u-hīnai were the parents of Lālāmilo. Kanakanaka's sister was the wind goddess, Waikōloa, for whom the lands are now named.
>
> Lālāmilo gained fame as an expert ‘ōlohe and fisherman. And through his wife Puakō, he came to possess the supernatural leho (cowry octopus lure) which had been an ‘ōnohi (cherished) possession of Ha‘aluea, a goddess with an octopus form... How this octopus lure came to rest on the reefs fronting this land remains a mystery . . .
>
> Puakō was the daughter of Wa‘awa‘a (kāne) and Anahulu (wahine), and the sister of: ‘Anaeho‘omalu (wahine); Pū‘āla'a (kane); and Maui-loa (kāne). Puakō's great desire was to eat he'e (octopus), and Pu‘āla'a was kept continually busy acquiring he‘e for Puakō, and getting pa‘ou‘ou fish for ‘Anaeho‘omalu. When he could no longer provide sufficient numbers of fish for his sisters they left Puna and set out in search of suitable husbands who could provide for their needs.
>
> Because of their great love for ‘Anaeho‘omalu and Puakō, Anahulu, Wa‘awa‘a, their relatives and attendants also moved to the Kona - Kohala region and dwelt at sites which now bear their names; only Pū‘āla‘a remained in Puna. This is how Pu‘u- Huluhulu, Pu‘u-Iki, and Mauiloa came to be named; and Pu‘u Anahulu (Ten day hill [ceremonial period]) was named for Anahulu, the chiefess wife of Wa‘awa‘a (Pu‘u Wa‘awa‘a).
>
> Arriving at Kapalaoa in the Kekaha lands of Kona, ‘Anaeho‘omalu married Nāipuakalaulani, son of the chiefess Kuaīwa of Kapalaoa. Puakō went on to Waimea where she met with natives of that area, and was introduced to the chiefess Nē‘ula, mother of Lālāmilo. When Nē‘ula learned that

> Puakō greatly coveted he‘e, she told Puakō that her son was the foremost lawai‘a ‘ōkilo he‘e (octopus fisherman) of the region. And because Puakō was so beautiful, Nē‘ula introduced her to Lālāmilo. Lālāmilo saw Puakō, and compared her to the foremost “he‘e” which he could catch. (translated in Maly and Maly 2002: 22-23)

Traditionally, Waikōloa and Lālāmilo were *‘ili* of the *kalana* (or ‘okana) of Waimea, a land division that in ancient times was treated as a sub-district, smaller than a district (*moku o loko*), but comprised of several other land divisions that contributed to its wealth (Maly and Maly 2002). The lands subject to the *kalana* of Waimea were those that form the southern limits of the present day South Kohala District including ‘Ōuli, Wai‘aka, Lālāmilo, Puakō, Kalāhuipua‘a, ‘Anaeho‘omalu, Kanakanaka, Ala‘ōhi‘a, Paulama, Pu‘ukalani, Pu‘ukapu, and Waikōloa (Figure 18). Bernice Judd, a former librarian at the Hawaiian Mission Children’s society, explains that:

> In the early days Waimea meant all the plateau between the Kohala Mountains and Mauna Kea, inland from Kawaihae. This area is from eight to ten miles long and from three to five miles wide. There was no running water on Mauna Kea, so the inhabitants lived at the base of the Kohala Mountains, where three streams touched the plain on their way towards the sea. . . (Judd 1832:14)

In some early accounts Waikōloa is referred to as Waikōloa Nui and Lālāmilo is referred to as Waikōloa Iki (Maly 1999). In other references Lālāmilo is referred to as Puakō, which today is the name of a small village on the coast within Lālāmilo. According to Dunn and Rosendahl (1992) land records of the mid-1800s reveal that Lālāmilo was actually the name of an ‘*ili* in Puakō, but Puakō either got absorbed into other *ahupua‘a* and the *‘ili* of Lalamilo became an *ahupua‘a*, or the names just got switched around on Historic maps. Unlike the map of Waimea prepared by S. C. Wiltse in June 1866 (see Figure 18), a 1901 map prepared by John M. Donn (see Figure 17) and a 1928 Hawaiian Government Survey map (Figure 19) both show the *ahupua‘a* of Waikōloa and Lālāmilo as they appear today.

The *ali‘i* and the *maka‘āinana* (commoners) were not confined to the boundaries of the *ahupua‘a*; when there was a perceived need, they also shared with their neighbor *ahupua‘a ohana* (Hono-ko-hau 1974). The *ahupua‘a* were further divided into smaller sections such as the *‘ili, mo‘o‘aina, pauku‘aina, kihapai, koele, hakuone*, and *kuakua* (Hommon 1986, Pogue 1978). The chiefs of these land units gave their allegiance to a territorial chief or *mo‘i* (king). *Heiau* building flourished during this period as religion became more complex and embedded in a sociopolitical climate of territorial competition. Monumental architecture, such as *heiau*, “played a key role as visual markers of chiefly dominance” (Kirch 1990:206). This pattern continued to intensify from A.D. 1500 to Contact (A.D. 1778), and it was the need to supply chiefs’ staying at Kawaihae with food that eventually lead to an expansion of upland agriculture in the Waimea area (Barrére 1983:27). Rechtman and Prasad (2006) suggest that the uplands of the region were exploited for forest resources possibly as early as the 13th and 14th centuries, followed by agriculture and prolonged residence in the 16th century. Kirch (1985) notes that dates attained by archaeological investigations demonstrate active, intensive use of the Waimea-Lālāmilo area for agriculture by the mid-17th century.

In the uplands of the Waimea-Lālāmilo area, at elevations ranging from roughly 750 and 900 meters (2,460 to 2,950 feet) above sea level, more fertile soil and increased rainfall allowed for the extensive cultivation of sweet potatoes and irrigated taro (Kirch 1985). Here, an agricultural complex with an extensive network of fields fed by a system of irrigation ditches running from the Waikoloa and Kahakohau Streams, dominated the landscape. Burtchard and Tomonari-Tuggle (2002) note that the Waimea-Lālāmilo field complex was also characterized by spatially limited residential sites, linear, low earthen ridges, and irrigation ditches located along (Waikoloa Stream) at the eastern margins of the system. Kirch surmises that the fields were perhaps intermittently irrigated, and that “simple furrows” were utilized to “direct water across the sloping field surfaces,” as “the capacity of the ditches was insufficient to have kept all fields constantly watered, and some method of rotation must have been practiced” (1985:231). In addition to sweet potatoes and taro, crops cultivated within the upland field system included *wauke*, *mamaki*, plantains, bananas, sugarcane, coconuts, and *hala* (Haun et al. 2003).

While most of the taro and sweet potato fields of South Kohala were located in the rainier uplands near the present day town of Waimea (where there was also a sizable permanent population), Handy and Handy relate that “the coastal section of Waimea, now called South Kohala, has a number of small bays with sandy shores where fishermen used to live, and where they probably cultivated potatoes in small patches . . . Puako near the Kona border was a sizable fishing village at one time where there were undoubtedly many sweet potato patches” (1991:532). The name of the village of Puakō, which literally translates as “sugarcane blossom” (Pukui et al. 1974), suggests that sugarcane was grown there. In fact, it was the A.D. 1880 discovery of wild sugarcane growing near the village of Puakō that would eventually lead to the establishment of the short-lived Puakō Sugar Plantation (Puakō Historical Society 2000).

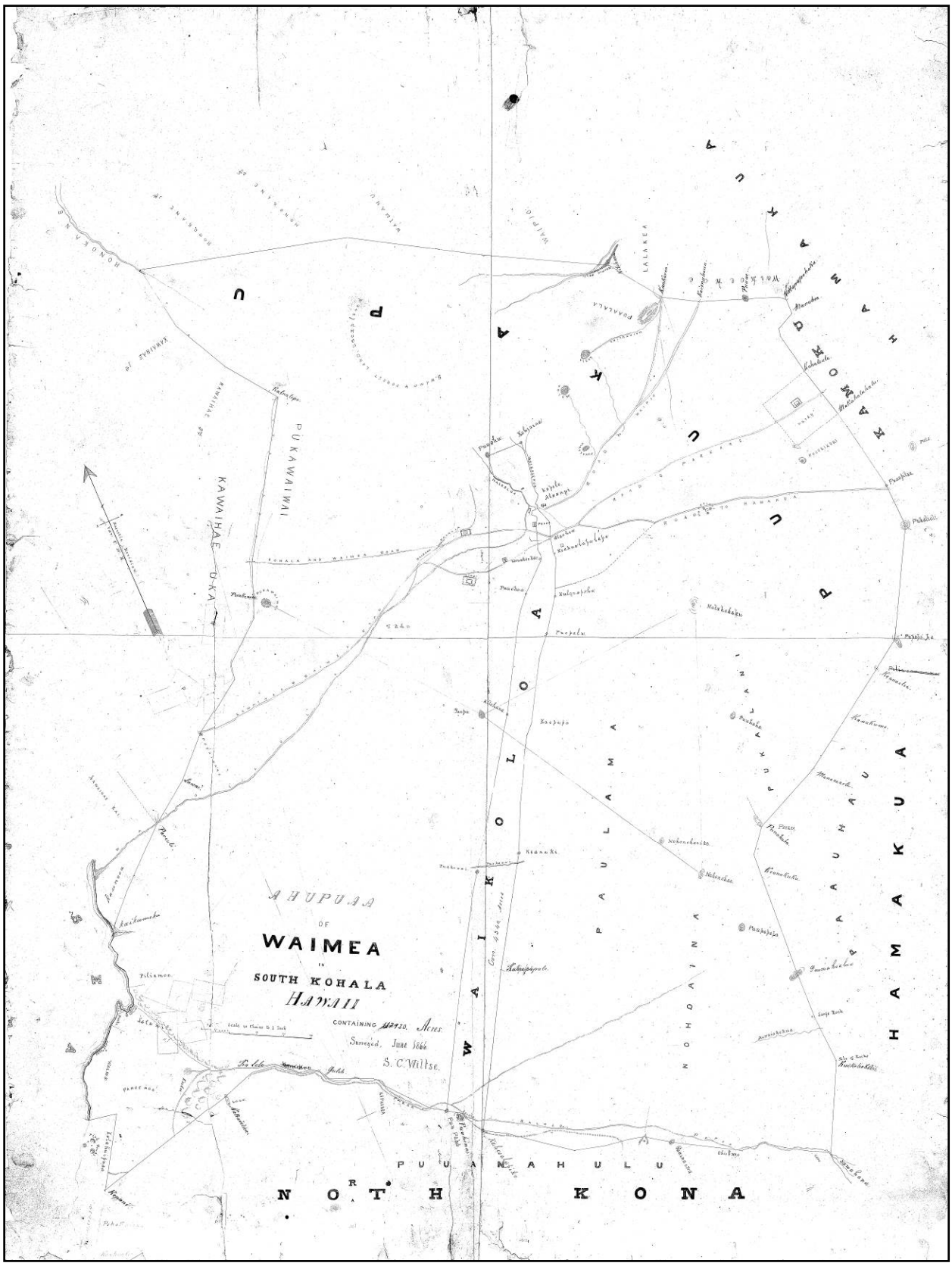

Figure 18. Hawai‘i Registered Map No.712 showing the *ahupua‘a* of Waimea, prepared by S. C. Wiltse, June 1866.

Figure 19. Registered Map No. 1080 showing *kalana* of Waimea (prepared by C.J. Lyons in 1885).

Sugarcane (*Saccharum officinarum*) was a Polynesian introduction that served a variety of important uses. The *kō kea,* or white cane, was the most common, and was usually planted near Hawaiian homes for medicinal purposes, and to counteract bad tastes (Handy and Handy 1991:185). Sugarcane was a snack, condiment, famine food; fed to nursing babies, and helped to strengthen children's teeth by chewing on it (Handy and Handy 1991:187). It was used to thatch houses when *pili* grass (*Heteropogon contortus*) or *lau hala* (*Pandanus odortissimus*) were not abundant (Malo 1903).

Pukui (1983) cites a proverb that reference Kohala. She provides an explanation and notes that Hawaiian proverbs have layers of meaning that are best left to the imagination of the reader:

> *I 'ike 'ia no o Kohala i ka pae kō, a o ka pae kō ia kole ai ka waha.*
> One can recognize Kohala by her rows of sugar cane which can make the mouth raw when chewed.

Pukui interprets this proverb as follows:

> When one wanted to fight a Kohala warrior, he would have to be a very good warrior to succeed. Kohala men were vigorous, brave, and strong. (1983:127)

By the seventeenth century, large areas of Hawai'i Island (*moku āina* – districts) were controlled by a few powerful *ali'i 'ai moku*. There is island-wide evidence to suggest that growing conflicts between independent chiefdoms were resolved through warfare, culminating in a unified political structure at the district level. It has been suggested that the unification of the island resulted in a partial abandonment of portions of leeward Hawai'i, with people moving to more favorable agricultural areas (Barrera 1971; Schilt and Sinoto 1980). 'Umi a Līloa, a renowned *ali'i* of the Pili line who ruled from Waipi'o Valley, is often credited with uniting the island of Hawai'i under one rule (Cordy 1994). According to Kamakau (1992) 'Umi was skilled fisherman, and fishing for *aku*, his favorite fish, often brought him to the beaches of South Kohala from Kalahuipua'a to Makaula, where he also fished for *'ahi* and *kala* with many other famed fishermen and all the chiefs of the kingdom. 'Umi's reign lasted until around ca. A.D. 1620, and was followed by the rule of his son, Keawenui a 'Umi, and then his grandson, Lonoikamakahiki (Cordy 1994).

Kirch (1985) places the beginning of the Proto-Historic Period (A.D. 1650–1795) during the rule of Lonoikamakahiki. This was a time marked by both political intensification and stress an continual conquest by the reigning *ali'i*. Wars occurred regularly between intra-island and inter-island polities during this period, and included battles that transpired in the vicinity of the current project area. One such battle was fought between Lonoikamakahiki (Lono) and his older brother, Kanaloakua'ana, who rebelled against him. According to Fornander, Kanaloakua'ana and his rebel forces were situated at:

> . . . the land called Anaehoomalu, near the boundaries of Kohala and Kona. The rebel chiefs were encamped seaward of this along the shore. The next day Lono marched down and met the rebels at the place called Wailea, not far from Wainanalii, where in those days a watercourse appears to have been flowing. Lono won the battle, and the rebel chiefs fled northward with their forces. At Kaunooa [Kauna'oa], between Puako and Kawaihae, they made another stand, but were again routed by Lono, and retreated to Nakikiaianihau, where they fell in with reinforcements from Kohala and Hamakua. Two other engagements were fought at Puupa [on the plain north of Waikōloa] and Puukohala, near the Heiau of that name, in both of which Lono was victorious. . . (Fornander 1996:120-121)

Later, Lonoikamakahiki battled the forces of Maui led by Kamālālawalu (Kama) on the plain of Waikōloa below Pu'u 'Ōā'oaka (Maly and Maly 2002). According to Kamakau:

> After Kama-Iala-walu's warriors reached the grassy plain, they looked seaward on the left and beheld the men of Kona advancing toward them. The lava bed of Kaniku and all the land up to Hu'ehu'e was covered with the men of Kona. Those of Ka'u and Puna were coming down from Mauna Kea, and those of Waimea and Kohala were on the level plain of Waimea [Waikōloa]. The men covered the whole of the grassy plain of Waimea like locusts. Kamalalawalu with his warriors dared to fight. The battlefield of Pu'oa'oaka was outside of the grassy plain of Waimea, but the men of Hawaii were afraid of being taken captive by Kama, so they led [Kamalalawalu's forces] to the waterless plain lest Maui's warriors find water and hard, waterworn pebbles. The men of Hawaii feared that the Maui warriors would find water to drink and become stronger for the slinging of stones that would fall like raindrops from the sky. The stones would fall about with a force like lightning, breaking the bones into pieces and causing sudden death as if by bullets . . .
>
> . . . The Maui men who were used to slinging shiny, water-worn stones grabbed up the stones of Pu'oa'oaka. A cloud of dust rose to the sky and twisted about like smoke, but the lava rocks were light, and few of the Hawaii men were killed by them. This was one of the things that helped to

> destroy the warriors of Kama-lala-walu: They went away out on the plain where the strong fighters were unable to find water . . . The warriors of Maui were put to flight, and the retreat to Kawaihae was long. [Yet] there were many who did reach Kawaihae, but because of the lack of canoes, only a few escaped with their lives ... Kamalalawalu, ruler of Maui, was killed on the grassy plain of Puako, and some of his chiefs were also destroyed. (1991:58-60)

By the 1700s, the rule of Hawai‘i Island was divided amongst the chiefs of Kona and Hilo (Kamakau 1992). Keawe, a Pili line ruler and the son of Kanaloakapulehu, was the chief of Kohala, Kona, and Ka‘ū. When Keawe died, he split the rule of his lands between two of his sons, further dividing the island’s chiefdoms; Kalaninui‘iamamao became the ruling chief of Ka‘ū, and Ke‘eaumoku became the ruling chief of Kona and Kohala (Kamakau 1992). Wars between the *ali‘i* continued unabated through this transition.

After Keawe’s death, Alapa‘inui, the son of former Kona war chief Kauauanui a Mahi, desired to take control of Hawai‘i Island (Kamakau 1992). Alapa‘inui, who had been living on Maui since the death of his father, returned to Hawai‘i and waged war against the chiefs of Kona and Kohala. Alapa‘inui was eventually victorious and he took the chiefs of those districts captive, proclaiming Kona and Kohala his own. Kekaulike, the ruler of Maui, much preferred the former chiefs of Hawai‘i Island, and wished to help them reclaim their lands. The Maui forces attacked Alapa‘inui, but were unable to defeat him. Although Alapa‘inui’s forces were never beaten, the frequent attacks by Kekaulike did prevent him from taking the chiefs of Hilo and Ka‘ū captive (Alapa‘inui did eventually gain control of these districts however). Alapa‘inui later fought and defeated the forces of O‘ahu on Moloka‘i, and after Kekaulike’s death he fought Kauhi (his rival’s oldest son) on Maui, where he was also victorious. Alapa‘inui ruled for many years, but at the end of his reign, after moving to Kikiako‘i in Kawaihae, he became seriously ill. It was there at the *heiau* of Mailekini that he appointed his son Keawe‘ōpala ruler of the island (Kamakau 1992).

During this time of warfare, and following the death of Keawe, Kamehameha was born in the North Kohala District in the *ahupua‘a* of Kokoiki, near the *heiau* of Mo‘okini (Kamakau 1992). There is some controversy about the year of his birth, but Kamakau (1992:66–68) places the birth event sometime between A.D. 1736 and 1758, most likely nearer to the later date. The birth event is said to have occurred on a stormy night of rain, thunder, and lightning, signified the night before by a very bright, ominous star, thought by some to be Halley’s comet (this is also controversial). Kamehameha’s ancestral homeland was in Hālawa, North Kohala (Williams 1919).

It was in 1754 that Keawe‘ōpala became the ruler of Hawai‘i, but many of the chiefs who were deprived of their lands battled against him. Keawe‘ōpala was soon defeated in South Kona by Kalani‘ōpu‘u, who then became the ruler of Hawai‘i Island (Kamakau 1992). Kalani’ōpu‘u was a clever and able chief, and a famous athlete in all games of strength, but according to Kamakau (1992), he possessed one great fault: he loved war and had no regard for others’ land rights. Although challenged by many rivals, Kalani‘ōpu‘u maintained his rule over Hawai‘i Island for nearly thirty years.

About A.D. 1759, Kalani‘ōpu‘u conquered East Maui and defeated his wife’s brother, the Maui king Kamehamehanui, by using Hāna’s prominent Pu‘u Kau‘iki as his fortress. He appointed one of his Hawai‘i chiefs, Puna, as governor of Hāna and Kīpahulu. Following this victory, Ke‘eaumoku, the son of Keawepoepoe who had originally supported Kalani‘ōpu‘u against Keawe‘ōpala, rebelled against the Hawai‘i chief. He set up a fort on a hill between Pololū and Honokāne Valleys in windward North Kohala, but Kalani‘ōpu‘u attacked him there and was victorious. Using ropes, Ke‘eaumoku escaped to the sea and fled in a canoe to Maui where he lived under the protection of the Maui chiefs (Kamakau 1992).

In A.D. 1766 Kamehamehanui, the king of Maui, died following an illness and Kahekili became the new ruler of that island. Ke‘eaumoku took Kamehamehanui’s widow, Namahana, a cousin of Kamehameha I, as his wife, and their daughter, Ka‘ahumanu, the future favorite wife of Kamehameha I, was born in a cave at the base of Pu‘u Kau‘iki, Hāna, Maui in A.D. 1768 (Kamakau 1992). In A.D. 1775 Kalani‘ōpu‘u and his Hāna forces raided and destroyed the neighboring district of Kaupō in Maui, and then launched several more raids on Moloka‘i, Lāna‘i, Kaho‘olawe, and parts of West Maui. It was at the battle of Kalaeoka‘ilio that Kamehameha, a favorite of Kalani‘ōpu‘u, was first recognized as a great warrior and given the name of Pai‘ea (hard-shelled crab) by the Maui chiefs and warriors (Kamakau 1992). During the battles between Kalani‘ōpu‘u and Kahekili (1777–1779), Ka‘ahumanu and her parents left Maui to live on the island of Hawai‘i (Kamakau 1992). Kalani‘ōpu‘u was fighting on Maui when the British explorer Captain James Cook first arrived in the islands.

History After Contact

The arrival of Western explorers in Hawai‘i signified the end of the Precontact Period, and the beginning of the Historic Period. With the arrival of foreigners, Hawai‘i’s culture and economy underwent drastic changes. Demographic trends during the late Proto-Historic Period/early Historic Period indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. At first there was a continued trend toward craft and status specialization, intensification of agriculture, *ali‘i* controlled aquaculture, the establishment of upland residential sites, and the enhancement of traditional oral history (Kirch 1985; Kent 1983). The Kū cult, *luakini heiau*, and the *kapu* system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kirch 1985; Kent 1983). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha I had conquered O‘ahu, Maui and Moloka‘i, in 1795, Hawai‘i saw the beginnings of a market system economy (Kent 1983). Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845). Later, as the Historic Period progressed, Kamehameha I died, the *kapu* system was abolished, Christianity established a firm foothold in the islands, and introduced diseases and global economic forces began to have a devastating impact on traditional life-ways in the Hawaiian Islands. This marked the end of the Proto-Historic Period and the end of an era of uniquely Hawaiian culture.

The Arrival of Captain James Cook and the End of Kalani‘ōpu‘u’s Reign (1778-1782)

British explorer Captain James Cook, in command of the ships *H.M.S. Resolution* and *H.M.S. Discovery*, landed in the Hawaiian Islands on January 18, 1778. The following January 17th [1779], on a return trip to Hawaiian waters, Cook anchored near Ka‘awaloa along the north shore of Kealakekua Bay in the South Kona District to resupply his ships. This return trip occurred at the time of the annual *Makahiki* festival, and many of chiefs and commoners were gathered around the bay celebrating. According to John Ledyard, a British marine on board Cook’s ship, upward of 15,000 inhabitants were present at the bay, and as many as 3,000 canoes came out to greet the ships (Jarves 1847:59). It has been suggested that Captain Cook was mistaken for the god Lono himself returned, as men would not normally be allowed to paddle out during the *Makahiki* without breaking the *kapu* and forfeiting all of their possessions (Kamakau 1992).

On January 24th, Kalani‘ōpu‘u, the reigning chief of Hawai‘i Island, left his battle with Kahekili on Maui, and arrived at Kealakekua Bay. He landed at ‘Awili in Ka‘awaloa, where he stayed at the home of the chief Keaweaheulu in Hanamua (Kamakau 1992). Upon arriving at the village, Kalani‘ōpu‘u immediately forbade others from approaching Cook’s ships, but on January 26th he visited Cook on board the *H.M.S. Resolution*, where they exchanged gifts. Kamehameha, the future ruler of all of Hawai‘i, was present at this meeting (Jarves 1847).

On February 4th, Cook set sail from Kealakekua Bay, but a storm off the Kohala coast damaged the mast of the *H.M.S. Resolution*, and both ships were forced to return to Kealakekua Bay to make repairs. With Cook’s return many of the inhabitants of Kealakekua began to doubt that he was actually the physical manifestation of Lono (Kamakau 1992). On February 13th, several natives were discovered stealing nails from the British ships. They were fired upon by the crew, and a chief close to Kalani‘ōpu‘u named Palea was knocked down, and his canoe taken. That night one of Cook’s boats was stolen, and the following morning Cook set ashore at Ka‘awaloa with six marines to ask Kalani‘ōpu‘u for its return. Kalani‘ōpu‘u, however, denied any knowledge of the theft; Cook decided to hold the chief captive until the boat was returned (Kamakau 1992). When Cook tried to seize Kalani‘ōpu‘u, however, a scuffle ensued and Cook was killed (along with four of his men and several natives) there on the shores of Ka‘awaloa, struck down by a metal dagger.

After Captain Cook fell, the British ships fired cannons into the crowd at the shore and several more natives were killed. Kalani‘ōpu‘u and his retinue retreated inland, bringing the body of Cook with them. Kamakau writes:

> . . . The bodies of Captain Cook and the four men who died with him were carried to Ka-lani-‘opu‘u at Maaunaloia, and the chief sorrowed over the death of the captain. He dedicated the body of Captain Cook, that is, he offered it as a sacrifice to the god with a prayer to grant life to the chief (himself) and to his dominion. Then they stripped the flesh from the bones of Lono. The palms of the hands and the intestines were kept; the remains (*pela*) were consumed with fire. The bones Ka-lani-‘opu‘u was kind enough to give to the strangers on board the ship, but some were saved by the kahunas and worshiped. (1992:103)

After the death of Captain Cook and the departure of *H.M.S. Resolution* and *Discovery*, Kalani‘ōpu‘u moved to Kona, where he surfed and amused himself with the pleasures of dance (Kamakau 1992). While he was living in Kona,

famine struck the district. Kalani‘ōpu‘u ordered that all the cultivated products of that district be seized, and then he set out on a circuit of the island. Kalani‘ōpu‘u first went to Hinakahua in Kapa‘au, North Kohala where he amused himself with “sports and games such as hula dancing, *kilu* spinning, *maika* rolling, and sliding sticks” (Kamakau 1992:106). During his stay in Kohala, Kalani‘ōpu‘u proclaimed that his son Kiwala‘ō would be his successor, and he gave the guardianship of the war god Kūka‘ilimoku to Kamehameha. However, Kamehameha and a few other chiefs were concerned about their land claims, which Kiwala‘ō did not seem to honor (Fornander 1996; Kamakau 1992). The *heiau* of Moa‘ula was erected in Waipi‘o at this time (ca. A.D. 1781), and after its dedication Kalani‘ōpu‘u set out for Hilo to quell a rebellion by a Puna chief named Imakakolo‘a.

Imakakolo‘a was defeated in Puna by Kalani‘ōpu‘u’s superior forces, but he managed to avoid capture and hide from detection for the better part of a year. While the rebel chief was sought, Kalani‘ōpu‘u “went to Ka-‘u and stayed first at Punalu‘u, then at Waiohinu, then at Kama‘oa in the southern part of Ka-‘u, and erected a heiau called Pakini, or Halauwailua, near Kama‘oa” (Kamakau 1992:108). Imakakolo‘a was eventually captured and brought to the *heiau*, where Kiwala‘ō was to sacrifice him. “The routine of the sacrifice required that the presiding chief should first offer up the pigs prepared for the occasion, then bananas, fruit, and lastly the captive chief” (Fornander 1996:202). However, before Kiwala‘ō could finish the first offerings, Kamehameha, “grasped the body of Imakakolo‘a and offered it up to the god, and the freeing of the tabu for the *heiau* was completed” (Kamakau 1992:109). Upon observing this single act of insubordination, many of the chiefs believed that Kamehameha would eventually rule over all of Hawai‘i. After usurping Kiwalao’s authority with a sacrificial ritual in Ka‘ū, Kamehameha retreated to his home district of Kohala. While in Kohala, Kamehameha farmed the land, growing taro and sweet potatoes (Handy and Handy 1972). Kalani‘ōpu‘u died in April of 1782 and was succeeded by his son Kiwala‘ō.

The Rule of Kamehameha I (1782-1819)

After Kalani‘ōpu‘u died, several chiefs were unhappy with Kiwala‘ō’s division of the island’s lands, and civil war broke out. Kiwala‘ō, Kalani‘ōpu‘u’s son and appointed heir, was killed at the battle of Moku‘ōhai, South Kona in July of 1782. Supporters of Kiwala‘ō, including his half-brother Keōua and his uncle Keawemauhili, escaped the battle of Moku‘ōhai with their lives and laid claim to the Hilo, Puna, and Ka‘ū Districts. According to ‘I‘i (1963), nearly ten years of continuous warfare followed the death of Kiwala‘ō, as Kamehameha endeavored to unite the island of Hawai‘i under one rule and conquer the islands of Maui and O‘ahu. Keōua became Kamehameha’s main rival on the island of Hawai‘i, and he proved difficult to defeat (Kamakau 1992). Keawemauhili would eventually give his support to Kamehameha, but Keōua never stopped resisting. Around 1790, in an effort to secure his rule, Kamehameha began building the *heiau* of Pu‘ukoholā at Kawaihae, which he dedicated to the war god Kūka‘ilimoku (Fornander 1996).

When the construction of Pu‘ukoholā Heiau was complete in the summer of 1791, Kamehameha sent two of his counselors, Keaweaheulu and Kamanawa, to Keōua to offer peace. Keōua was enticed to the dedication of the Pu‘ukoholā Heiau by this ruse, but when he arrived at Kawaihae he and his party were sacrificed to complete the dedication (Kamakau 1992). The assassination of Keōua gave Kamehameha undisputed control of Hawai‘i Island by about the year 1792 (Greene 1993). Between 1792 and 1796 Kamehameha mostly resided at Kawaihae and worked the lands of the Lālāmilo-Waikōloa-Waimea region (Maly and Maly 2002). By 1796, Kamehameha had conquered all the island kingdoms except for Kaua‘i. It wasn’t until 1810, when Kaumuali‘i of Kaua‘i gave his allegiance to Kamehameha, that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976).

In the twelve years following the death of Captain Cook, sixteen foreign ships (all British and American) called in Hawaiian waters (Restarick 1927). In 1790, two sister ships, the *Eleanora* and the *Fair American*, were trading in Hawaiian waters when a skiff was stolen from the *Eleanora* and one of its sailors was murdered. The crew of the *Eleanora* proceeded to slaughter more than 100 natives at Olowalu [Maui]. After leaving Maui, the *Eleanora* sailed to Hawai‘i Island, where one of its crew, John Young, went ashore and was detained by Kamehameha’s men. The other vessel, the *Fair American,* was captured by the forces of Kamehameha off the coast of North Kona, and in an act of retribution for the Olowalu massacre, they slaughtered all but one crew member, Isaac Davis. Guns and a cannon (later named “Lopaka”) were recovered from the Fair American, and were kept by Kamehameha as part of his fleet (Kamakau 1992). Kamehameha made John Young and Isaac Davis his advisors.

In 1792, Captain George Vancouver, who had sailed with Cook during his 1778-1779 voyages, arrived at Kealakekua Bay with a small fleet of British ships, where he met with Kamehameha. Vancouver stayed only a few days on this first visit, but returned again in 1793 and 1794 to take on supplies. Vancouver introduced cattle to the Island of Hawai‘i during his 1793 and 1794 visits, giving them as gifts to Kamehameha I, who immediately made the cattle *kapu*, thus preventing them from being killed (Kamakau 1992). Five cows, one bull, two ewes, and a ram brought to the island by Vancouver in 1793 were set free to roam in the saddle area of Waimea between Mauna Kea, Mauna Loa, and Hualālai (Escott 2008).

During one of his visits Vancouver anchored at Kawaihae and a member of his crew, Archibald Menzies, a surgeon and naturalist, trekked inland towards Waimea. Menzies' journal records the journey and describes the land in the vicinity of the current project area:

> I travelled a few miles back…through the most barren, scorching country I have ever walked over, composed of scorious dregs and black porous rock, interspersed with dreary caverns and deep ravines…The herbs and grasses which the soil produced in the rainy seasons were now mostly in the shriveled state, thinly scattered and by no means sufficient to cover the surface from the sun's powerful heat, so that I met with few plants in flower in this excursion. (Menzies 1920:55)

Around the turn of the century, Kamehameha gave Waikōloa Nui Ahupuaʻa (excluding the coastal *ʻili* of ʻAnaehoʻomalu and Kalāhuipuaʻa) to Isaac Davis (Rosendahl 2000). Although the land gifted to Davis encompassed a large area, it lacked extensive resources, and was primarily a place for catching birds and gathering *pili* grass. When Davis died in 1810 without naming an heir, John Young took control of the land to protect it for Davis' children, who were at that time too young to take on the responsibility (Rosendahl 2000). Lālāmilo, or Waikōloa Iki, with its fertile upland agricultural complex, remained under the control of Kamehameha.

During the first part of the nineteenth century, Hawaiʻi's culture and economy continued to change drastically as capitalism and industry established a firm foothold in the islands. The sandalwood (*Santalum ellipticum*) trade, established by Euro-Americans in 1790 and turned into a viable commercial enterprise by 1805 (Oliver 1961), was flourishing by 1810. This added to the breakdown of the traditional subsistence system, as farmers and fishermen were ordered to spend most of their time logging, resulting in food shortages and famine. Kamehameha, who resided on the Island of Oʻahu at this time, did manage to maintain some control over the trade of sandalwood on Hawaiʻi Island (Kuykendall and Day 1976; Kent 1983).

Upon returning to Kailua in 1812, Kamehameha ordered men into the mountains of Kona to cut sandalwood and carry it to the coast, paying them in cloth, *tapa* material, food and fish (Kamakau 1992). This new burden added to the breakdown of the traditional subsistence system. Kamakau indicates that, "this rush of labor to the mountains brought about a scarcity of cultivated food . . . The people were forced to eat herbs and tree ferns, thus the famine [was] called Hi-laulele, Haha-pilau, Laulele, Pualele, ʻAmaʻu, or Hapuʻu, from the wild plants resorted to" (1992:204). Once Kamehemeha realized that his people were suffering, he "declared all the sandalwood the property of the government and ordered the people to devote only part of their time to its cutting and return to the cultivation of the land" (Kamakau 1992:204). In the uplands of Kailua, a vast plantation named Kuahewa was established where Kamehameha himself worked as a farmer. Kamehameha enacted the law that anyone who took one taro or one stalk of sugarcane must plant one cutting of the same in its place (Handy and Handy 1991). While in Kailua, Kamehameha resided at Kamakahonu, from where he continued to rule the islands for another nine years. He and his high chiefs participated in foreign trade, but also continued to enforce the rigid *kapu* system.

By the early nineteenth century the *kapu* cattle given to Kamehameha by Vancouver had multiplied to the extent that they were becoming a scourge for the native planters Waimea region. To protect the upland agricultural fields from the grazing cattle, sometime between 1813 and 1819, Kamehameha ordered that a wall be built from the northern boundary of Waikōloa Nui to near Puʻu Huluhulu (Barrere 1983). The wall was designed to keep wild cattle in Waikōloa Nui, and out of the more agriculturally productive areas on the Waimea side. This wall was called Kauliokamoa after the *konohiki* who oversaw its construction (Wolforth 2000).

The Death of Kamehameha I and the Abolition of the Kapu System (1819-1820)

Kamehameha I died on May 8, 1819 at Kamakahonu in Kailua-Kona, and the changes that had been affecting the Hawaiian culture since the arrival of Captain Cook in the Islands began to accelerate. Following the death of a prominent chief, it was customary to eliminate all of the regular *kapu* that maintained social order and the separation of men and women, elite and commoner. Thus, following Kamehameha's death, a period of *ʻai noa* (free eating) was observed along with the relaxation of other traditional *kapu*. It was the responsibility of the new ruler and *kahuna* to re-establish *kapu* and restore social order, but at this point in history traditional customs were altered:

> The death of Kamehameha was the first step in the ending of the tabus; the second was the modifying of the mourning ceremonies; the third, the ending of the tabu of the chief; the fourth, the ending of carrying the tabu chiefs in the arms and feeding them; the fifth, the ruling chief's decision to introduce free eating (*ʻainoa*) after the death of Kamehameha; the sixth, the cooperation of his aunts, Ka-ahu-manu and Ka-heihei-malie; the seventh, the joint action of the chiefs in eating together at the suggestion of the ruling chief, so that free eating became an established fact and the credit of establishing the custom went to the ruling chief. This custom was not so much of an

> innovation as might be supposed. In old days the period of mourning at the death of a ruling chief who had been greatly beloved was a time of license. The women were allowed to enter the heiau, to eat bananas, coconuts, and pork, and to climb over the sacred places. You will find record of this in the history of Ka-ula-hea-nui-o-ka-moku, in that of Ku-ali‘i, and in most of the histories of ancient rulers. Free eating followed the death of the ruling chief; after the period of mourning was over the new ruler placed the land under a new tabu following old lines. (Kamakau 1992: 222)

Immediately upon the death of Kamehameha I, Liholiho (his son and to be successor) was sent away to Kawaihae to keep him safe from the impurities of Kamakahonu brought about from the death of Kamehameha. After purification ceremonies Liholiho returned to Kamakahonu:

> Then Liholiho on this first night of his arrival ate some of the tabu dog meat free only to the chiefesses; he entered the *lauhala* house free only to them; whatever he desired he reached out for; everything was supplied, even those things generally to be found only in a tabu house. The people saw the men drinking rum with the women *kahu* and smoking tobacco, and thought it was to mark the ending of the tabu of a chief. The chiefs saw with satisfaction the ending of the chief’s tabu and the freeing of the eating tabu. The *kahu* said to the chief, “Make eating free over the whole kingdom from Hawaii to Oahu and let it be extended to Kauai!” and Liholiho consented. Then pork to be eaten free was taken to the country districts and given to commoners, both men and women, and free eating was introduced all over the group. Messengers were sent to Maui, Molokai, Oahu and all the way to Kauai, Ka-umu-ali‘i consented to the free eating and it was accepted on Kauai. (Kamakau 1992: 225)

When Liholiho (Kamehameha II) ate the *kapu* dog meat, entered the *lauhala* house and did whatever he desired, it was still during a time when he had not reinstituted the eating *kapu* but others appear to have thought otherwise. Kekuaokalani, caretaker of the war god *Kū-Kailimoku*, was dismayed by his cousin’s (Liholiho) actions and revolted against him, but was defeated.

With an indefinite period of free-eating and the lack of the reinstatement of other *kapu* extending from Hawai‘i to Kaua‘i, and the arrival of the Christian missionaries shortly thereafter, the traditional religion had been officially replaced by Christianity within a year following the death of Kamehameha I. By December of 1819, Kamehameha II had sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the ‘*aumakua* worship, to continue (Oliver 1961; Kamakau 1992). Liholiho moved his court to O‘ahu, lessening the burden of resource procurement for the chiefly class on the residents of Hawai‘i Island. With the end of the *kapu* system, changes in the social and economic patterns began to affect the lives of the common people.

Kohala 1820-1848: A Land in Transition

In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawai‘i. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the *ali‘i*, who were already exposed to western material culture, welcomed the opportunity to become educated in a western style and adopted their dress and religion. Soon they were rewarding their teachers with land and positions in the Hawaiian government. During this period, the sandalwood trade wreaked havoc on the lives of the commoners, as they weakened from the heavy production, exposure, and famine just to fill the coffers of the *ali‘i*, who were no longer under any traditional constraints (Oliver 1961; Kuykendall and Day 1976). The lack of control of the sandalwood trade was to soon lead to the first Hawaiian national debt as promissory notes and levies were initiated by American traders and enforced by American warships (Oliver 1961). The Hawaiian culture was well on its way towards Western assimilation as industry went from the sandalwood trade, to a short-lived whaling industry, to the more lucrative, but environmentally destructive sugar and cattle industries.

Some of the earliest written descriptions of Kohala come from the accounts of the first Protestant Missionaries to visit the island. In 1823, the missionary William Ellis described Waimea as a fertile, well watered land “capable of sustaining many thousands of inhabitants” (Ellis 1969:399). Ellis notes that another missionary, Asa Thurston, had counted 220 houses in the area, and estimated the population at between eleven and twelve hundred. During his travels along the coast of North Kohala Ellis noted that most of the villages were empty as the men of the region had been ordered to the mountains by the King to collect sandalwood. He writes:

> About eleven at night we reached Towaihae [Kawaihae], where we were kindly received by Mr. Young. . . . Before daylight on the 22nd, we were roused by vast multitudes of people passing

> through the district from Waimea with sandal-wood, which had been cut in the adjacent mountains for Karaimoku, by the people of Waimea, and which the people of Kohala, as far as the north point, had been ordered to bring down to his storehouse on the beach, for the purpose of its being shipped to Oahu. There were between two and three thousand men, carrying each from one to six pieces of sandal-wood, according to their size and weight. It was generally tied on their backs by bands of ti leaves, passed over the shoulders and under the arms, and fastened across their breasts. (Ellis 2004:405-406)

Ellis also describes another of his travelling companion's journey to Mauna Kea, and the early use of the herds of cattle that were by that time roaming the mountain side:

> Although there are immense herds of them, they do not attempt to tame any; and the only advantage they derive is by employing persons, principally foreigners, to shoot them, salt the meat in the mountains, and bring it down to the shore for the purpose of provisioning the native vessels. But this is attended with great labour and expense. They first carry all the salt to the mountains. When they have killed the animals, the flesh is cut off their bones, salted immediately, and afterwards put into small barrels, which are brought on men's shoulders ten to fifteen miles to the sea-shore. (Ellis 2004:412)

In 1822 John P. Parker, originally of Newton, Massachusetts, was one of the early foreigners granted permission to hunt bullock for the crown (Escott 2008). The wild cattle were often captured in bullock pits seven to eight feet long by four feet deep that were covered over with sticks and a thin layer of dirt; they were also hunted with guns, and in later years, after the arrival of *vaqueros* from Central and South America, lassoed from horses (Wilkes 1845). By about 1830 Parker would go on to found Parker Ranch, which would eventually grow to become the largest cattle ranch on the island (Henke 1929).

The population of South Kohala continued to reside either near the shore or in the uplands of Waimea throughout the first half of the nineteenth century, but with the arrival of foreigners in Hawai'i, the introduction of a western economy, and the rise of the sugar and cattle industries, life in Kohala began to change drastically. Soon after the arrival of foreigners, the landscape of Waimea also began to change dramatically; initially through deforestation from the collection of sandalwood, followed by the introduction of cattle to these lands (Rechtman and Prasad 2006). Foraging cattle wreaked havoc on the agricultural fields and were responsible for a flurry of wall building as people tried to keep the feral cattle out of their fields and homes. From the 1820s until the 1840s a sugar mill operated in the Waimea area. New crops, such as Irish potatoes, watermelons, cabbage, onions, tomatoes, mulberries, figs, and beans were also introduced in Historic times. For a while, agricultural products from Waimea replenished the cargo ships at Kawaihae Harbor, and in the late 1840s many of the potatoes grown in the Waimea area were shipped to California to help feed the gold rush (Haun et al. 2003). However, commercial ventures soon replaced traditional agricultural practices, and the Waimea landscape was substantially altered as a result of this post-contact change (Rechtman and Prasad 2006).

In 1830 the appointed governor of Hawai'i Island, Kuakini, moved to Waimea to oversee and improve on the government cattle industry. He ordered the construction of corrals and had a twelve mile stretch of trail between Waimea and Kawaihae widened (Escott 2008). According to an 1830 Missionary Commission Report (Lyons 1875) another trail followed the boundary of Waikōloa and Lālāmilo *ahupua'a* from Waimea to the coastal village of Puakō, passing by the current project area. Hawai'i Registered Map Nos. 574 (prepared by Kaelemakule – no date; Figure 20), 1080 (prepared by C. J. Lyons and W.A. Wall in 1885; see Figure 19), and 2993, (prepared by Chas L. Murray in 1929; Figure 21), all show an "old trail" following the boundary between the two *ahupua'a*. A September 10, 1836 article in the *Sandwich Island Gazette* describes the terrain traversed by the trail:

> . . . [the trail] consists of a gradual descent of about 10 miles to the seaside. It is entirely composed of an uneven rocky waste, covered with long grass. This barren tract is untenanted and uncultivated. Rain seldom falls here and, besides the grass, nothing is seen to vary the monotony until you approach the coast, when the eye is relieved by the yellow blossoms of the Nohu [*Tribulus cistoides*]. (*Sandwich Island Gazette* September 10, 1836)

In 1835 Lorenzo Lyons, a minister from Waimea, trekked along this trail to the village of Puakō, which he briefly described as follows:

> Puako is a village on the shore, very like Kawaihae, but larger. It has a small harbor in which native vessels anchor. Coconut groves give it a verdant aspect. No food grows in the place. The people make salt and catch fish. These they exchange for vegetables grown elsewhere. (Lyons in Doyle 1953:85)

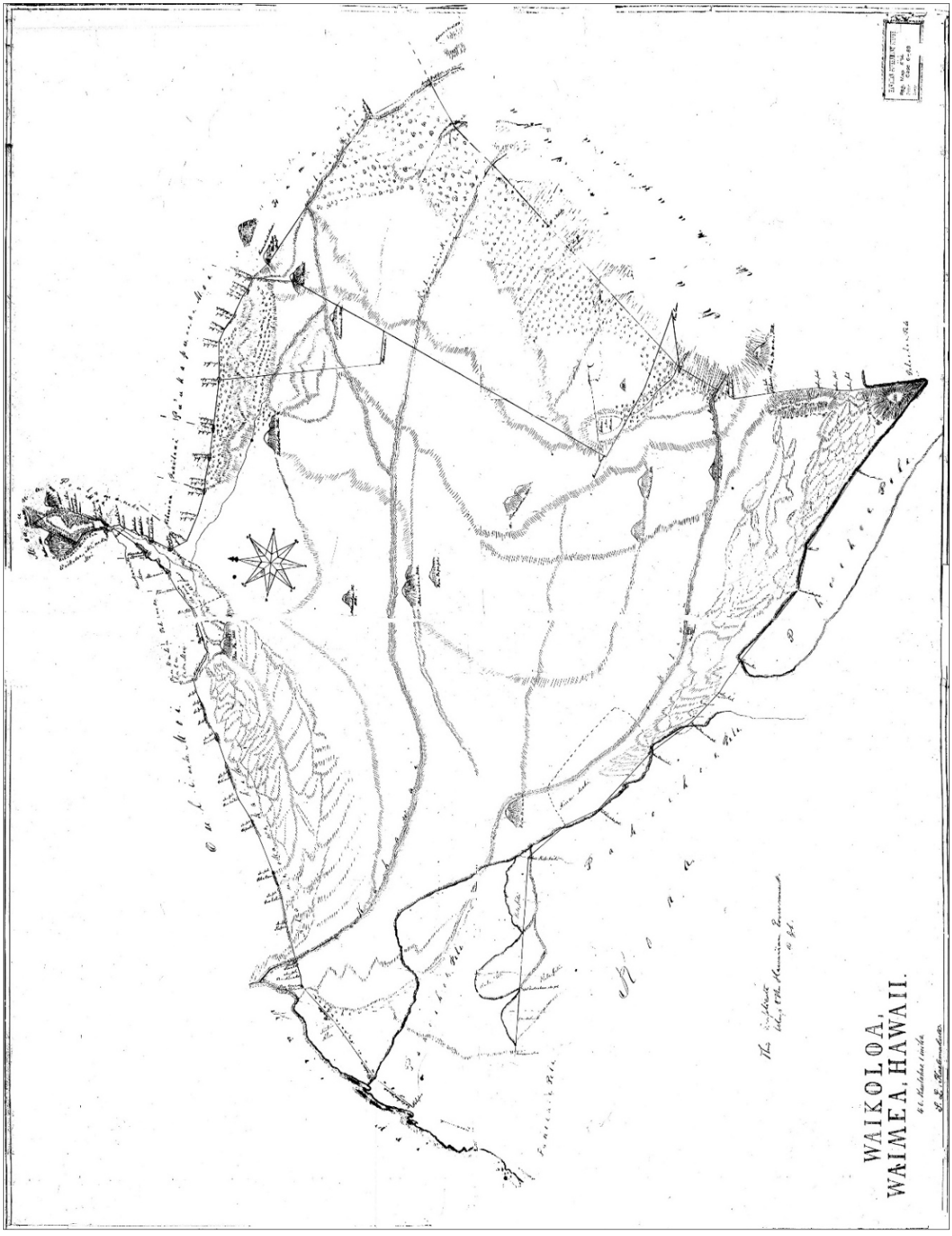

Figure 20. Registered map No. 574 showing an old trail along the Lālāmilo/Waikōloa *ahupua'a* boundary (prepared by Kaelemakule, n.d.).

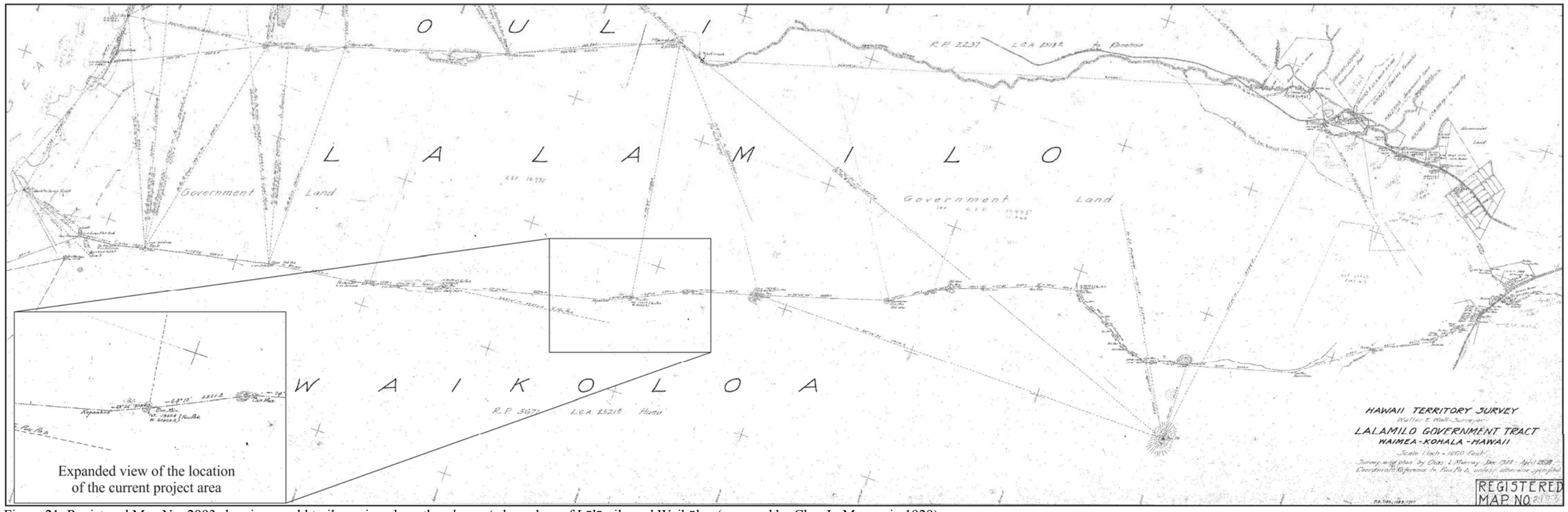

Figure 21. Registered Map No. 2993 showing an old trail running along the *ahupua'a* boundary of Lālāmilo and Waikōloa (prepared by Chas L. Murray in 1929).

The 1835 missionary census lists 6,175 people living in Kohala and another 1,396 people, including 500 men, 510 women, and 386 children, living in Waimea (Schmitt 1977). In 1837 there were sixty foreigners in Waimea employed as mechanics and bullock hunters (Brundage 1971); and in his report to the American Board of Commissioners to Foreign Missions in 1840, Lorenzo Lyons stated "in my field are sixty or seventy foreigners, from seven or eight different nations. They are beef catchers, sugar manufacturers, shoe makers, merchants, masons, doctors, formers, and what not" (Doyle 1953:118). By 1840, bullock hunting had drastically reduced the population of wild cattle on Hawai'i Island, so much so that a five year *kapu* was placed on hunting them solely for their hides and tallow (Bergin 2004). This lead to further efforts to tame, brand, fence, and herd privately owned cattle (Wilkes 1945). The decline of the whaling industry in Hawaiian waters during this time, combined with the *kapu* on killing wild cattle, lead to a period of economic hardship and population decline in the Waimea area (Escott 2008).

By the mid-nineteenth century, leeward settlement had shifted to the windward side of Kohala as the leeward, agriculturally marginal areas were abandoned in favor of more productive and wetter sugarcane lands. According to Tomonari-Tuggle (1988), the remnant leeward population nucleated into a few small coastal communities and dispersed upland settlements. These settlements were no longer based on traditional subsistence patterns, largely because of the loss of access to the full range of necessary resources. The wetter windward slopes of North Kohala and the Waimea plain were the focus of the shifting settlement pattern and they eventually became the population centers for the district. Tomonari-Tuggle clarifies some of the reasons for this migration:

> Outmigration and a demographic shift from rural areas to growing urban centers reflected the lure of a larger world and world view on previously isolated community. Foreigners, especially whalers and merchants, settled around good harbors and roadsteads. Ali'i and their followers gravitated towards these areas, which were the sources of Western material goods, novel status items which would otherwise be unavailable. Associated with the emergence of the market, cash-based economy, commoners followed in search of paying employment. (1988:33)

Throughout the first half of the nineteenth century the native population of the district declined rapidly as native populations were decimated by disease and a depressed birth rate. Epidemics in 1848 and 1849 killed more than 10,000 people in twelve months throughout the Hawaiian Islands (Tomonari-Tuggle 1988). In 1848 in North Kohala, Rev. Bond reported that 100 people had died within a three week period, and in October of that year he reported that a measles epidemic had nearly every resident of the district in the hospital (Damon 1927). Following these epidemics, the population of the district had been reduced to nearly half of the reported population in 1835; the number of coastal residents soon dwindled and most of the coastal villages were left to a few solitary residents. An 1848 description of the town of Waimea cited in McEldowney (1983:432) stated that "it can scarcely be said that there is any native population at all." This statement seems to sum up the demographic changes that were taking place as the native population had been severely reduced by disease, displacement, and the ongoing changes in land tenure.

Legacy of the Great Māhele (1848-1865)

By the middle of the nineteenth century, the ever-growing population of Westerners forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership in the Hawaiian Islands, and the Great *Māhele* became the vehicle for determining ownership of native lands. During this period, land interests of the King (Kamehameha III), the high-ranking chiefs, and the low-ranking chiefs, the *konohiki,* were defined. The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission (Chinen 1961:13).

During the *Māhele,* all lands were placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, and *Konohiki* Lands. All three types of land were subject to the rights of the native tenants therein. In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawai'i to legally set the boundaries of all the *ahupua'a* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries was authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were old native residents of the lands. The boundary information was collected between ca. A.D. 1873 and 1885 and was usually given in Hawaiian, but transcribed in English.

The disposition and distribution of the lands of Waimea was a complicated issue, and was a matter of much testimony and debate among Commissioners, *kama'āina* informants, and land petitioners. Waimea was a discrete land unit (see Figure 18) but considered by some to not be an *ahupua'a*; rather it was considered to be a *kalana* or *'okana*, a unit larger than an *ahupua'a*. To further complicate the issue, some of the land units within Waimea were considered

ahupua'a and others *'ili kupono*. As a result of the *Māhele* testimony and the Boundary Commission Testimony, many smaller *ahupua'a* names were dropped and the relatively independent *'ili kupono* were given *ahupua'a* status, and except for a portion of the Waikoloa *ahupua'a* (which was awarded as *konohiki* land), much of the Waimea area was retained as Crown Lands. Over 140 claims for Land Commission Awards (LCAw.) were made by native tenants within the Waimea area. Nearly all of these claims were for house lots or cultivated sections (Haun et al. 2003). Of the land commission awards reviewed by Kelly and Nakamura (1981:30), over twenty percent were issued to persons with non-Hawaiian surnames.

Lālāmilo Ahupua'a was awarded to William C. Lunalilo as part of LCAw. 8559-B. Lunalilo, who became the first popularly elected Hawaiian King in 1874, died at age thirty-nine just twenty-five days after assuming the throne (Kelly 1983). Seventeen *kuleana* were claimed within Lālāmilo (Haun et al. 2003), including four at the coast (listed as being within Puakō) and thirteen in the uplands (listed as being within Waimea). The four *kuleana* at the coast were all house lots that were not awarded, while the thirteen inland *kuleana*, which were awarded, were for house lots and cultivation. None of the *kuleana* were in the vicinity of the current project area.

Waikōloa (Nui) Ahupua'a was awarded to George Davis Hū'eu. Kamehameha I had originally given the land to George's father Isaac Davis. This award did not include the coastal areas of 'Anaeho'omalu and Kalāhuipua'a, which were retained by the crown; thus the Davis Hū'eu award was primarily restricted to the non-agricultural *pili* lands south of the agriculturally productive Lālāmilo area and *mauka* of the rich coastal resource area. Although at least twenty-six claims were made for *kuleana* in Waikōloa, only nine small residential lots were awarded near the town of Waimea (Maly and Maly 2002).

In the decades following the *Māhele* of 1848, which are characterized by a growing detraction from traditional subsistence activities, the population along the Kohala coast continued to decline and the inland agricultural fields were largely abandoned as they succumbed to the ravages of free-ranging cattle or were bought up by the burgeoning ranching and sugar industries. During this period the remnant leeward population of Kohala nucleated into a few small coastal settlements (such as Puakō in the vicinity of the current project area) or into dispersed upland habitations where they began building *kuleana* walls to enclose houses, gardens, and animal pens (Tomonari-Tuggle 1988). Walls were built not only to protect their homes and gardens from cattle and other free-ranging animals, but also to mark property boundaries as dictated by the new land tenure system that emphasized private land ownership. The economy also transitioned, becoming cash based and taxes were collected. Foreigners controlled much of the land and most of the businesses, and the native population was largely dependent on these foreigners for food and money (Haun et al. 2003).

The proceedings of the Land Commission ushered in changes in the traditional Hawaiian land tenure system that enabled foreigners to purchase lands which had previously been unavailable to them. During the middle to late 1800s Western businessmen established a number of diverse industries on these newly available lands. Letters written at the time of the *Māhele* indicate that by 1848 George Davis Hū'eu had already established a cattle corral, a goat corral, and house lots on lands adjacent to his roughly 95,000-acre Waikōloa award (Maly and Maly 2002). By that year, John Palmer Parker, founder of the Parker Ranch, had received two acres of land at Mānā where he built a family house and the first ranch buildings (Bergin 2004). In 1850 he purchased 640 acres surrounding the Mānā lands, and in 1851 he purchased another 1,000 acres. A year later, in 1852, Kamehameha III granted Parker a lease on the lands of Waikōloa (presumably Lālāmilo and neighboring lands to the north and east), some of which would eventually be deeded to the ranch by outright purchase (Bergin 2004). By the mid-1850's John Parker had turned most of the day to day operations of Parker Ranch over to his son, John Palmer Parker II.

By 1859, disputes regarding the boundary between the *ahupua'a* of Pā'auhau (in the Hāmākua District) and Waikōloa had arisen between Hū'eu and Parker. The boundary issue was quickly resolved, but the dispute lead Lot Kamehameha, Minister of the Interior, to recommended to W. S. Spencer, Interior Department Clerk, that boundary testimony for all *ahupua'a* be collected:

> From conversations with Surveyor Wilkes, I have come to the conclusion to recommend to H. Mj's. Government to have all Government Lands, especially in Hamakua and Waimea, correctly surveyed, if possible excepting those tracts of Lands already sold to private parties. My reasons for recommending this step are that the Boundaries can only be defined and explained from the evidence of very old people now living in these Districts, and if the Government hesitates or delays this evidence, there will be shortly be no guide or information to enable them to come to a decision, as to the correct Boundaries. The people being all old and not likely to remain long as living evidences, in this world. . . (Department of the Interior letter dated May 29, 1859; in Maly 2002:70)

Disputes over the boundaries of Waikōloa Nui Ahupua‘a, belonging to G. D. Hū‘eu, and the neighboring Crown lands of Waimea also soon arose. Testimony regarding the boundaries of Waikōloa Nui were heard on August 8 and 9, 1865 at Waimea. Several individuals knowledgeable of the boundaries testified, including Mi 1st who swore:

> I live on Waikoloa – I am a kamaaina of the lands in dispute. The name of the large land is Waimea – I am a witness for George Davis and also for the Rex [King] – Waimea is a Kalana – which is the same as an island divided into districts – there are eight Okana in Waimea. In those Okana are those lands said to extend out (hele mawaho). These lands came in to the possession of Kamehameha I who said to Kupapaulu, go and look out to of the large lands running to the sea, for John Young and Isaac Davis. Kupapaulu went to Keawekuloa, the haku aina, who said if we give Waikoloa to the foreigners they will get Kalahuipua [Kalahuipuaa] and Anaiomalu [Anaehoomalu] (two lands at the beach) then your master will have no fish. So they kept the sea lands and gave Waikoloa to Isaac Davis. John Young asked my parents if it was a large land they said, the black aa was Napuu, and the good land Waimea.
>
> They kept all the valuable part of the lands, and gave the poor land outside to Isaac Davis. They kept Puukapu, Pukalani, Nohoaina, Kukuiula (above the church), and Paulama; and gave Waikoloa to Isaac Davis. The other Waikoloa [Waikōloa Iki, or Lālāmilo], this side of the stream dividing them, was the King’s. It comes down along the stream by Mr. Lyon’s, then along the ditch, then along the wall of Puuloa, to Ahuli on the King's land, to the round hill, Uleiokapihe, and is cut off here by Davis’ Waikoloa. - The wall was the boundary below, between Waikoloa of Isaac Davis and the land of the King, Kamehameha I. The latter built it by Kauliakamoa [Kauliokamoa]; to keep the cattle off from the King’s land. The boundary runs to Liuliu, and the pili was all South, on Davis’ land; then I know along an old road, Puupa, Waikoloa being South and Waimea North of the road, then to Kaniku. That is all I know.
>
> Cross. - My parents heard the command of Kamehameha I to Kupapaulu, and they told me, and also about John Young's asking about the land.
>
> I never heard that Puukapu, Nohoaina, Pukalani, and Paulama extended out to the pili. A road divided the land of the King and that of I. Davis.
>
> Waikoloa. - The wall was built to keep off the cattle, and to mark the land. The church is on the King’s land. When Kalama measured Waikoloa he took in the church, I heard. I went with Kalama some of the time. Kalama said leave the old boundary and make a straight boundary, so I left them, lest Davis’ land would go to the King. The boundary as I know it is from the English school house along a hollow, to the ditch near to Hoomaloo; thence to puu Makeokeo; thence to hills outside of Ahuli. The church is on Paulama which joins Waikoloa. (Boundary Commission, Volume A, No. 1 pg. 6)

Several named points along the boundary between Waikōloa and Lalāmilo are specified in 1865 Boundary Commission hearings. The points most proximate to the current project area include Puu Waewae, Kaala, Kapae, Pooholua, and Pohakau, Kapaakea, Palinui Puu Ananui, and Liuliu (Figure 22). Unfortunately no meanings for these names or legends associated with them are given. Other testimony indicates that Waikōloa Ahupua‘a was a place for bird catching. Ehu, among others, testifies that, “Waikoloa was the land that had the birds” (Maly 1999:88).

Ranching other Historic Industries in the Lālāmilo-Waikōloa Area (1865-1942)

By the mid-1860s the Waimea Grazing and Agricultural Company, founded by Robert C. Janion and William H. Green in 1861, and joined by F. Spencer and Company soon thereafter, had acquired considerable strategic assets around Waimea in an attempt to monopolize the livestock industry in the region (Bergin 2004). From the outset, Spencer, Janion, and Green maintained an adversarial relationship with Parker Ranch, and land disputes and allegations cattle rustling were common occurrences between these two competing entities. During the early 1860s Parker successfully thwarted Janion’s men from harvesting unbranded cattle on his lands, but attacks by Frank Spencer contesting Parker’s claim to more than 17,800 acres in Ka‘ohe and Kemole were more difficult to resolve, and were still ongoing when John Palmer Parker, the founder of Parker Ranch, died on August 20, 1868 (Bergin 2004). At the time Parker Ranch controlled about 47,000 acres of land in the region, including the Lālāmilo portion of the current project area. The ranch lands were divided evenly between John Parker II and his adopted son and nephew, Sam Parker Sr. (Bergin 2004).

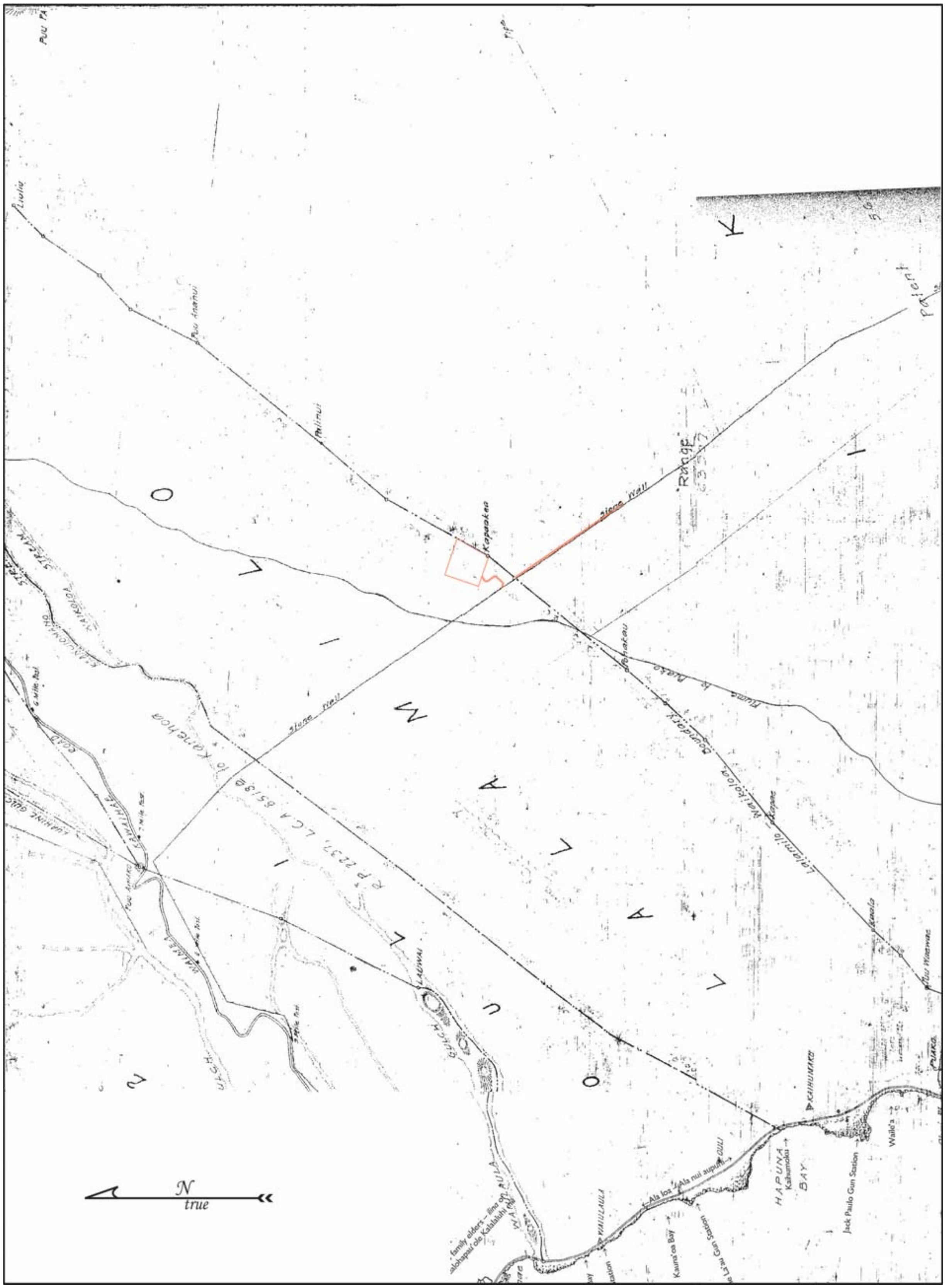

Figure 22. Portion of Hawai‘i Registered Map No. 2786 (prepared by Wright 1917 and annotated by Maly 1999) showing the current project area (outlined in red).

On July 2nd, 1868, G. D. Hūʻeu leased his remaining lands in Waikōloa Nui to the Waimea Grazing and Agricultural Company for a twenty year period (he had previously sold roughly 700 acres to Claude Jones on October 25th, 1866; Maly and Maly 2002). With the acquisition of this land, the Waimea Grazing and Agricultural Company became the largest ranching operation on the island (Escott 2008). Under the terms of the lease the Hūʻeu family was allowed to continue grazing their 1,000 head of cattle, 1,000 head of sheep, and 100 horses on the Waikōloa lands (Escott 2008).

Despite the growth of the ranching industry, Lorenzo Lyons estimated that by 1867 the population of Waimea was only four hundred people; during the 1870s the town of Waimea contained five stores and a hotel (Doyle 1945). An 1877 *Report of the Royal Commissioners on Development of Resources* documents the effects of cattle ranching on the environment of the Kohala-Waimea region, and the resultant out migration of the native population during this period:

> The forests on the Kohala mountains are dying rapidly. The land is mostly for grazing purposes, though on the mountain potatoes of fine quality can be raised in large quantities. In sheltered places, coffee would doubtless grow, but owning to the sparseness of the population and the superior attractions to other parts of the district, this part will hardly soon be settled. The once fertile and populous plain of Waimea looked sterile and desolate when visited by the Commission - a painful contrast to Kohala loko on the other side of the mountain.
>
> The complaint of the people is well founded. The water they use is fouled in many places by cattle, horses and other animals, and as the stream is sluggish it has no chance to free itself of impurities, and the water used by the people in their houses must be a cause of disease and death, especially to the children . . . It is little wonder that with his crops trodden out by the sheep or cattle of his stronger neighbors, his family sickened perhaps to death by the polluted waters, that the small holder should yield to despair, and abandoning his homestead seek employment in some other district, usually without making another home . . .
>
> The plains of Pukapu and Waimea·are subject to high winds, aggravated by the loss of the sheltering forests of former days. The soil however is very good in many places for sugar cane and other products. To develop its best resources, efforts must be made to restore the forests and husband the supply of water at their sources to furnish a supply for agricultural purposes. At present the lands are used almost exclusively for grazing purposes. Although the proprietors and lessors are probably not averse to the establishment of agricultural enterprises, it is to be feared that the denudation of the neighboring mountains and plains of the forests will render the climatic conditions unfavorable to success.
>
> It would seem that a wise appreciation of the best interests of this district, even of the grazing interests themselves, would lead to the decrease of the immense herds which threaten not only Waimea but even Hamakua with almost irreparable disaster. It is to be feared that they will in time render a large part of the land of little value even for grazing purposes. Owing to the increasing frequency and severity of droughts and consequent failure of springs. Some thousands of cattle are said to have died this last winter from want of water, and the works erected in Waimea for the purpose of trying out cattle have been idle for months for want of water.
>
> The commission do not propose here to discuss fully the vexed Questions of the causes of the diminution of the forests, but in view of the fact that they are diminishing and the streams and springs diminishing a corresponding rations, also that with the cattle running upon the lands as at present, any effort to restore them must be futile and any hopes of their recuperation vain, the Government, if it would wish to preserve that part of the island of Hawaii from serious injury, must take some steps for reclaiming the forests.
>
> In this connection we would say that it is unfortunate that large tracts of Crown and Government lands have been lately leased on long terms for grazing purposes, without conditions as to their protection from permanent injury, at rates much lower than their value even as preserves for Government purposes or public protection. The commission deem (sic) this a matter of grave importance, challenging the earnest attention of the Government, and involving the prosperity of two important districts (in Maly and Maly 2002:58-59).

By the late-1870s, largely due to persistent drought conditions within its grazing lands, the Waimea Grazing and Agricultural Company went out of business, and its herd was purchased by Parker Ranch (Parker Ranch would also eventually acquire the lease of Waikōloa Ahupuaʻa; Bergin 2004). Francis Spencer formed Puʻuloa Sheep and Stock Company, and continued to raise sheep in Waikōloa and neighboring lands. In October of 1876 Spencer sold his interest in the sheep ranch to George W. Macfarlane; included in this transaction were the Waikoloa Nui lands lease from G. D. Hūʻeu (Maly and Maly 2002). George Bowser, the editor of *The Hawaiian Kingdom Statistical and Commercial Directory and Tourists Guide*, visited Waimea in 1880 and stayed at Spencer's house. Browser writes:

> . . . Waimea has always been a place of some considerable importance, and there are around it several pretty homesteads, notably the residences of Mr. F. Spencer and the Reverend Lyons. From Mr. Spencer's veranda there is a striking view of Maunakea, the summit of which was at this time of the year still in its winter robe of snow. The snow never leaves this mountain top entirely, but the position of the snow-line varies considerably with the season of the year, and also from one year to another, according to the weather which characterizes them. The country all round is chiefly suitable for grazing, and, besides innumerable wild cattle, descended, no doubt, from those which Vancouver gave to Kamehameha I, there are some 20,000 head depastured in the neighborhood, the property of Mr. Parker, who has, besides, some large droves of horses, probably numbering a thousand head in all. Mr. Spencer has turned his attention chiefly to sheep farming, and occupies a large tract of country with his flock of 15,000 sheep and 15,000 goats. Waimea itself, although of immemorial age, and once populous, is now only a scattered village, with but two stores and a boarding and lodging house and coffee saloon. (Bowser 1880:540)

Upon leaving Waimea George Browser set out for Puakō, travelling along a trail that passed by the vicinity of the current project area. Browser provides the following description of the journey and the coastal village:

> . . . I made my start from the house of Mr. Frank spencer, leaving the Kohala district, I must say, with much regret. Fifteen miles of a miserably rough and stony road brought me to Puako, a small village on the sea-coast, not far from the boundary between the Kohala and Kona districts. There was nothing to be seen on the way after I had got well away from Waimea except clinkers; no vegetation, except where the cactus has secured a scanty foothold . . .
>
> At Puako there is some grief for the eye, in the shape of a grove of cocoa-palms, which are growing quite close to the water's edge. These had been planted right amongst the lava, and where they got their sustenance from I could not imagine. They are not of any great height, running from twenty to sixty feet. There are about a dozen native huts in the place. These buildings are from twenty to forty feet long and about fifteen feet high to the ridge of the roof. They only contain a single room each, and are covered with several layers of matting. (Bowser 1880:546)

Parker Ranch continued to expand their operations in the Waimea area throughout the 1870s and 80s, eventually acquiring the lease to roughly 95,000 acres of Waikoloa that had formerly belonged to the Waimea Agricultural and Grazing Company. A sketch map prepared J. S. Emerson in 1882 during the Hawaiian Government Survey of South Kohala (State Survey Division, Book 251:109; reproduced by Escott 2008; Figure 23), shows the Parker Ranch grazing lands at that time and the network of trails that ran through them. By the mid-1880s Sam Parker's poor business dealings had lead to a rapidly degenerating financial situation for Parker Ranch, and in 1887 the entire ranching operation was entrusted to Charles R. Bishop and Co. for a fee of $200,000 (Bergin 2004). With the move to trusteeship new managers were brought in to oversee the day to day operations at the ranch.

By the early 1900s Parker Ranch was under the direction of Alfred W. Carter, chosen as the guardian and trustee for Thelma Parker, John Parker III's daughter, upon his death at the age of nineteen. By this time Parker Ranch was operating on several large leased parcels, but the fee simple holdings amounted to only 34,000 acres (Bergin 2004). Early on in his tenure as ranch manager, Carter concentrated on acquiring and converting more of the ranch's lands from lease to fee. In 1903, with only a short period left on its lease, Carter acquired nine-tenths interest in the Waikōloa Nui lands from Ms. Lucy Peabody for $112,000, securing important grazing lands for the ranch (Bergin 2004). Soon thereafter, Carter purchased the adjacent lands of ʻŌuli, adding another 4,000 acres to the ranch's holdings that bridged the former property lines *makai* of Waimea Town. He also acquired the Puʻuloa Sheep and Stock Company, encompassing over 3,700 acres and including the Keʻamuku Sheep station in Waikōloa, which he converted to cattle ranching over the next decade. In 1906, on behalf of Thelma Parker, Carter bought out Sam Parker's half-interest in Parker Ranch for a sum of $600,000. Other important purchases made by Carter during the first dozen or so years of his trusteeship included Humuʻulu, Kaʻohe, Waipunalei, and Kahuku Ranch (Bergin 2004).

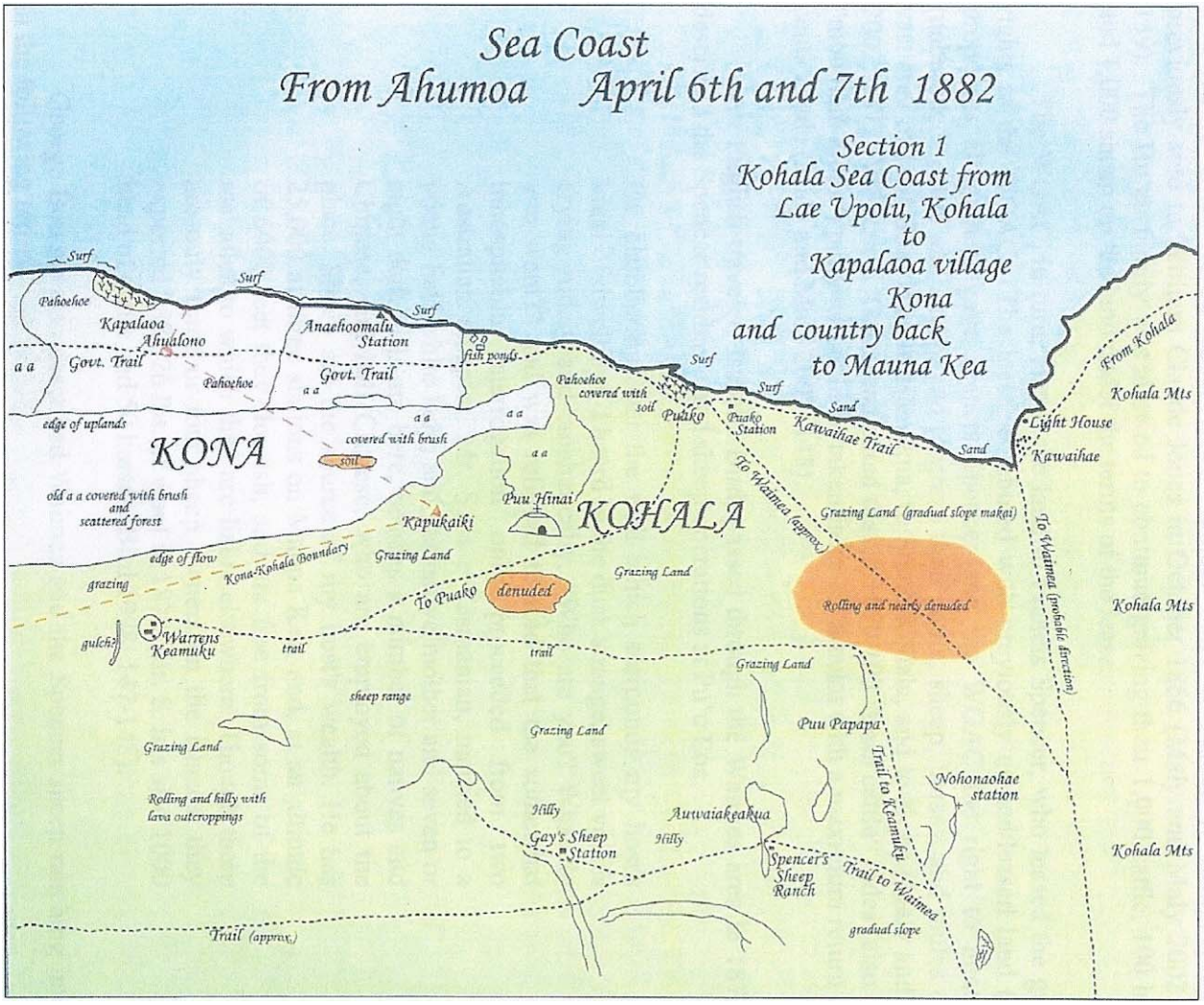

Figure 23. J. S. Emerson's sketch map of the South Kohala Sea Coast (from Escott 2008:43)

A few years prior A. W. Carter first being appointed Thelma Parker's guardian and trustee, Mr. Wilmot I. Vredenberg, a British national, during an 1895 hunting trip to South Kohala made a chance discovery of sugarcane growing wild in the Puakō area that ushered in a brief sugar industry in the coastal lands of Lālāmilo. Vredenberg immediately took the sugarcane to Robert Hind and his son John who had founded the Hāwī Mill and Plantation Company in North Kohala in ca. 1880 (Puakō Historical Society 2000). John Hind described this chance encounter, which would soon lead to the establishment of the short-lived Puakō Sugar Plantation (ca. 1895-1913):

> Mr. W. I. Vredenberg one Sunday came to Hawi in a state of considerable excitement, with four or five sticks of fine looking cane strapped to his saddle, which, as he put it, he discovered at Puako the day before while on a shooting trip. This cane was grown without irrigation, and he enthusiastically announced there were large areas of as good land as that on which these sticks were grown.... Conditions appeared extremely favorable.... Soil was analyzed... a well was sunk (about ten feet) water analyzed and found to contain no more salt water than other plantations, using well water. An experimental plot was planted, which for growth exceeded anything I had ever seen. (Hind n.d.:46-47)

The Hinds, excited by the prospects of a new plantation, soon entered into negotiations with the Parker Ranch for land at Puakō. Parker Ranch at that time used the lands around the bay, which they had purchased from Lunalilo, as a winter range, and they occasionally shipped cattle from there (Puakō Historical Society 2000). The Hinds were able to trade their rights to a piece of land in Hilo at Waipunalei for a swath of Parker Ranch land at Puakō, and they leased additional acreage from the Territory of Hawai'i (Maly 1999). These lands (between 1,500-1,800 acres) briefly became the Puakō Sugar Plantation.

Norman G. Campion, a marine engineer, was hired to design the Puakō sugar mill and oversee its construction on a four acre property along the shore (Grant No. 4856). A wharf was constructed first to facilitate the shipment of materials for mill construction. Then, as John Hind writes, "a fine up to date little mill with all the appurtenances which go with a modern plantation was installed [ca. 1905], on an ideal site, a hundred or so yards from the landing" (Hind ms.:50 in Maly 1999:122). The mill area housed crushing machinery, mixers, vats, and all the other mechanical necessities for the mill, along with dormitories and a camp for over three hundred workers, a company store, two schoolhouses, an office building, various storehouse and warehouse facilities, and a shed for honey processing machinery (Puakō Historical Society 2000). A rail line connected the mill operations with field operations. Other improvements to the plantation included the construction of an approximately eight-mile long wooden flume that carried water from Waikōloa Stream near Waimea to the coastal lands of the plantation (Maly 1999). Hawai'i Registered Map No. 2786 (prepared by Wright in 1917; see Figure 22) shows some of the Puakō plantation infrastructure and the route of the flume across the current project area. A map prepared by the Territory of Hawai'i for a Parker Ranch pasture lease in Lālāmilo Ahupua'a in 1928 (C.S.F. 4947) shows the flume originating at Keanuiomano Stream (to the north of Waikōloa Stream) and then continuing across Lālāmilo and Waikōloa *ahupua'a* (northwest of the current project area) to the coast near Puakō Bay (Figure 24).

Vredenberg, who had originally found the wild sugarcane at Puakō, was hired by the Hinds to manage the plantation (Puakō Historical Society 2000). In the beginning, Puakō Sugar Plantation was plagued by periods of heavy rain and floods, called freshets and semi-typhoons by John Hind (n.d), who lamented the destruction caused by the former, but came to welcome the latter, which "were of certain value, and over a series of years proved an asset" (Hind n.d.:48). The first sugar crop planted by the plantation (in ca. 1901) was decimated by a flood waters when several intermittently flowing streams overflowed their drainages (Puakō Historical Society 2000).

In 1901, soon after the establishment of the Puakō Sugar Plantation, the Inter-Island Telegraph Co. moved its wireless telegraphy station from Lā'au Point, Moloka'i to Puakō to establish a direct line of communication with the stations at Barber's Point, O'ahu and Lahaina, Maui (U. S. House of Representatives 1917). In 1903, the Territorial Legislature of Hawai'i granted a subsidy of $1,000 per month to the Inter-Island Telegraph Co. that stipulated, among other conditions, that a telegraph line between Puakō and the city of Hilo be built, enabling the residents of Hilo to quickly and securely transmit messages to Puakō, which could then be relayed to wireless stations on the other islands. Apparently the Inter-Island Telegraph Co. was not quick to build the telegraph line to Puakō, as illustrated in a commentary published in the August 30, 1904 edition of *The Hawaiian Star*:

> "We are now constantly hearing complaints of the wireless telegraph system. There is no fault found with the actual transmission of the messages across the water but merely with that part of the system where the telephone has to be used to carry the messages from the sender to the wireless station—Puako. Mistakes are thus frequently made in the wording. The transmission of a telegraphic message by telephone always arouses considerable curiosity along the line, and it is no exaggeration to say that every earcup is down and thus interfering with the efficiency of the instrument, and also making it difficult for the centrals to hear. This of course eliminates all privacy and every message becomes common property. Now according to the terms of the bill entitling the I. I. Wireless Telegraph Co. to a subsidy of $1000 per month from the government, it was made conditional that they should lay a land telegraph line from the wireless station (which is now at Puako) to Hilo. So far there is none laid. Instead of fulfilling theirs the company is drawing the subsidy and the public is left with the defective system. We know for a fact that in important messages where secrecy is necessary the telegrams have had to be carried by special messengers to the wireless office. The time is more than half gone and the public should see that the company carry out their in this respect, otherwise all the money will have been drawn by the company and the service still remain without its special telegraph "land line," which is therefore not in accordance with the governor's motto—economy." (*The Hawaiian Star*, Tuesday August 30, 1904 page 5)

By October of 1904 it was reported that "the necessary wire for the construction of the additional fifteen miles of telegraph line from Waimea to Puako, the wireless station, will arrive by the Kiuau, which will complete the telegraph line to Hilo" (*The Weekly Hilo Tribune*, Tuesday, October 18, 1904, page 5), and by February of 1905, F. J. Cross, the manager of the Inter-Island Telegraph Co. stated that "we have created and have been maintaining the wire telegraph line from Puako, Hawaii, to Hilo as required by the law under which we are paid by the Territory" (*Hilo Tribune*, 14 February 1905, pg. 6). Use of the Puakō telegraph line was apparently short-lived, as by 1911 the wireless station at Puakō had closed and been replaced by a new, more powerful station at Kawaihae (Department of the Interior 1912).

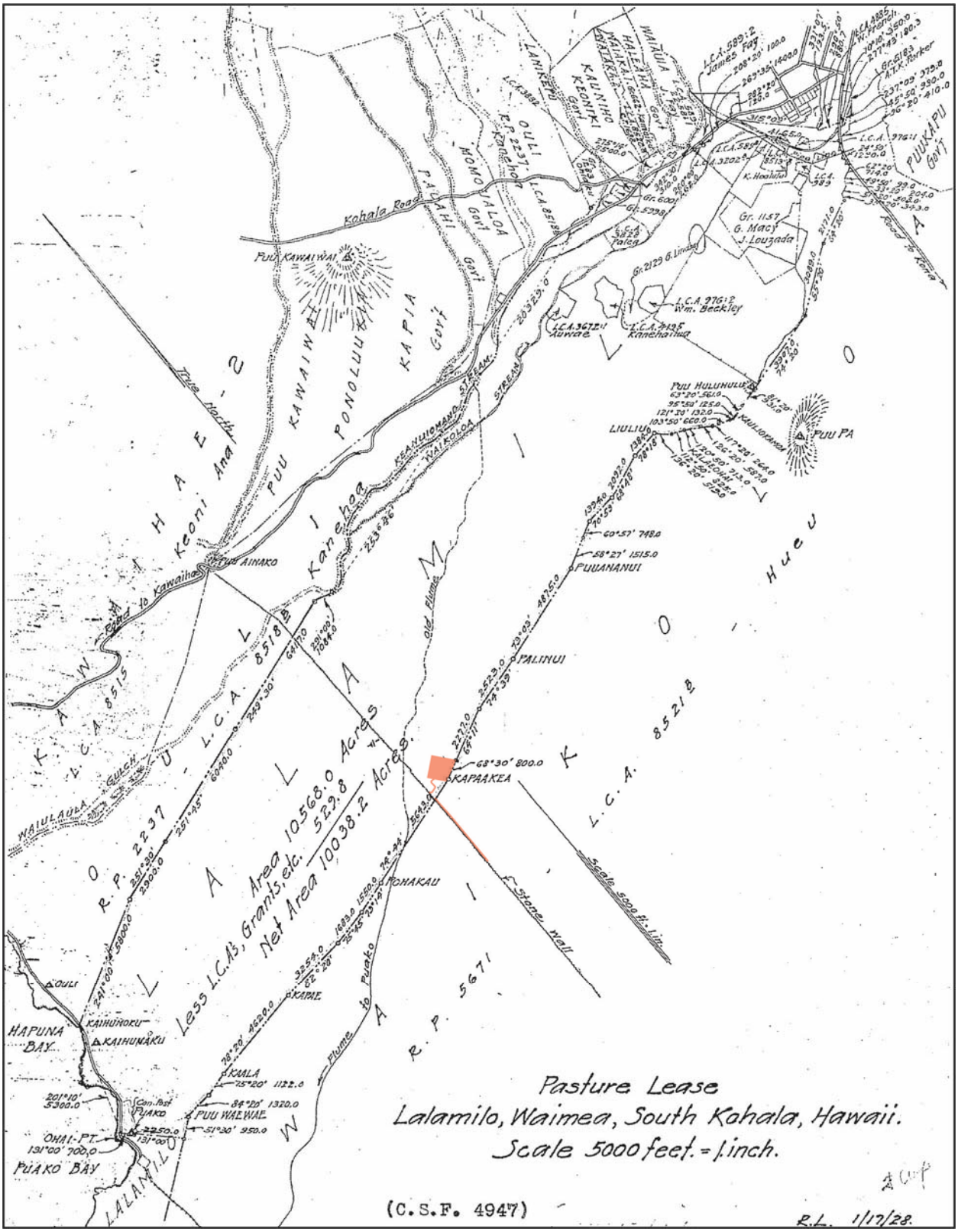

Figure 24. 1928 map (C.S.F. 4947 compiled by E.W. Hockley) showing the Parker Ranch lease of Lālāmilo and the route of the flume to Puakō (with the current project area in red).

With establishment of the Puakō Sugar Plantation and other associated industries at Puakō, and the resulting influx of population (workers and their families) that followed, the need arose for better transportation routes linking the isolated community of Puakō with the neighboring communities of Kawaihae and Waimea. The September 12, 1905 edition of the *Weekly Hilo Tribune* reported that:

> Wilmot Vredenberg, manager of the Puako Sugar Co., asked that an appropriation of $300 to $400 per month for the construction of a road between Kawaihae and Puako. He said that he had no "pull," and that during the five years that the Puako Plantation had been in existence, the Government has not expended $20 for clearing the trails of algeroba trees and rocks. (*The Weekly Hilo Tribune*, Tuesday, September 12, 1905, pg. 3)

By 1909, J. C. Searle had become the manager of the plantation. The March 25, 1909 *Evening Bulletin Industrial Edition* contains an article entitled "A History of the Progress of the Sugar Industry of Hawaii Since the Reciprocity Treaty of 1876," which contains a short description of the Puakō Plantation Company, briefly describing its history, lands, and mill:

> Puako plantation is situated on the leeward side of the Island of Hawaii, five miles from Kawaihae. The plantation consists of between 500 and 600 acres. Three hundred acres of this is good cane land located upon a low flat near the sea, the soil having been washed down from the mountains by freshets. The land was obtained by John Hind and his associates from the Parker Ranch in 1898, the first cane being planted by W. L. Vredenberg in 1899.
>
> Finding that owing to the small rainfall at Puako (and the surrounding country) was not enough to counteract the salt in the well water, arrangements were made with the Parker Ranch to take the Waiaka water of Waimea and a nine mile three board flume was built from the Waiaka Glulch to Puako Plantation.
>
> Four gasoline engines pump 2,500,000 gallons of water every ten hours for irrigation purposes.
>
> The plantation employs sixty-five men, all of whom work by the day. Like other plantations Puako is short of labor. The 1908 crop was about 403 tons and the 1909 crop is estimated at 800 tons.
>
> The mill buildings was [sic] erected in 1901. The six-roller Cora mill which was manufactured by Fulton Iron works of St. Louis, was erected in the same year. The mill has run very satisfactorily ever since and has not needed overhauling. Its principle features are the Lillie effect, Deming system of clarification, mud presses, etc. Room has been left for a new three-roller mill should it be needed. The cane carrier is supplied with revolving knives and bagasse is fed automatically to the furnaces.
>
> Two fast gasoline launches are maintained for carrying mail, passengers and freight between Kiholo, Puako and Kawaihae, connecting with the island steamers Mauna Kea and Mauna Loa, besides being available for trips to Kona and Kohala. (pg. 29)

According to John Hind (n.d.), while the floods that plagued the plantation's early years were an annoyance, the often strong, on-shore winds that dried the moisture from the soil, deposited salt in the fields, and broke the cane stalks during the following years were the real hindrance to growing sugarcane at Puakō. It was the winds and lack of water that eventually led to the closure of the plantation, after only a brief period of operation, in ca. 1913. Hind describes the difficulties faced by the plantation during its brief existence as follows:

> . . . the high winds proved disastrous. During the first year or two we only had a few severe visitations, but later, while we might be exempt for several months, and everything flourishing, we would have a continuation of storms, which at times would threaten to put us off the map. And I may say in passing, were it not for these heavy wind storms, and conditions could continue as they were during the first few months of our operations there, Puako would be worth $35,000.00 to $50,000.00 a year. I have seen the property more than once, look good for either of these amounts and after a three days blow, look like thirty cents. The principle cause of this sudden deterioration being the thorough drying out of the soil, leaving the salt, which could not be washed out in time, by subsequent irritations. We found a good rain was of very great benefit, and finally as a forlorn hope, after keeping tab, on the Waimea stream for over eighteen months, put in an eight mile flume, but strange as it may seem, the water failed just before the flume was finished. Mr. Carter the Manager of the Parker Ranch [c. 1903] attributed the failure to the unprecedented dry weather in the mountains, but as the stream, never after that, continued to flow with any degree of regularity, it would appear the shrinkage of forest area in the mountains was having its effect. Puako, as a sugar proposition, I was satisfied, was hopeless, so finally was closed down [by ca. 1913], and parts gradually sold off at what they would bring. . . (Hind n.d.:48-50)

A letter in the January, 1913 edition of the *American Sugar Industry*, however, reported that by May 22 of the previous year:

> One small sugar plantation has gone out of business as such. Puako Plantation, on Hawaii, is now part of the Hind stock ranch, and the land formerly occupied by sugar cane is now planted in sorghum for fodder for Hind's cattle. The mill has been dismantled, the sugar-making machinery going to Hawi mill while the engines are being retained for irrigation purposes. (Vol. XV No.1:49)

Robert Hind, and his son John, continued to use the Puakō lands for various economic pursuits even after the failure of the Puakō Sugar Plantation. According to Maly (1999) the Hinds extend their ranching interests in the area to include a *kiawe* feed lot and cattle shipping operation, and they also made honey and charcoal on their lease lands. The Hind's lease was located *makai* of the Parker Ranch grazing lands in Waikōloa and Lālāmilo *ahupua'a*. Thelma Parker, who had come of age to inherit the Parker Ranch holdings in 1912, reworked the legal arrangement with A. W. Carter, making the trustee of her properties for the foreseeable future (Bergin 2004). Thelma, who had married Henry Gaillard Smart, gave birth to the next Parker Ranch heir, Richard Palmer Kaleiokū Smart, on May 21, 1913. Soon after the birth (in 1914 and 1915 respectively) both Thelma and Henry Smart passed away, leaving baby Richard parentless (Bergin 2004).

In 1914, Alfred W. Carter, on behalf of Parker Ranch, filed a petition against the Territory of Hawai'i and sixty-two other individuals over the appurtenant water rights to Waikoloa Stream for the purposes of irrigation (Haun et al. 2003). Carter, in an effort to protect the ranch's water-rights, claimed that the Territory had wrongly diverted waters from the stream in 1905 when they dammed it and ran pipes to Waimea Village, lessening the flow of water to the Parker Ranch lands in Waikōloa, Lālāmilo, and 'Ōuli. While the courts ruled that the Territory of Hawai'i is the legal owner of the waters of the stream, they also decided that the residents of the *ahupua'a* had the right to use such water for domestic purposes. These purposes included watering livestock and irrigation gardens. Testimony in this case was extensive and indicated that from time immemorial Waikoloa Stream had been tapped by a number of ditches or '*auwai,* and that the inhabitants of the area relied heavily on the water from Waikoloa Stream for the continued traditional existence. The firsthand accounts provided in the testimonies of the residents of the lands describe the Waikoloa Stream *'auwai* system and turn of the century agricultural practices in the Waikōloa Lālāmilo area (Haun et al. 2003). All surplus of the stream waters beyond that needed for domestic use was granted to Carter and the Parker Ranch as landowners.

With the Parker Ranch water rights understood, Carter began improving the ranch's range management practices by adding fence lines for controlled grazing and an improved water distribution system (Bergin 2004). Weed control measures, including the mechanical clearing of pasture and the planting of new grasses for better forage, were also implemented. By the time Carter acquired the Kohala Ranch Co., made up of the Pu'uhue and Puakea Ranches in North Kohala, in 1932 and 1946, Parker Ranch had grown to include roughly 327,000 acres of fee lands (Bergin 2004).

As a result of Carter's land acquisitions during the early to middle 1900s, the current project area became part of a much larger, consolidated Parker Ranch that operated throughout the Hāmākua, North and South Kohala Districts. New land use patterns within this expanded ranch property, quite different from the land use patterns just a half century earlier, dictated the need for improved routes of travel between different locations; as a result much of the old trail network of the South Kohala District was abandoned or replaced. While the Precontact trail between Puakō and Waimea followed the Lālāmilo/Waikōloa boundary, maps made as early as 1901 show the trail from Puakō to Waimea extending through the center of Lālāmilo Ahupua'a (see Figure 17). The 1923 U.S.G.S. Pu'u Hīnai quadrangle shows Puakō as a small village during this period with a few roads and houses along the coast, a coastal trail extending north to Kawaihae and south to Kīholo Bay, and a trail extending inland to Waimea, passing north of the current project area (Figure 25). By the 1940, the population of Waimea, at the center of Parker Ranch, had also expanded, and the lands in and around the town were divided into numerous house lots indicative of the new land tenure system.

Beginning in 1941, just months prior to the bombing of Pearl Harbor, with World War II already underway in Europe and Asia, the U.S. Army established an infantry headquarters in the Pu'ukapu area of Waimea (Bergin 2006). After the United States formally entered the war, the Army presence in Waimea expanded to include the U.S. Navy and Marines, and become one of the largest multi-force, U.S. military camps and training bases in the Pacific. Large areas of the town and the surrounding pastures were turned over to the U.S. Government for campsites housing approximately 20,000 soldiers. This cantonment would eventually come to be called Camp Tarawa. During World War II, and shortly thereafter, the lands surrounding the camp (including the current project area) were used as a firing range and as a training area for the U.S. Marines (Brundage 1971).

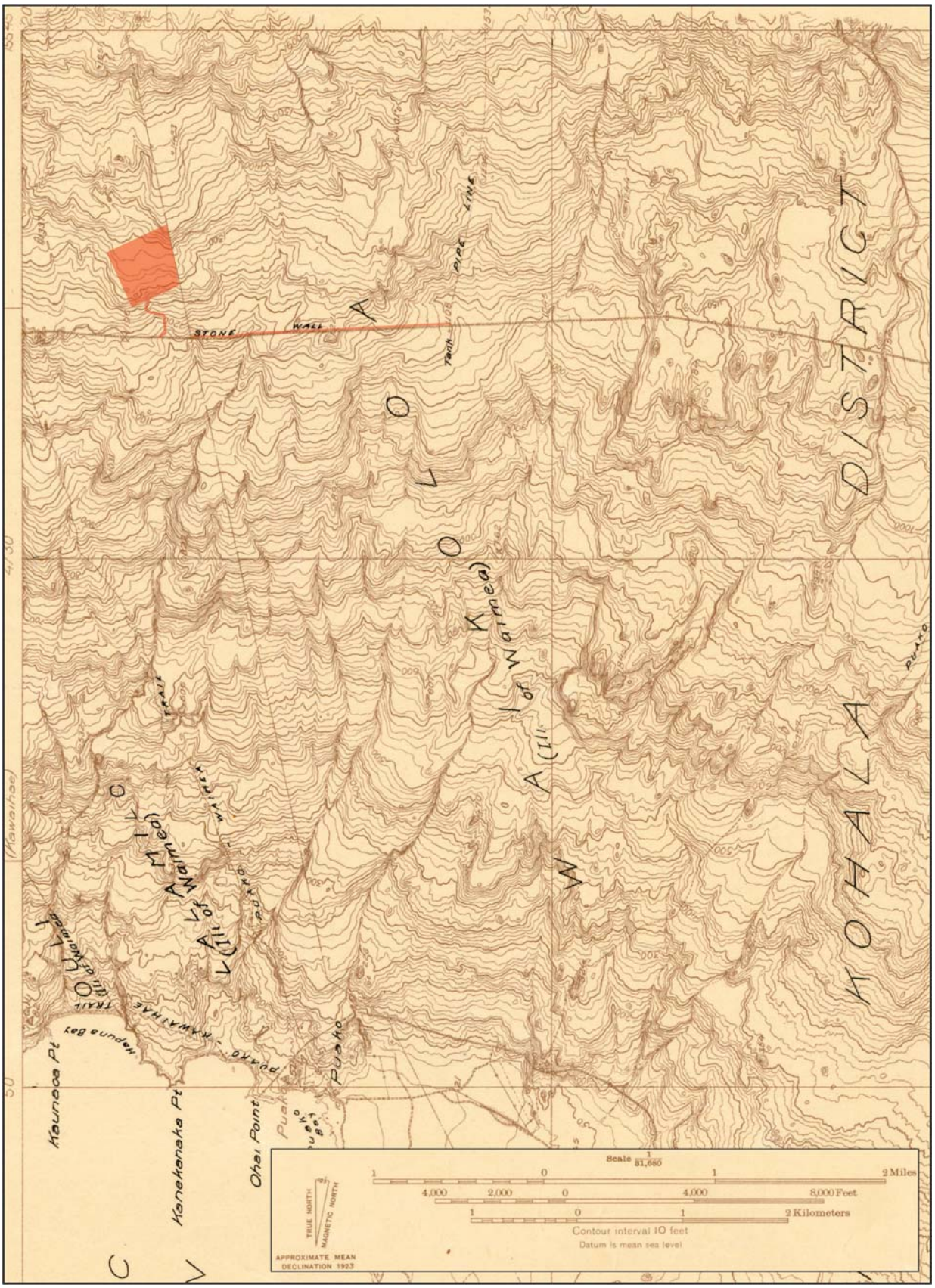

Figure 25. Portion of the 1923 U.S.G.S. Pu‘u Hinai quadrangle showing the current project area (in red).

The Waikoloa Maneuver Area and the Lālāmilo Firing Range (1943-1953)

In December of 1943, nearly 123,000 acres of land in the Waimea-Waikōloa area were leased by the U. S. War Department for use as a troop training area (Escott 2008). With this lease the current project area became part of the U.S. Navy's 91,000-acre Waikōloa Maneuver Area, which included the 9,141 acre Lālāmilo Firing Range, and extended from the coast to the Pohakuloa Training Area, and from the Waimea-Kawaihae Road to south of the Waikoloa Road. Much of the area was acquired through a license agreement with Richard Smart of Parker Ranch for the nominal fee of one dollar (Haun et al. 2010). According to Escott:

> . . . The military utilized portions of this property for troop maneuvers and weapons practice, while other areas served as artillery, aerial bombing and naval gun fire ranges. Troop exercises were conducted using 30 caliber rifles, 50 caliber machine guns, hand grenades, bazookas, flame throwers, and mortars. Larger ordnance and explosive (OE) or unexploded ordnance (UXO) items used included 37 millimeter (mm), 75 mm, 105 mm, and 155 mm high explosive (HE) shells, 4.2 inch mortar rounds, and barrage rockets. From 1943 through 1945 nearly the entire Waikoloa Maneuver Area was in constant use, as the Marine infantry reviewed every phase of training from individual fighting to combat team exercises. Intensive live-fire training was conducted in grassy areas, cane fields, and around the cinder hills of Puʻu Pa and Puʻu Holoholoku. (2008:47)

The 2nd Marine Division was the first to train at Waikōloa, for five months, in preparation for the invasion of Saipan and Tinian. The 5th Marine Division replaced the 2nd Division in August 1944, and used the Waikōloa Maneuver Area to prepare for the assault on Iwo Jima. While training, the marines resided at a military camp established just outside of Waimea Town. Initially called Camp Waimea, the camp was later renamed Camp Tarawa in honor of the first successful invasion of the Pacific War. Camp Tarawa was the largest U.S. Marine training facility in the Pacific, covering an area of approximately 467 acres, and between 1943 and 1945 as many as 50,000 men passed through the camp on their way to the Pacific Theater (Escott 2008). According to Nees and Williams (2000), in addition to the 2nd and 5th Marine Divisions, the 31st Naval Construction Battalion, the 471st Army Amphibian Truck Company, the 726th Signal Aircraft Warning Company, the 11th Amphibian Tractor Battalion, the 5th Joint Assault Signal Company, and the 6th Marine War Dog Platoon also passed through Camp Tarawa.

The last of the Marines of the 5th Division departed Camp Tarwa in June of 1946, and the Waikōloa Maneuver Area, with the exception of the 9,141 acre Lālāmilo Firing Range, was returned to the Parker Ranch in September of 1946 (Haun et al. 2010). The Lālāmilo Firing Range, through a permit granted by the Territory of Hawai'i, was retained by the U.S. Marines as a training area and camp site until 1953 (Escott 2008). When the use permit was cancelled in December of that year, the lands once again reverted to leased cattle pasture administered by the Territory of Hawai'i. Clean-up of unexploded ordnance (UXO) within the Waikōloa Maneuver Area is still ongoing.

Use of the Project Area Lands during the Late Historic and Modern Periods (1954-present)

Following World War II, the lands of Waikōloa (in ca. 1946) and Lālāmilo (in ca. 1953) in the vicinity of the current project area were once again used as cattle pasture. Parker Ranch retained fee simple ownership of Waikōloa, but the lease of Lālāmilo reverted back to the Territory of Hawai'i, and then in 1959 to the State of Hawai'i, and was eventually assigned to Palekoki Ranch. The use of the project area lands for military training exercises during World War II opened new access routes to inland and coastal locations that were previously unavailable, but that could now be traveled by motorized vehicle (Maly 1999). The 1956 U.S.G.S. Puʻu Hīnai quadrangle (unlike the 1923 quadrangle; see Figure 25) shows the Puakō-Waimea trail extending inland from Puakō Bay through Waikōloa Ahupua'a to a north/south fork in the road (Figure 26); the northern fork, labeled Puakō-Waimea Trail, extends northeast into Lālāmilo Ahupua'a, passing the northwest of the current project area on its way to Waimea; the southern fork continues east into the uplands of Waikōloa Ahupua'a. It is likely that this road was built by the U. S. military during World War II to access lands within the Waikōloa Maneuver Area and then used as the road to Waimea once the Waikōloa lands were returned to Parker Ranch and the Territory of Hawai'i at the conclusion of the war.

Since the 1950s modern development, concentrated along the coast and around the Villages of Waimea and Waikōloa, has been slowly encroaching on the project area lands. In 1949-50 the coastal lands of Lālāmilo were divided into the Puakō Beach Lots and a nice road was built to Kawaihae, bringing many new residents to the area (Maly 1999). During the 1970s the current alignment of Queen Ka'ahumanu Highway (Highway 19), extending from Kailua to Kawaihae, was constructed across the coastal sections of the *ahupua'a*, Waikōloa Road was built to connect the new lower highway with the upper highway (Highway 190), and the Village of Waikōloa was established at inland elevations to the south of the project area. With the construction of the new highways and the shifting of residential patterns, the older coastal roads and *mauka*/*makai* travel routes largely fell into disuse (the Puakō-Waimea trail is not shown on the 1982 U.S.G.S. Puʻu Hīnai quadrangle).

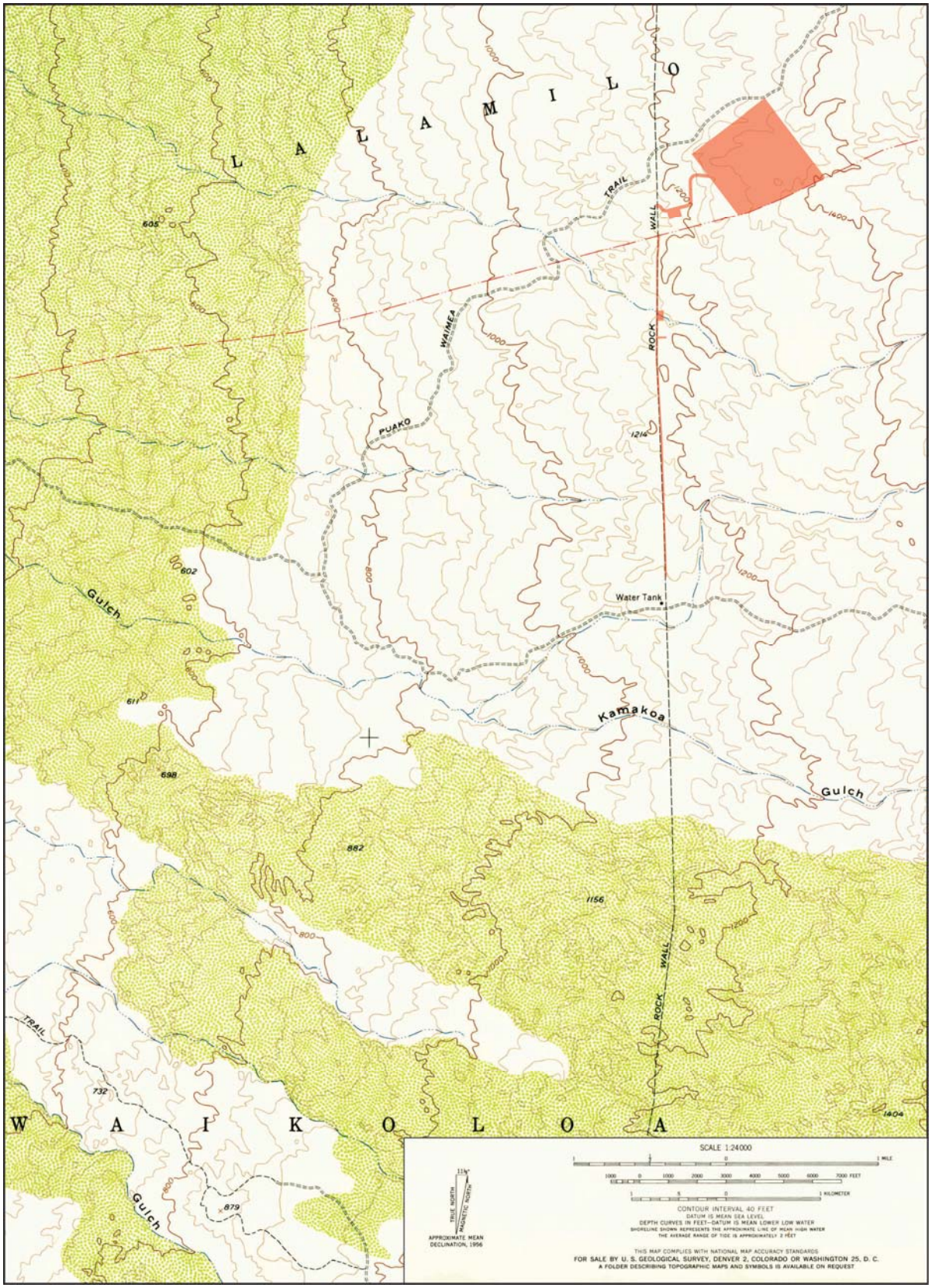

Figure 26. Portion of the 1956 U.S.G.S. Pu‘u Hinai quadrangle showing the current project area (outlined in red).

During the 1980s large resort properties were developed along the coast of Lālāmilo and neighboring lands. The resort developments required water, which necessitated the drilling of wells and the development of a modern water distribution system. Several wells were drilled in the vicinity of the current project area around this time (see Figure 3), and in 1985 the first Lālāmilo Wind Farm was erected as a power source for some of those wells. The wind farm (Figure 27), which was acquired by Hawaii Electric Light Company in 1987, continued to operate for almost twenty-five years, before being removed from the current project area in 2010.

Figure 27. October 17, 2009 aerial view (from Google Earth) of the first Lālāmilo Wind Farm.

PREVIOUS ARCHAEOLOGICAL STUDIES

There have been numerous archaeological studies conducted in the *ahupua'a* of Waikōloa and Lālāmilo in the vicinity of the current project area (Figure 28 and Table 1). Previous studies in these *ahupua'a* have largely concentrated on (1) the resort developments in the coastal areas of Lālāmilo and Waikōloa *ahupua'a*, (2) the intermediate zone of Waikōloa Ahupua'a between Queen Ka'ahumanu Highway and Waikōloa Village, and (3) the uplands of Lālāmilo Ahupua'a in the vicinity of Waimea Town. A few studies, mostly of small well sites and access corridors (Clark and Rechtman 2005; Rechtman 2003, 2005, 2008a, 2008b, 2008c; Rosendahl 1992a, 1992b) and of the route of the proposed Waimea-Kawaihae Road corridor (Barrera and Kelly 1974; Clark and Kirch 1983), have been conducted within the intermediate *pili* lands of Waikōloa and Lālāmilo *ahupua'a* at more proximate elevations to the current project area; three previous studies (Soehren 1984; Rosendahl 1992a, 1992b; Rechtman 2005) have included portions of the current project area.

Table 1. Previous archaeological-historical investigations in the vicinity of the current project area.

Year	*Author*	*Ahupua'a*	*Type of Study*	*Elevation**
1971	Ching	Waikōloa, Lālāmilo	Survey	140-200
1972	Rosendahl	Waikōloa, Lālāmilo	Salvage	142-200
1972	Bevacqua	Waikōloa	Survey	500-850
1974	Barrera and Kelly	Lālāmilo, Waikōloa	Reconnaissance Survey	10-2600
1978	Yent and Griffin	Lālāmilo	Reconnaissance	0-320
1979	Ching	Lālāmilo	Reconnaissance	2280-2480
1979	Kirch	Lālāmilo, Waikōloa, Kalāhuipua'a	Investigations	0-200
1981	Clark	Lālāmilo	Intensive Survey	2280-2480
1983	Clark and Kirch	Lālāmilo, Waikōloa	Investigations	10-2600
1984	Soehren	Lālāmilo	Reconnaissance	1280-1360
1987	Clark	Lālāmilo	Survey	2280-2480
1987	Kennedy	Waikōloa	Reconnaissance	200-490
1990	Burgett and Rosendahl	Lālāmilo	Inventory Survey	0-320
1991	Jensen and Burgett	Waikōloa	Inventory Survey	480-570
1991	Yent	Lālāmilo	Survey	0-320
1992a, b	Rosendahl	Waikōloa	Inventory Survey	1130-1240
1992	Shilz and Shun	Waikōloa	Inventory Survey	150-540
1992	Burgett et al.	Lālāmilo	Survey	
1992	Dunn and Rosendahl	Lālāmilo	Inventory Survey	
1993	Barrera	Lālāmilo	Inventory Survey	2440-2500
1994	Jensen	Lālāmilo	Inventory Survey	0-320
1994	Spear and Chaffee	Makapala to Lālāmilo	Inventory Survey	310-360
2000	Rosendahl	Waikōloa	Inventory Survey	100-190
2002	Moore et al.	Waikōloa	Inventory Survey	200-490
2003	Haun et al.	Lālāmilo	Inventory Survey	2100-2490
2003	Rechtman	Waikōloa	Assessment	1090-1160
2004	Sinoto and Dashiell	Waikōloa	Inventory Survey	550-1200
2005	Clark and Rechtman	Waikōloa	Inventory Survey	1150-1200
2005	Rechtman	Waikōloa	Survey	1130-1240
2006	Rechtman	Waikōloa	Survey	1260-1320
2008a	Rechtman	Lālāmilo	Survey	1180-1240
2008b	Rechtman	Waikōloa	Survey	1260-1320
2008c	Rechtman	Waikōloa	Survey	1200-1270
2010	Rieth and Morrison	Kawaihae, 'Ōuli, Lālāmilo, Waikōloa	Inventory Survey	0-2460
2011	Clark and Rechtman	Waikōloa	Inventory Survey	170-540
2014	Clark et at.	Waikōloa	Inventory Survey	200-530

Feet above mean annual sea level

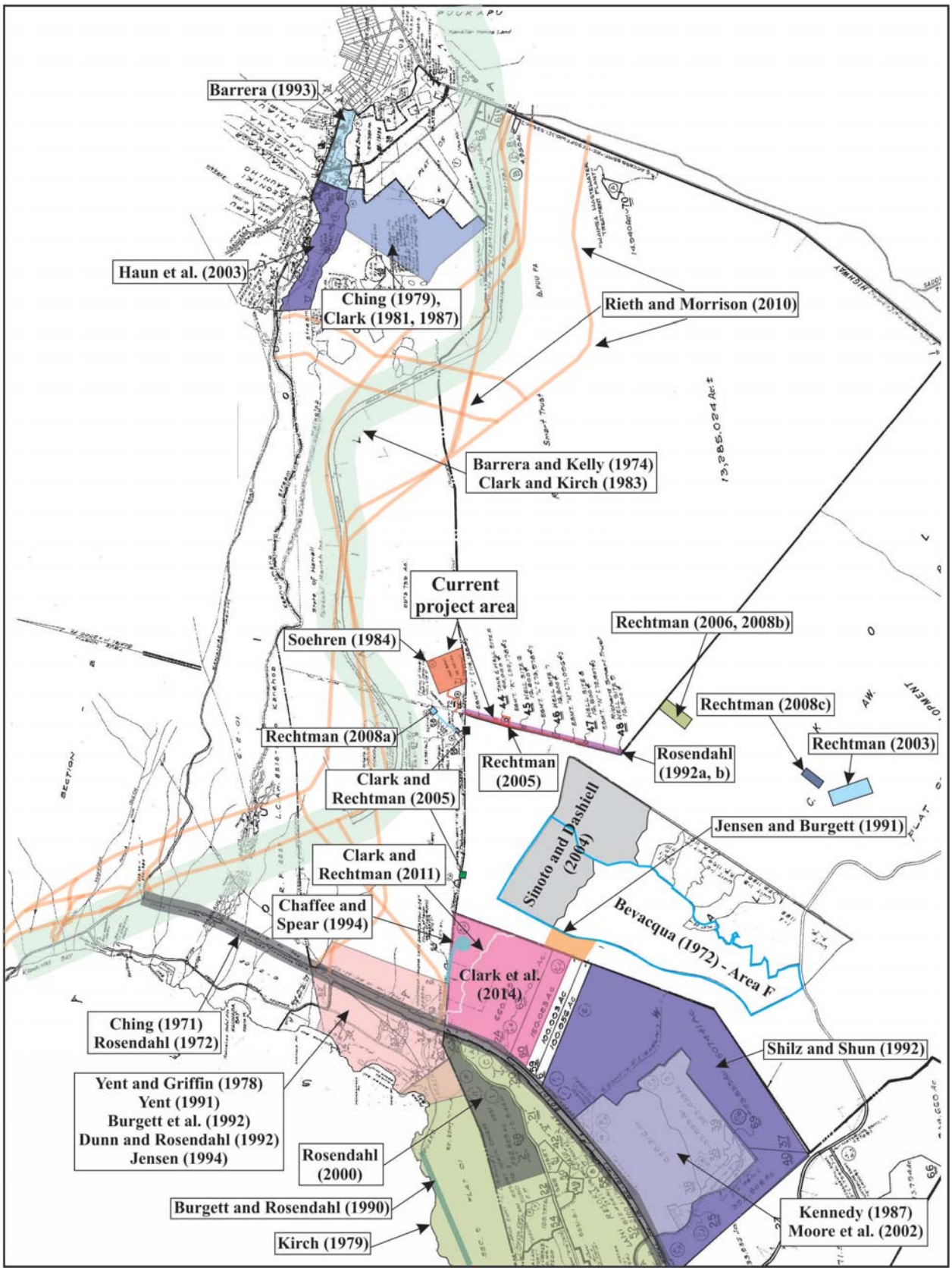

Figure 28. Previous archaeological studies conducted in the vicinity of the current project area.

Archaeological Studies of the Coastal Areas of Lālāmilo and Waikōloa Ahupua‘a

Collectively, investigations conducted in the coastal portions of Lālāmilo and Waikōloa *ahupua‘a* (Burgett and Rosendahl 1990; Ching 1971; Jensen 1994; Kirch 1979; Rosendahl 1972; 2000; Yent 1991; Yent and Griffin 1978) have identified a wide range of Precontact and Historic archaeological site types including caves (lava tubes), petroglyphs, cairns, trails, rock and cave shelters, refuge caves, burial caves, burial monuments, a *hōlua* slide, and a large number of features associated with both temporary and permanent habitation such as house platforms, overhangs, terraces, modified outcrops, paved areas, U-shape enclosures, sinkholes, walls, and rubble excavation areas. Coastal and inland (*mauka*/*makai*) trail networks have also been documented during these studies. The trails were used for coastal travel between *ahupua‘a*, and also for commodities exchange between the coastal areas and the upland agricultural fields and resource areas.

In 1979, the B. P. Bishop Museum published a report entitled *Marine Exploitation in Prehistoric Hawai‘i* (Kirch 1979) that presented the findings of several phases of archaeological investigation within a roughly 3,841 acre area between Queen Ka‘ahumanu Highway and the coast, within the *ahupua‘a* of Waikōloa, Lālāmilo, and Kalāhuipua‘a (see Figure 28). Four hundred and forty-nine archaeological features were identified within the study area including petroglyphs, fish ponds, trails, C-shaped structures, U-shaped structures, L-shaped structures, shelter caves, burial caves, storage caves, modified sinks, abrader manufacturing areas, *papamū*, walls, circular structures, enclosures, platforms, midden deposits, paved areas, pits, cairns, and a Historic cemetery (Kirch 1979). More than half of the identified features were situated near the ocean within the land divisions of Lālāmilo and Kalāhuipua‘a, and were associated with Precontact coastal habitation and resource procurement. The remaining features (n=207) were situated at more inland elevations within Waikōloa Ahupua‘a, which does not extend to the coast, but were also primarily associated with coastal habitation and resource procurement. Only a few features, consisting of crude constructions related primarily to short-term habitation an *mauka/makai* travel, were reported near Queen Ka‘ahumanu Highway at the north end of the area along the Waikōloa/Lālāmilo boundary (Kirch 1979).

Burgett and Rosendahl (1990) conducted an archaeological inventory survey of a 1,000 foot long by 100 foot wide corridor for the proposed location of the Puako Road Extension Corridor near the coast in Lālāmilo Ahupua‘a within the Kirch (1979) study area (see Figure 28). The primary focus of the survey was to identify the presence and/or absence of any highly significant archaeological sites and features that might prevent the development of the proposed roadway and waterline. As a result of the archaeological investigations performed by Burgett and Rosendahl (1990), twenty-four sites (SIHP Sites 14513 to 14536) containing fifty-one features of various function and integrity were identified within or immediately adjacent to the corridor. All of the documented sites, with the exception of a single petroglyph panel and a *pāhoehoe* excavation/wall of indeterminate function, were deemed to be associated with habitation/temporary habitation. Many of the habitation site complexes that were encountered were comprised of features such as caves, cairns, petroglyphs, terraces, overhangs, pavings, and in one case, a walled sink.

Rosendahl (2000) later conducted an archaeological inventory survey of a roughly 450-acre portion of the Kirch (1979) study area (TMK: (3) 6-8-01:022) located in Waikōloa Ahupua‘a along the Lālāmilo boundary at elevations ranging from 30 to 230 feet above sea level (see Figure 28). Rosendahl identified thirty archaeological features that he grouped into fourteen sites (SIHP Sites 21974-21987). Most of the identified sites were situated at the northeastern end of the study area nearest to Queen Ka‘ahumanu Highway and Puakō Bay. Twenty-one of the recorded features dated to the Historic Period and nine were interpreted as Precontact Period constructions. Most of the Historic Period features, including a network of corrals formed by metal poles, wooden cattle feeders and wooden stanchions, a water pumping facility and a concrete flume, two concrete slabs, a cattle loading chute, a large, bermed enclosure, three collapsed wooden structures, a trash pile, and two metal boxes, were assigned to a single Historic/Modern ranch complex. The remaining Historic Period features were recorded as single feature sites, including three core-filled walls, four stone clearing mounds, and a cart path. The cart path consisted of two parallel alignments of cobbles with a leveled surface between extending in an ENE/WSW direction parallel to the Waikōloa/Lālāmilo boundary. Rosendahl (2000) indicates that this cart path appeared to have provided access from Puakō Bay to an undetermined *mauka* location. The Precontact Period sites recorded by Rosendahl (2000) included three overhang shelters, an enclosure and C-shape, an isolated enclosure (SIHP Site 21980), two surface midden scatters, and a modified outcrop.

Along the eastern edge of the Kirch (1979) and Rosendahl (2000) study areas, Ching (1971) and Rosendahl (1972) examined a corridor for the construction of a Kailua-Kawaihae road corridor (Queen Ka‘ahumanu Highway) between Lālāmilo Ahupua‘a and Hamanamana Ahupua‘a (in the district of North Kona; see Figure 28). Ching (1971) conducted a surface survey of the entire corridor, which was followed by archaeological salvage excavations at selected locations within the final alignment of highway conducted by Rosendahl (1972). Within the Waikōloa and Lālāmilo portions of the road corridor Ching (1971) and Rosendahl (1972) identified numerous, diverse archaeological

feature types, including C-shapes, U-shapes, L-shapes, linear shelters, rectangular shelters, cave shelters, dwelling caves, enclosures, mounds, fire pits, petroglyphs, hunting blinds, *ahu* (cairn), trails, terraces, walls, platforms, and areas of surface midden that were interpreted as having been used for habitation, agriculture, burial, transportation, and recreational purposes during the both the Precontact and Historic Periods. These features were briefly described by Ching (1971) and placed on a map of the overall survey area. Rosendahl's (1972) study focused primarily on defining the nature of the Precontact residential occupation within the corridor and the interrelationship of the features and the various resource zones. Rosendahl suggests that the primary focus of Precontact occupation within the corridor (and by association the barren inland zone) involved the use of temporary shelters by people travelling between the coastal and upland zones, the temporary and extended use of residential sites by people engaged in the collection of coastal resources, and the storage of gear for recurrently used and possessions. Limited dating of materials recovered from the sites suggested primary use from ca. A.D. 1500 through the Historic Period.

North of the Kirch (1979) and Rosendahl (2000) project areas, the Ching (1971) and Rosendahl (1972) survey corridor extends through a 750-acre parcel in coastal Lālāmilo Ahupua'a that was the subject of a phased archaeological study (Burgett et al. 1992; Dunn and Rosendahl 1992; Jensen 1994) conducted by Paul H. Rosendahl, Inc. (PHRI) for the expansion of the Hapuna Beach State Recreation Area (see Figure 8). This area was the subject of previous archaeological investigations conducted by Yent and Griffin (1978), and Yent (1991). The PHRI project was undertaken in three phases beginning with Phase I – survey and initial site identification (Burgett et al. 1992), followed by Phase II – completion of inventory-level fieldwork at sites that required additional evaluation and documentation (Dunn and Rosendahl 1992), and culminating in Phase III – analysis of all recovered cultural materials, including site and feature distributions, as well as description and analysis of recovered cultural material and ecofactual remains (Jensen 1994).

Within the project area, as a result of these studies, 164 sites containing 425 features were identified. The identified feature types included C-shaped, U-shaped, D-shaped and L-shaped alignments, cairns, walls, cleared areas, enclosures, depressions, foundations, hearths, midden scatters, modified outcrops, mounds, overhangs, parallel walls, paved areas, pylons, ramps, remnant terraces, rubble concentrations, trails, and upright stones. Jensen (1994) proposes a range of functional interpretations for these formal feature types, including agriculture, fence line, habitation, hunting blind, indeterminate, marker, military, park maintenance, possible agriculture, possible ceremonial, possible marker, possible military, possible post support, possible temporary habitation, recreation, temporary habitation, trail marker, transportation, and water transportation. In some cases more than one functional interpretation was assigned to a single feature. The predominant functional activities represented by these collective features was temporary habitation, agriculture, habitation, and transportation. Habitation sites were clustered near the shore at Hapuna Bay within the project area, but temporary habitation and agricultural, and by association trail sites, extended into the area *mauka* of Queen Ka'ahumanu Highway along the Waikōloa/Lālāmilo boundary. Jensen relates that, "clearly, exploitation of the area's marine resources, coupled with agricultural activity within gulch areas, while operating from both permanently occupied feature complexes as well as temporarily occupied sites, represent important activities for Native Hawaiian occupants of the region," he notes however, "that a variety of non-subsistence-related, non-indigenous, post-1940's activities are also represented among the project area's cultural resource base" (1994:23).

Archaeological Studies of the Intermediate Zone of Waikōloa Ahupua'a between Queen Ka'ahumanu Highway and Waikōloa Village

Extensive archaeological survey of the intermediate zone of Waikōloa Ahupua'a between Queen Ka'ahumanu Highway and Waikōloa Village has occurred. Previous studies conducted in this area have generally included large land areas that contain few archaeological sites (Bevacqua 1972; Chaffee and Spear 1994; Clark and Rechtman 2011; Clark et al. 2014; Kennedy 1987; Moore et al. 2002; Schilz and Shun 1992; Sinoto and Dashiell 2004). The findings of the previous studies agree that the dry, intermediate inland areas of Waikōloa *ahupua'a* were not extensively utilized during Precontact times for habitation related purposes, but were an area where small scale resource procurement was conducted on a limited basis.

Kennedy (1987) conducted an archaeological reconnaissance survey of TMKs: (3) 6-8-001:036, 038, and 039, encompassing roughly 1,000 acres within Waikōloa Ahupua'a that extend inland from Queen Ka'ahumanu Highway (see Figure 28). As a result of the Kennedy study only one site, consisting of a shallow rock shelter, an *ahu*, and a low wall, was identified. Kennedy (1987) noted the presence of a single *'opihi* shell at the site and modern debris, but given the reconnaissance nature of the survey, did not investigate further. Moore et al. (2002) later conducted an archaeological inventory survey of this same project area (see Figure 28), identifying ten archaeological sites containing a total of thirteen features (SIHP Sites 22509-22518). The recorded sites included the rock shelter previously recorded by Kennedy (1987), seven C-shaped walls with associated *ahu*, four independent *ahu* (three of

which were grouped together), and a stone covered hearth. With the exception of the individual *ahu*, which were interpreted as demarcating Historic pasturelands, the recorded sites were thought to have been "utilized for temporary habitation during the pre-Contact Period with the utilization of some sites potentially extending into the early post-Contact Period" (Moore et al. 2002:i). A radiocarbon sample obtained from the rock shelter previously recorded by Kennedy (1987) returned a date of A.D. 1480 for initial utilization of the site.

Schilz and Shun (1992) conducted an archaeological survey and evaluation of approximately 3,000 acres extending inland from Queen Kaʻahumanu Highway in Waikōloa Ahupuaʻa (TMKs: (3) 6-8-01:025, and 036 to 042) that encompassed the area earlier surveyed by Kennedy (1987) and later by More et al. (2002) (see Figure 28). The 1,000 acre area previously surveyed during by Kennedy (1987) was not re-examined, but within the 2,000 acre area surrounding it Schilz and Shun (1992) identified only a single archaeological site consisting of a lava tube containing human skeletal remains (SIHP Site 15033). Besides this site, Schilz and Shun (1992) noted twelve additional features in the overall survey area (cairns, wall shelters, rock mounds, and C-shapes) that were interpreted as modern and were not assigned SIHP site numbers. Regarding the C-shapes, of which they found four, Schilz and Shun noted that the rough enclosures appeared to be "hunters' blinds with no deposits of any kind" (1992:21).

To the north of the Shilz and Shun (1992) study area Clark et al. (2014) conducted an archaeological inventory survey of roughly 810 acre area (TMKs: (3) 6-8-01:024 and 060) in Waikōloa Ahupuaʻa that extends inland from Queen Kaʻahumanu Highway along the Lālāmilo boundary (see Figure 28). Archaeological inventory surveys of two corridors across this property had previously been conducted by Chaffee and Spear (1994) and Clark and Rechtman (2011). Chaffee and Spear (1994) identified two archaeological sites (SIHP Sites 19777 and 19778) within the Clark et al. (2014) study area, both surface scatters of shell midden. The shell scatters were interpreted as rest stops (Precontact temporary habitation areas) utilized by travelers along a trail route that once followed the Lālāmilo/Waikōloa boundary between the coastal settlement zone and the inland agricultural zone. No trial route or surface architecture was identified near either site, and a shovel probe excavated at Site 19777 revealed the absence of any subsurface cultural deposit. The marine shell fragments from the surface of both sites were collected. Clark and Rechtman (2011) identified five archaeological sites (SIHP Sites 28682 to 28686) within the Clark et al. survey area. The recorded sites included a portion of the old Puakō Sugar Plantation's wooden flume from Waikōloa Stream, two rock piles that seemed to mark the former route of a World War II-era communications line, a Historic dike constructed for flood-control purposes, a circular enclosure containing a rock pile that may have been a Historic hunting blind or skeet shooting area, and a C-shaped enclosure that may have been the location of a Precontact shelter. All of these previously recorded sites, along with a portion of Site 21976, a Historic cart path, previously recorded by Rosendahl (2000), were incorporated into the findings of the Clark et al. (2014) study.

Three of the sites recorded Clark and Rechtman (2011) – Sites 28682, 28683, and 28684, the old Puakō flume, the World War II-era communications line, and a Historic dike/ditch complex – were expanded by Clark et al. (2014) to include additional features newly identified within the larger project area. Site 21976, originally recorded by Rosendahl (2000) as a Historic cart road, was reinterpreted as a bulldozed roadway created during the early to mid-twentieth century. Sites newly identified by Clark et al. (2014) (Sites 30071 to 30083) included two C-shaped enclosures interpreted as Precontact Period shelters, three Precontact Period habitation complexes, two modified outcrops interpreted as Precontact Period shelters, a rock pile and modified outcrop that appear to have functioned as a Historic survey station, a short wall interpreted as a Precontact Period shelter, a surface scatter of marine shell, a rock pile with an associated trail segment that may have been a rest area along an old trail route, a complex of features used for Historic Period habitation and agricultural purposes, and a complex of eighty-nine twentieth century hunting blinds built by bird hunters. The Precontact Period sites, mostly indicative of short-term or recurrent habitation, were concentrated in the northern portion of the project area near the Lālāmilo boundary. Clark et al. (2014) suggest, like Chaffee and Spear (1994) before them, the presence of these site types in that area is evidence of the route of an old trail that once extended along *ahupuaʻa* boundary.

East of the Clark et al. (2014) study area in Waikōloa Ahupuaʻa, Jensen and Burgett (1991) conducted an archaeological inventory survey of an approximately 80 acre portion of TMK: (3) 6-8-002:019 (see Figure 28). As a result of that survey, five archaeological sites (SIHP Sites 15066-15070), containing a total of twenty-two features, were recorded. The features included three boulder alignments (possible check dams) within a gulch, terraces on the northwestern bank of the gulch, a wall, and seventeen hunting blinds. Jensen and Burgett (1991) interpreted the boulder alignments and terraces within the drainage channel as potential Precontact Period features, suggesting that intermittent water flow may have been channeled and stored to provide water for agricultural pursuits along the gulch edges. The low wall, which extended along a meandering course across a flat area between two knolls, was described as being similar to a wall excavated by Rosendahl (1972) in the lower portion of Waikōloa Ahupuaʻa, and was also

interpreted as having a possible agricultural function. The seventeen hunting blinds consisted of crudely constructed stacked stone structures that were interpreted as modern features.

Bevacqua (1972) conducted an archaeological survey of portions of Waikōloa Ahupua'a in order to determine the nature and distributions of archaeological sites within areas that were slated for development at that time. Seven large areas dispersed throughout the *ahupua'a* were examined (Areas A-G), the most proximate being Area F, located to the east of the Jensen and Burgett (1991) study area within the Waikōloa Village development area (see Figure 28). Bevacqua (1972) recorded total of twenty-two sites within the seven survey areas. Five sites (Sites 17-21) were identified in Area F including a circular stone enclosure, an isolated C-shaped shelter, two cairns, and a complex consisting of four C-shaped shelters, a rectangular enclosure, four walls, and a cairn. Sinoto and Dashiell (2004) conducted an archaeological inventory survey of TMK: (3) 6-8-02:022 encompassing roughly 860 acres within the Waikōloa Village development area (see Figure 28), a portion of which was previously surveyed by Bevacqua (1972). Sinoto and Dashiell (2004) reported no archaeological findings as a result of their study.

Archaeological Studies of the Intermediate Zone of Waikōloa and Lālāmilo Ahupua'a in the Vicinity of the Current Project Area

Previous archeological studies conducted within the intermediate *pili* lands of Waikōloa and Lālāmilo *ahupua'a* at proximate elevations to the current project area (see Figure 28) have typically included small well parcels and access corridors (Clark and Rechtman 2005; Rechtman 2003, 2005, 2008a, 2008b, 2008c; Rosendahl 1992a, 1992b). The two notable exceptions are the proposed Waimea-Kawaihae Road corridor that passes to the north of the current project area through the center of Lālāmilo Ahupua'a, extending from the coast in the *ahupua'a* of Kawaihae to the Town of Waimea; this corridor has been subject to extensive archaeological study (Barrera and Kelly 1974; Clark and Kirch 1983); and the more recent study of the Kawaihae Road Bypass Corridors (Rieth and Morrison 2010). Three previous archaeological studies, one of the old Lālāmilo Wind Farm (Soehren 1984) and two of the Parker wells (Rosendahl 1992a, 1992b; Rechtman 2005) have included portions of the current project area. Although few in number, the most common feature types reported at proximate elevations to the current project area are C-shaped shelters and cairns, along with Historic military and ranching features.

Within the current project area Soehren (1984) conducted an archaeological reconnaissance survey of an approximately 80 acre area (Lot A of the Lālāmilo survey area) for the construction of the first Lālāmilo Wind Farm (see Figure 28). In northwestern corner the survey area Soehren (1984) identified evidence of World War II era and possibly nineteenth century ranching use, in the form of surface debris and a stacked stone alignment; to the east of this he noted the presence of a cairn and an associated marine shell scatter; and to the west he mentioned a stone wall cattle fence that was to be breached by the wind farm access road. The reconnaissance report prepared by Soehren, which did not include a feature location map, is reproduced in its entirety below:

> The area examined contains approximately 80 acres and lies between 1280 and 1360 feet above sea level, 4.5 miles inland from Puako Bay along the southern boundary of Lalamilo. The new Waimea-Kawaihae highway will pass about one-half mile to the north. This region is in the Vegetation Zone IV as described by McEldowney, (1983:410): "mixed grass and shrub communities (10 to 90 cm.) containing naturalized introduced species and some native shrubs adapted to grazing…" In aboriginal times, before cattle were introduced, these lands were marginal to the Hawaiian economy, serving primarily as a reservoir of natural products such as pili grass and birds.
>
> Evidence of human presence at the site is accordingly scarce. The presence of military personnel, presumably during World War II, is indicated by a few weathered boards, rusted food cans and field telephone wire on a prominent knoll at the western edge of the site. Some field stones have been roughly stacked into an alignment one fathom long, two stones high. The knoll is located at the northwestern end of line "A" and is identified by the spot elevation 1308.0 on the topographic map of the site. A scattering of broken cowry shells on the eastern slope of the knoll probably derived from the "field rations" of native Hawaiian cowboys during the nineteenth century. The knoll commands a good view in all directions and would be ideal when watching or searching for cattle.
>
> A similar scattering of broken cowry shells was found about 500 feet east on another slight knoll, identified by the spot elevation 1326.5 and windmill site B13. On top of the knoll is a roughly made stone cairn about three feet in diameter and 1.5 feet high.
>
> No other archaeological or historic features were observed in the project area and those found warrant no further consideration.

> Access to the wind farm site is proposed along an existing ranch jeep trail which roughly parallels the wire fence marking the boundary between Lalamilo and Waikoloa. A cattle guard will probably be installed where the road crosses the stone wall cattle fence at about 1150 feet elevation. This well-maintained fence is a prominent landmark which extends for several miles north-south across the lands of Ouli, Lalamilo and much of Waikoloa.
>
> While it might be regarded as an historic feature, an additional breach should not adversely affect its significance. The access road was not examined during this survey but it is unlikely to contain undisturbed archaeological features of significance. (Soehren 1984:1-2)

Rosendahl (1992a) conducted an archaeological inventory survey of a roughly 2,800 meter long by 40 meter wide corridor across a portion of TMK: (3) 6-8-01:001 (see Figure 28) that included Easements J, K, L, and M of the current Waikōloa survey area (where Parker wells No. 1, 2, 3, and 4 are currently located). Rosendahl, indicating that the "area had been extensively disturbed historically", did not identify any significant cultural resources within the corridor, although he did note the presence of a cattle wall along with "bulldozer berms, and recent trash" (Rosendahl 1992a:5). Don Hibbard of DLNR-SHPD, citing an earlier correspondence that indicated that the proposed wells were "adjacent to a long historic boundary wall (Site No. 9012) that divides Waikoloa and has been determined to be significant under criterion 'a' or for its association with events important to broad patterns in Hawaii's history" (Hibbard Letter dated July 1, 1991 on file at SHPD), did not concur with Rosendahl's findings. In response to the letter, Rosendahl (1992b) conducted additional historical research on the well sites, and as a result construction was allowed to proceed on two of the proposed well (Parker wells No. 1 and 2) and the paved roadway along the *mauka* edge of the Site 9012 wall (Hibbard Letter dated August 26, 1994 on file at SHPD).

Rechtman (2005) later inspected an area within the Rosendahl (1992a) survey corridor for the proposed development of Parker well No. 3 and the stub road leading to it (part of Easement J of the current Waikōloa survey area). Rechtman (2005) also reporting no findings, and requested that DLNR-SHPD issue a written determination of "no historic properties affected" for the well site. Several other archaeological studies conducted at well sites near the current project area (Rechtman 2003, 2005, 2008a, 2008b, and 2008c; see Figure 28) have also reported no findings. At the most proximate of these well sites (Lālāmilo Well E), however, Rechtman indicates that:

> . . . three small enclosures were noted outside the corridor near the existing Well D. Based on the presence of broken glass, bullets and bullet shell casings, the enclosures appear to be U.S. Military WW II era training related features. All three features are located along the upper edge of a south facing slope, spaced four to fifteen meters west (outside) of the survey area. They were likely constructed by U.S. marines in the 1940s as defensive positions during training exercises. (2008a:3)

Clark and Rechtman (2005) conducted an archaeological inventory survey of two locations (4.4 acres) for the construction of two water tanks situated within Waikōloa Ahupua'a along the boundary with Lālāmilo Ahupua'a (see Figure 28). Both of the survey areas, one at 610 feet above sea level and another at 1,103 feet above sea level, were situated on TMK: (3) 6-8-02:019 to the west of the current project area. As a result of the study, a single archaeological site (SIHP Site 24396), consisting of two features, was recorded at the proposed location of the lower water tank. Site 24396 consisted of a C-shaped enclosure (Feature A) and a small rock pile (Feature B) situated approximately fifty-five meters apart on gently west sloping, grassy terrain. Subsurface testing at Feature A revealed no cultural material. Based on the formal attributes of the C-shape, Clark and Rechtman (2005) suggest that it may have functioned as a Precontact temporary habitation feature constructed by individuals utilizing the local resources or simply passing through the area on a trail. Feature B was interpreted as a cairn that may have marked a former boundary or trail route. Several metal fragments (shrapnel) and a number of cartridge casings left by U.S. soldiers who used the area for training maneuvers during World War II were also noted on ground surface in the vicinity of Site 24396.

The Mudlane-Waimea-Kawaihae Road Corridor, which passes to the east of the current project area, was the subject of an archaeological survey conducted by Barrera and Kelly (1974), subsequent feature excavations and historic studies conducted by Clark and Kirch (1983) (see Figure 28). As result of the Barrera and Kelly (1974) fieldwork 4,561 archaeological features were identified, with the majority situated along the coastal margin of Kawaihae and in the uplands of Lālāmilo. Archaeological investigations in Section 2 of the proposed road, a roughly 600 meter wide corridor extending from an elevation of 145 meters above sea level in 'Ōuli Ahupua'a to 620 meters above sea level in Lālāmilo Ahupua'a and passing the current project area to the north, revealed the presence of sixty-four sites containing 381 features (Clark and Kirch 1983:138-179). Three main categories of features were identified at these sites including cairns, shelters, and alignments. Clark and Kirch (1983) indicate that the majority of structures in Section 2 appeared to have been built as defensive positions and wind shelters during World War II. Only a very few sites were located in the middle zone of Section 2 at elevations proximate to the current project area; subsurface

testing of features within this zone revealed that all were likely of modern or military origins. Except for one rock wall at 1,200 feet above sea level (SIHP Site 9012), none of the archaeological features were still in use. Survey of areas outside of the road corridor indicated that Hawaiian occupation of the middle zone may have been limited to the banks of Waikoloa Stream and along Waiʻulaʻula Gulch. Most of the features in Section 2 were concentrated in the upland zone nearest the more agriculturally productive soils. Radiocarbon dates indicated that Hawaiian use of the upland area may have begun as early as A.D. 1600 and lasted until ca. 1800-1850.

Rieth and Morrison (2010) conducted an archaeological inventory survey of a roughly 1,548 acre area of potential road corridors extending from Māmalahoa Highway near Waimea Town to Highways 19 and 270, traversing Waikōloa, Lālāmilo, ʻŌuli, and Kawaihae *ahupuaʻa* (see Figure 28). In the general vicinity (at the same elevation) of the current study area they identified nine sites, eight of which were described as single mounds of undetermined age and function and the ninth was the prominent stone wall (Site 9012) that extends north/south through the greater area. Like the earlier Clark and Kirch (1983) study, Rieth and Morrison (2010) indicated that the mid-elevation area of Lālāmilo has a relatively low density of archaeological resources.

Archaeological Studies of the Uplands of Lālāmilo Ahupuaʻa in the Vicinity of Waimea Town

In the uplands of Lālāmilo Ahupuaʻa near the Town of Waimea at elevations ranging from roughly 750 and 900 meters (2,460 to 2,950 feet) above sea level previously conducted archaeological studies (Barrera 1993; Barrera and Kelly 1974; Ching 1979; Clark 1981, 1987; Clark and Kirch 1983; Haun et al. 2003, 2010) have documented an agricultural complex with an extensive network of fields (SIHP Sites 9178) fed by a system of irrigation ditches (SIHP Site 9179) running from the Waikoloa and Kahakohau Streams. The field complex is characterized by spatially limited residential sites, linear, low earthen ridges, and irrigation ditches located along (Waikoloa Stream) at the eastern margins of the system. Here more fertile soil and increased rainfall allowed for the extensive cultivation of sweet potatoes and irrigated taro (Kirch 1985). Kirch surmises that the fields were perhaps intermittently irrigated, and that "simple furrows" were utilized to "direct water across the sloping field surfaces," as "the capacity of the ditches was insufficient to have kept all fields constantly watered, and some method of rotation must have been practiced" (1985:231). In addition to sweet potatoes and taro, crops cultivated within the upland field system included *wauke*, *mamaki*, plantains, bananas, sugarcane, coconuts, and *hala* (Haun et al. 2003). Although most of the archaeological studies of these fields have concentrated on the Lālāmilo section of the system, archaeological survey of the Mudlane-Waimea-Kawaihae Road Corridor by Barrera and Kelly (1974) and subsequent feature excavations and historic studies by Clark and Kirch (1983) demonstrate that the field system also extends into the uplands of Waikōloa Ahupuaʻa.

Ching (1979) conducted an archaeological reconnaissance survey of a 295 acre property for the proposed development of the Lālāmilo Agricultural Park, situated to the northeast of the current project area (see Figure 28). The property was also the subject of later archaeological investigations by Clark (1981 and 1987). As a result of the fieldwork conducted by Ching (1979) and Clark (1981, 1987), a total of 284 archaeological sites and 2,125 features were identified and recorded (SIHP Site 9178). The majority of features encountered during these investigations were agricultural in nature (n=1,739). Habitation (permanent and temporary) features were the next most prevalent, and twenty-seven burial features were also identified. Twenty eight of the features in the project area related to Historic period ranching activities. Barrera (1993) conducted an archaeological inventory survey of a 50 acre parcel located adjacent to the Ching 1979 and Clark (1981, 1987) study area (see Figure 28). As a result of the survey, Barrera (1993) recorded a single archaeological site containing thirty-three agricultural features.

Most recently, Haun et al. (2003) conducted an archaeological inventory survey of a roughly 266-acre Department of Hawaiian Home Lands (DHHL) parcel located to the northeast of the current project area in Lālāmilo Ahupua'a (see Figure 28). As a result of the survey, seventy-six archaeological sites containing 819 features were identified and recorded. The sites were interpreted as primarily Precontact in age, with only six possibly dating to the Historic Period. Formal feature types encountered during fieldwork included terraces, mounds, enclosures, field boundaries, stone walls, irrigation ditches, platforms, walled terraces, C-shapes, U-shapes, modified outcrops, surface hearths, L-shapes, cairns, pond fields, concrete piers, and a small amount of isolated objects (Haun et al. 2003). Terraces were the most predominant of the identified features, followed by mounds. Feature functions varied considerably, however, Haun et al. (2003) noted that features relating to agriculture were the most common in the project area, followed closely by features pertaining to permanent habitation. In addition, a total of eighteen burials were identified within the project area, seven of them present in an existing Historic cemetery. The remaining eleven burials were identified during subsurface excavations at features that were determined to have a high potential for yielding human remains. Further work was not recommended for seven of the sites encountered during the study, as they were deemed to have been adequately documented. However, Haun et al. (2003) suggest that data recovery might be an appropriate mitigation measure for the remainder of the sites, excluding the burials and a portion of an agricultural complex (Site 22632) which were recommended to be preserved in place.

3. PROJECT AREA EXPECTATIONS

Given the review of the previous archaeological research, historical documentary research, and settlement patterns for the South Kohala District presented above, a set of archaeological expectations for the current study area are offered. The location and the specific history of the project area land use, the results of the background research, and a review of archaeological work previously conducted in the general vicinity of the current study area, which is located in a dry intermediate zone of Lālāmilo and Waikōloa *ahupua'a* between the more intensively utilized coastal and upland resource/habitation areas, suggests that archaeological features will be related primarily to the collection of specific resources (such as *pili* grass and birds) and travel between the coastal and upland areas during the Precontact to early Historic Periods, and ranching and military use during the later Historic Period.

Based on radiocarbon results, Rosendahl (1972) has suggested that widespread use of the coastal lands in the vicinity of the project area may have occurred as early as ca. A.D. 1500 and Clark and Kirch (1983) have suggested that the upland areas were intensively utilized as early as A.D. 1600. Very little archaeological evidence for the initial use of the intermediate lands between these two areas has thus far been discovered, but an old trail from Puakō to Waimea is known to have followed the Waikōloa/Lālāmilo *ahupua'a* boundary. Previous archaeological studies conducted adjacent to this boundary have not documented physical evidence of the actual trail route, but Chaffee and Spear (1994) and Clark et al. (2014) have reported marine shell scatters and temporary habitation features near the *ahupua'a* boundary *makai* of the current project area that suggest its former presence. Temporary shelters typically take the form of small C-shaped enclosures used for overnight stays or for respite from the elements. Clark and Kirch (1983) who documented several potential shelters at proximate elevations the current project area within the Mudlane-Waimea-Kawaihae Road Corridor, indicate that subsurface testing revealed that all were of modern military origins and were likely built as defensive positions and wind shelters during World War II.

Soehren (1984), who conducted an archaeological reconnaissance survey of an approximately 80 acre parcel included in the current project area (Lot A of the Lālāmilo survey area), identified evidence of World War II era and possibly nineteenth century ranching use, in the form of surface debris and a stacked stone alignment in the northwestern corner of Lot A. He also noted the presence of a cairn and an associated marine shell scatter, and mentioned a stone wall cattle fence that was to be breached by the wind farm access road. Since the Soehren (1984) study, however, a large portion of the 80 acres has undergone mechanical disturbance for the construction of the first Lālāmilo Wind Farm. Rosendahl (1992a) conducted an archaeological inventory survey of Easements J, K, L, and M of the current Waikōloa survey area and noted the presence of the same cattle wall, but did not record any archaeological sites, indicating that the "area had been extensively disturbed historically" (Rosendahl 1992a:5). The area surveyed by Rosendahl (1992a) has since been developed with a paved road and Parker wells No. 1, 2, 3, and 4. The cattle wall noted by Soehren (1984) and Rosendahl (1992a, 1992b) was originally recorded by Welch (1983; in Clark and Kirch 1983) as SIHP Site 9012.

It is expected, given the results of previous archaeological studies conducted within the current project area, combined with the extent of previous development that has occurred, that archaeological sites will be few in number and, with the exception of the aforementioned rock wall (SIHP Site 9012), will be limited to the undisturbed portions of Lot A of the Lālāmilo survey area. Archaeological features in this area are expected to be related to the Historic military and possible ranching use of the general project lands (Soehren 1984), evidence of a former trail route or boundary markers could also be found in undisturbed areas next to the fence along the southern edge of Lot A adjacent to the Waikōloa Ahupua'a boundary. Easement J of the Lālāmilo survey area is known to have been nearly completely graded in the past and is not expected to contain archaeological features. Nor are any sites expected in the area previously surveyed by Roasendahl (1992a) along the *mauka* edge of the existing paved road within the Waikōloa survey area. The Site 9012 rock wall still functions as a cattle barrier and has been previously recommended for preservation by DLNR-SHPD; only a small portion of this wall, situated at the western end of Easement J of the Lālāmilo survey area where a gate was erected across the former Lālāmilo Wind Farm access road, is expected to be within the current project area.

4. FIELDWORK

Surface survey and site recording for Lālāmilo Wind Farm Repowering Project was conducted on March 19 and 20, 2014, by Ashton K. Dircks Ah Sam, B.A., Owen F. Moore, M.A., Genevieve L. Glennon, B.A., and Matthew R. Clark, B.A., under the direction of Robert B. Rechtman, Ph.D.

METHODS

Fieldwork included a visual inspection of the surface of the Lālāmilo and Waikōloa survey areas, and detailed site recordation. Within the Lālāmilo survey area fieldworkers walked northwest/southeast transects across Lot A (78.081 acres), beginning in the southeastern corner, spaced at twenty meter intervals; and along both edges of the existing access road within Easement J (1.957 acres) to a distance of 10 meters beyond the graded roadway. Within the Waikōloa survey area fieldworkers walked the eastern (*mauka*) edge of the existing paved roadway within Easements J, K, L, and M to a distance of ten meters spaced at five meter intervals. The entire study area was easily accessible, and the ground surface visibility was excellent. The survey area, the archaeological features, and any significant landforms were plotted on a scaled map of the project area using a Garmin HCx handheld GPS device (set to the UTM NAD 83 datum). Temporary site numbers were assigned to the encountered archaeological features in sequential order as they were recorded (T-1, T-2, T-3, etc.). Isolated or stand-alone features were assigned their own temporary site numbers, as were groups of features that appeared interrelated based on proximity, form, and presumed age. The features of multi-component temporary sites were assigned alphabetical feature designations (A, B, C, etc.). Each temporary site identified within the project area was marked with a metal site tag containing the temporary site number, the date the site was recorded, and the recorder's initials. After being cleared of vegetation the temporary sites and features were mapped in detail (using a measuring tape and compass), photographed (both with and without a meter stick and north arrow for scale and orientation), and described using standardized site record forms. No subsurface testing was conducted during the current study.

FINDINGS

As a result of the archaeological inventory survey of the Lālāmilo Wind Farm Repowering Project three Historic Period archaeological sites were identified and recorded (Table 2). The sites include a portion of a rock wall (SIHP Site 9012) that extends across the *ahupua'a* of Lālāmilo and Waikōloa, a complex of stone features with associated debris that indicates use as a World War II era military encampment (SIHP Site 30109), and a complex of five cairns marking the boundary between Lālāmilo and Waikōloa *ahupua'a* (SIHP Site 30110). Site 30109, which contains a surface scatter of marine shell and coral, may also have a possible earlier Precontact Period habitation component to it. Sites 30109 and 30110 are located within Lot A of the Lālāmilo survey area, Site 30109 is in the northwest corner and Site 30110 along the southeast boundary, and Site 9012 is present at the western end of Easement J of the Lālāmilo survey area (Figure 29). Site 9012 also extends along the western edge of Easements J, K, L, and M for the entire length of the Waikōloa survey area, but the wall is located *makai* of the existing paved road, and is not within the area examined for the current study. The *mauka* edge of the paved road within the Waikōloa survey area has been completely disturbed by bulldozing to a distance of more than six meters (20 feet), and no archaeological resources of any kind were observed (confirming the findings of the earlier studies conducted by Rosendahl 1992a and Rechtman 2005). Several fragments of marine shell were identified along the edges of the existing access road within the Easement J portion of the Lālāmilo survey area, but these fragments appear to be washing down the steep slope from Site 30109, which itself contains a fairly substantial surface scatter of marine shell.

Table 2. Archaeological sites recorded during the current inventory survey.

*SIHP #**	*Site Type*	*Site Function*	*Age*	*Features*
9012	Rock wall	Ranching	Historic	1
30109	Complex	World War II military encampment with a possible traditional Hawaiian temporary habitation component	Historic/ Precontact	10
30110	Cairn complex	Boundary marker	Historic	5

***SIHP site numbers are preceded by the state, island, and U.S.G.S. quad prefix 50-10-11.**

The three archaeological sites identified within the Lālāmilo Wind Farm Repowering Project Area (SIHP Sites 50-10-11-9012, 30109, and 30110) are described in detail below. Their locations relative to one another, the project area, parcel, and *ahupua'a* boundaries are shown in Figure 29.

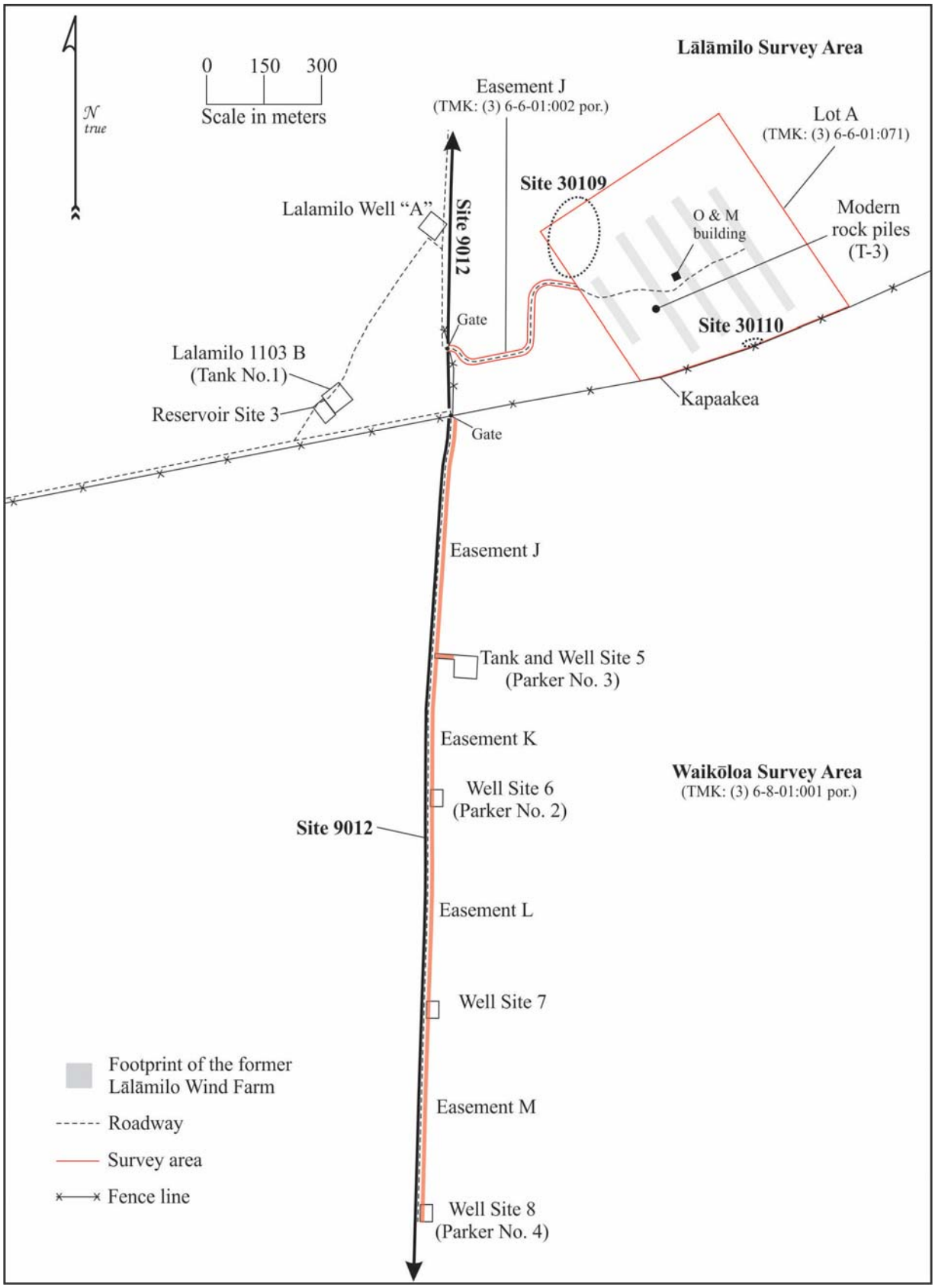

Figure 29. Project area plan view.

Site 30109 was first identified by Soehren (1984) as the World War II era debris, marine shell, and stacked stone alignment "located at the northwestern end of line 'A' and is identified by the spot elevation 1308.0" (1984:1). A scattering of marine shell and cairn described by Soehren as being "500 feet east [of Site 30109] on another slight knoll, identified by the spot elevation 1326.5 and windmill site B13" (1984:1), was not relocated and is presumed to have been destroyed during the construction of the original wind farm (the location described by Soehren has been bulldozed flat). Soehren (1984) did not identify Site 30110, nor did he mention two small rock piles located in the southwestern portion of Lot A, adjacent to a bulldozed swath of land where "Line B" of the former wind farm once stood. These two rock piles (recorded as Site T-3, but determined to be modern constructions, and therefore not assigned an SIHP site number), are spaced 20 meters apart from each other within an area that has been impacted by mechanical clearing (see Figure 29). The southern rock pile, constructed of roughly twelve small to large loosely piled cobbles, measures 1.6 meters by 1.2 meters by 32 to 41 centimeters tall (Figure 30). The northern rock pile, constructed of roughly ten small to large loosely piled cobbles, measures 1.5 meters by 1.2 meters by up to 50 centimeters tall (Figure 31). The rocks used in the construction of both of the rock piles exhibit signs of mechanical scarring, and the ground surface in their vicinity is littered with modern wind farm debris, indicating that both piles are likely modern constructions related to wind farm activities that were not present at the time of the Soehren (1984) study.

Figure 30. Southernmost of the two modern rock piles identified within Lot A of the Lālāmilo survey area, view to the north.

SIHP Site 9012

Site 9012 is a Historic Period rock wall that extends through the Lālāmilo survey area at the western end of Easement J (Figure 32). The wall also extends along the western edge of Easements J, K, L, and M for the entire 2.1 kilometer length of the Waikōloa survey area (see Figure 29), but is located *makai* of the existing paved road, and is not within the area examined for the current study (Figure 33). Site 9012, which was first assigned its SIHP designation by Welch (1983) as part of a larger study conducted by Clark and Kirch (1983), extends across both Lālāmilo and Waikōloa *ahupua'a* for several miles at elevations ranging from 1,100 to 1,200 feet above sea level, and is oriented roughly north/south. An approximately 15 meter long section of Site 9012, where a gate in the wall provides access to the existing road within Easement J of the Lālāmilo survey area, is present within the current project area. A gravel road follows the western edge of the wall, and a wire fence line crosses it within the project area (Figure 34). The sections of the wall, on either side of the gate, are mostly intact, but do exhibit some areas of collapse. At intact sections the wall averages 0.6 to 1 meters wide and has heights varying from 1 to 1.2 meters (Figure 35 and Figure 36).

Figure 31. Northernmost of the two modern rock piles identified within Lot A of the Lālāmilo survey area, view to the northwest.

Figure 32. SIHP Site 9012, wall extending across the easement J portion of the Lālāmilo survey area, view to the south.

Figure 33. SIHP Site 9012, wall along the *makai* edge of the existing road within Easement L of the Waikōloa survey area, view to the north.

Figure 34. SIHP Site 9012, wall within Easement J of the Lālāmilo survey area to the north, view to the north.

Figure 35. SIHP Site 9012, top surface of wall, view to the north.

Figure 36. SIHP Site 9012, intact western edge of the wall, view to the east.

A portion of Site 9012 located near the Lālāmilo/Waikōloa boundary was briefly described by Soehren (1984) (see the discussion of Previous Archaeolgical Studies presented above), and the section of wall adjacent to the Waikōloa Survey Area was previously examined by Rosendahl (1992a, 1992b) and Rechtman (2005), who indicate that Site 9012 was built by Parker Ranch during the late nineteenth or early twentieth century for cattle ranching purposes; to the north of the current project area portions of the wall have also been previously documented by Welch (1983) in Clark and Kirch (1983) and Rieth and Morrison (2010). Site 9012 is depicted on maps of Waikōloa and Lālāmilo prepared subsequent to 1917 (see Figures. 22, 24, 25, and 26), indicating that the wall was certialy built prior to the 1920s. Site 9012 is still maintained for cattle ranching purposes, and although collapsed in some areas and repaired with wire fence, the wall continues to restrict the *mauka*/*makai* movement of cattle across the study *ahupua'a*.

SIHP Site 30109

Site 30109 is a World War II military encampment consisting of ten features (Features A-J) located in the northwest corner of the wind farm survey area, north of the access road (see Figure 29). The site measures roughly 150 meters long by 100 meters wide and the features are situated on two ridges and within a crescent shaped basin. The ground surface at Site 30109 is comprised of mostly exposed soil with scattered cobbles and a few areas of exposed bedrock. The features at the site consist of an L-shaped alignment (Feature A), a rectangular-shaped cobble collection (Feature B), two C-shaped alignments (Features C and D), a filled-pit (Feature E), a cleared-level surface (Feature F), a collapsed wall segment (Feature G), a modified ridge top (Feature H), a small rock pile (Feature I), and a marine shell scatter (Feature I). Five of these features (Features A-E) are situated in a depression, blocked from the prevailing northeast trade winds and out of site when viewed from the east by a crescent-shaped ridge that has Features F-I on it. A second ridge to the north of the first (on the opposite side of a natural drainage) has a water-worn cobble on it with a nearby marine shell scatter (Feature J). On this second ridge, there are no associated features except rock piles marking the north boundary of Lot A. The site area is scattered with marine shell and rusted metal cans (C-ration-type of ration issued to combat soldiers during WW II from 1938 until 1958) along with communication field-wire extending in a northeast/southwest direction along the north edge of Feature H that continues to nearby Features A and G. Marine shell fragments are scattered across the surface of Site 30109 along with a coral fragments, water-worn cobbles, and a single volcanic glass flake, which could indicate an earlier Precontact component at the site as well. Detailed descriptions of Features A-J of Site 30109 follow below, and the locations of the features relative to one another and the boundary of Lot A are shown in Figure 37.

Feature A

Feature A is an L-shaped alignment located in the central portion of Site 30109, approximately 12 meters northwest of Feature C and 7 meters east of Feature B (see Figure 37). It is situated at the base of a southwest facing ridge. Feature A measures 6.5 meters long by 4 meters wide and is constructed of loosely piled small and medium cobbles and a single bedrock boulder on a soil cut in the slope. The alignment wall averages 1.1 meters in width and has upslope heights ranging from 7 to 31 centimeters tall and down-slope heights varying from 40 to 68 centimeters tall. Against the upslope edge of the alignment is a 1 meter wide level area of soil and cobbles which is present the length of the feature (Figure 38). The level area to the west of the feature measures 4.2 meters long by 2.7 meters wide. The surface in this area consists of a few collapsed cobbles on a soil and small cobble surface. Cultural material observed at Feature A consists of a single marine shell (*Cypraea* sp.) fragment, two coral chunks, communication wire, and a rusted can.

Feature B

Feature B is a rectangular-shaped cobble collection located in the central portion of Site 30109 at the base of a southwest facing ridge slope, approximately 7 meters west of Feature A (see Figure 37). The feature measures 1.63 meters long by 1.13 meters wide. It is constructed of small to large cobbles on its edges which enclose a level area of small to large pebbles mixed with soil (Figure 39). The feature has a maximum down-slope height of up to 35 centimeters and a maximum upslope height of up to 37 centimeters. On the level surface are seven rusted can fragments. Cultural material observed near Feature B includes communication wire, rusted metal cans, and a 1943 U.S. half-dollar that was found 4.1 meters to the southeast (Figure 40). It is likely that the enclosed portion of the feature was formerly slightly depressed from the surrounding ground surface and was later filled with soil and cobbles to create the current level surface. The dense collection of rusted metal cans indicate that this feature may have formerly functioned as a hearth.

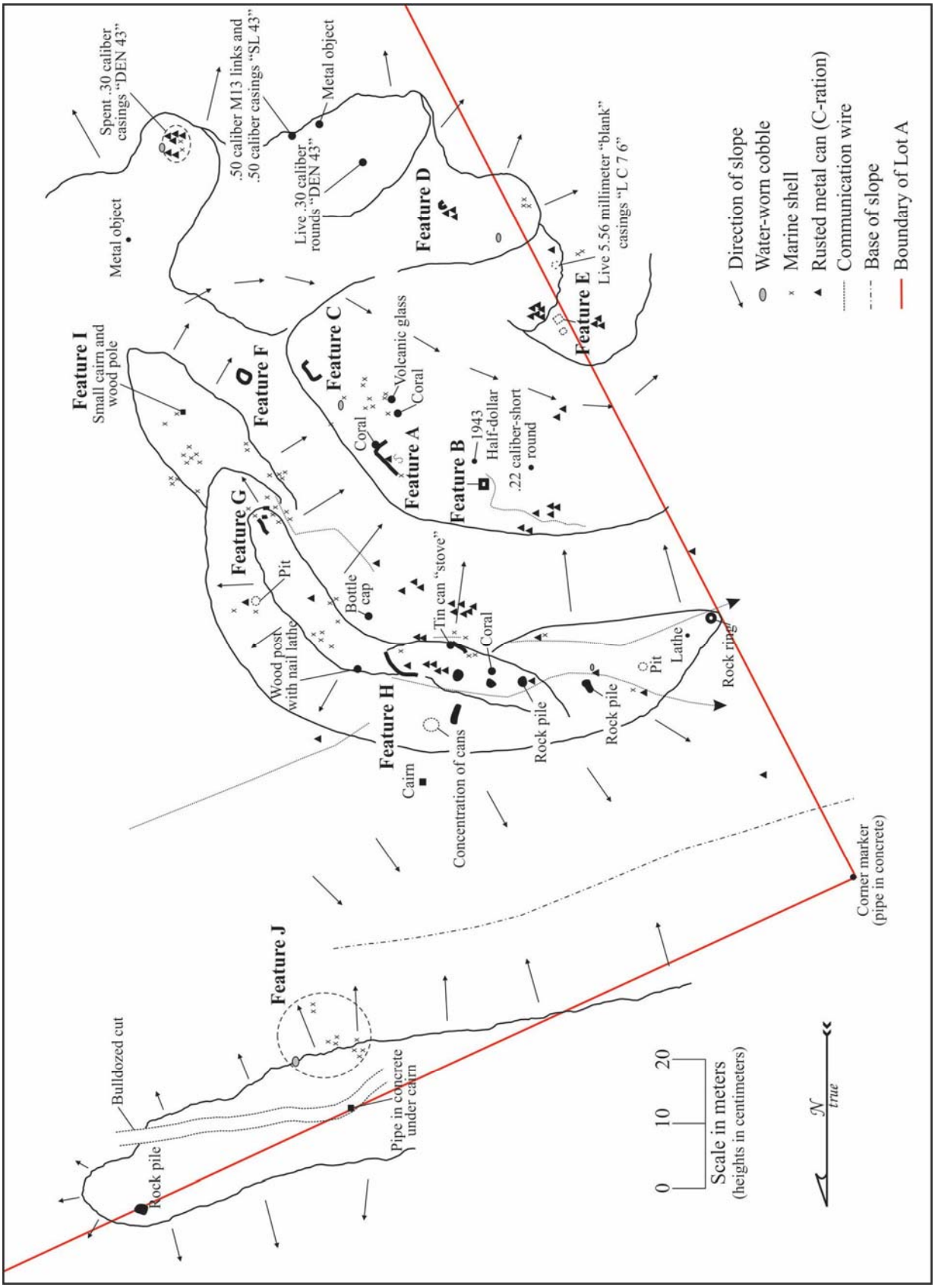

Figure 37. SIHP Site 30109 plan view.

Figure 38. SIHP Site 30109 Feature A, L-shaped alignment, view to the southeast.

Figure 39. SIHP Site 30109 Feature B, rectangular-shaped cobble collection, view to the northeast.

Figure 40. SIHP Site 30109 Feature B, 1943 U.S. Half-dollar found on the ground surface near Feature B.

Feature C

Feature C is a C-shaped alignment located in the central portion of Site 30109, approximately 12 meters southeast of Feature A and 5 meters southwest (down-slope) of Feature F (see Figure 37). Feature C is also situated at the base of the southwest facing ridge. The alignment measures 2.9 meters long by 2.4 meters wide and is constructed of loosely piled small to large cobbles and a few small boulders (Figure 41). It is mostly jumbled with collapse occurring down slope to the southwest (following the underlying ground surface). Feature C has a maximum upslope height of 37 centimeters and down-slope height standing up to 52 centimeters tall. The area immediately to the southwest of the alignment is relatively clear of rock material and consists of mostly exposed soil with gravels and small cobbles. There was no cultural material observed immediately adjacent to Feature C. A single water-worn cobble and a marine shell fragment were observed on the ground surface five meters northeast of the feature.

Feature D

Feature D is a small C-shaped construction located in the southern portion of Site 30109, approximately 17 meters southwest of Feature C and 13 meters southeast of Feature E (see Figure 37). The feature is situated on a gentle southwest facing slope of mostly soil with a few scattered cobbles. It measures 1.4 meters long by 1.3 meters wide and opens to the southwest. Feature D is constructed of loosely piled small to large cobbles that partially enclose a 0.6 meter by 0.53 meter area of exposed soil (Figure 42). It has an interior height of up to 22 centimeters tall and exterior height of up to 25 centimeters tall. Cultural material observed at Feature D includes a single fragment of metal shrapnel on the cobbles at its northwest end, and three metal can fragments on the ground surface immediately to the northwest.

Figure 41. SIHP Site 30109 Feature C, C-shaped alignment, view to the northeast.

Figure 42. SIHP Site 30109 Feature D, C-shaped construction, view to the northeast.

Feature E

Feature E is a potentially filled-pit located in the southwest portion of Site 30109, approximately 13 meters northwest of Feature D and 14 meters southwest of Feature B (see Figure 37). The former pit is situated on a gentle southwest facing slope of soil and scattered cobbles. Feature E is roughly square shaped, measuring 1.85 meters along each edge. The feature is currently only a slight depression (15 centimeters deep) in the ground, but appears to have been filled in as the soil and rock material within it does not match the surrounding ground surface (Figure 43). Located one meter to the northwest of Feature E is a second potential filled-pit. This second possible feature is less defined than the first, and it is difficult to determine if it ever was a pit, or simply part of the natural landscape. Like the other nearby feature, this area is mostly soil filled except it has a few scattered cobbles on the surface. It is possible that both pits originally formed as impact craters and were later reused as part of the military encampment. Rusted metal cans and shrapnel fragments are scattered on the ground surface surrounding Feature E. A collection of 5.56 mm (L C 76) crimped live "blank" rounds were scattered within a 50 centimeter area 4 meters south of the feature.

Figure 43. SIHP Site 30109 Feature E, potential filled-pit, view to the northeast.

Feature F

Feature F is a cleared, depressed surface located in the eastern portion of Site 30109, 5 meters northeast (upslope) of Feature C and 12 meters south of Feature G (see Figure 37). It is situated on a moderate southwest facing slope of soil, scattered cobbles, with a few areas of exposed bedrock. The feature is roughly rectangular in shape, measuring 4.3 meters long by 3 meters wide. It consists of a slightly depressed area of soil largely devoid of surface rocks that sits 10 to 25 centimeters below the surrounding ground surface (Figure 44). Small to large cobbles have been loosely placed along the edges of the level surface. No cultural material was observed at Feature F except a concentration (twelve fragments) of shrapnel in the southeast corner of the level surface. The shrapnel could indicate that the feature originated as an impact crater. A small cairn (Feature I) and wooden pole are located 6 meters upslope of Feature F on a level surface at the top of a low section of the ridge formation, and marine shell fragments are scattered on the slope between these two features.

Figure 44. SIHP Site 30109 Feature F, view to the north.

Feature G

Feature G is a collapsed wall segment located in the northeast portion of Site 30109, 12 meters north of Feature F and 15 meters southeast of Feature H (see Figure 37). The wall is situated on a moderate southeast slope near the top the prominent ridge formation at Site 30109. Feature G measures 5 meters long by 2.7 meters wide and is constructed of loosely piled small and large cobbles (Figure 45). The feature is mostly intact along its west facing edge, while the east facing edge slopes toward the northeast following the underlying contour. The west facing edge has heights varying from 27 to 53 centimeters tall. At the southern end of the wall is an area of approximately 20 scattered cobbles, which stands 19 to 24 centimeters tall. It appears that these cobbles may have been formerly stacked as part of the wall. The area to the west of the wall is mostly level with small gravels, soil, and a few scattered cobbles. Cultural material observed at Feature G consists of three marine shell (*Cypraea* sp.) fragments at the base of the wall's west edge.

Feature H

Feature H is a modified ridge top located in the north-central portion of Site 30109, roughly 15 meters northwest of Feature G and 13 meters north (upslope) of Feature B (see Figure 37). Feature H is situated at the top (highest point) of the east/west running ridge with excellent views of all directions from the feature (Figure 45). The modified area measures 15 meters long by 14 meters wide. Modifications to the ridge top consist of roughly five rock piles that vary in size and shape (Figure 46). Exposed bedrock forms the north edge of the feature while rock piles along the east, west, and south edge's define the limits of the modified area (Figure 47). The level area defined by the rock piles consists of mostly soil mixed with small gravel and cobbles. Cultural material within the level area consists of communication wire, milled lumber, rusted metal cans, a metal can "stove" (Figure 48), a coral chunk, a plastic lighter, and marine shell (*Cypraea* sp.).

Additionally, along the ridge's north facing slope is a linear rock pile (Figure 49) and cobble filled depression (Figure 50), which are likely associated with the features at the top of the ridge. The cobble filled depression sits 20 centimeters below the surrounding ground surface has a dense concentration of rusted metal cans scattered throughout.

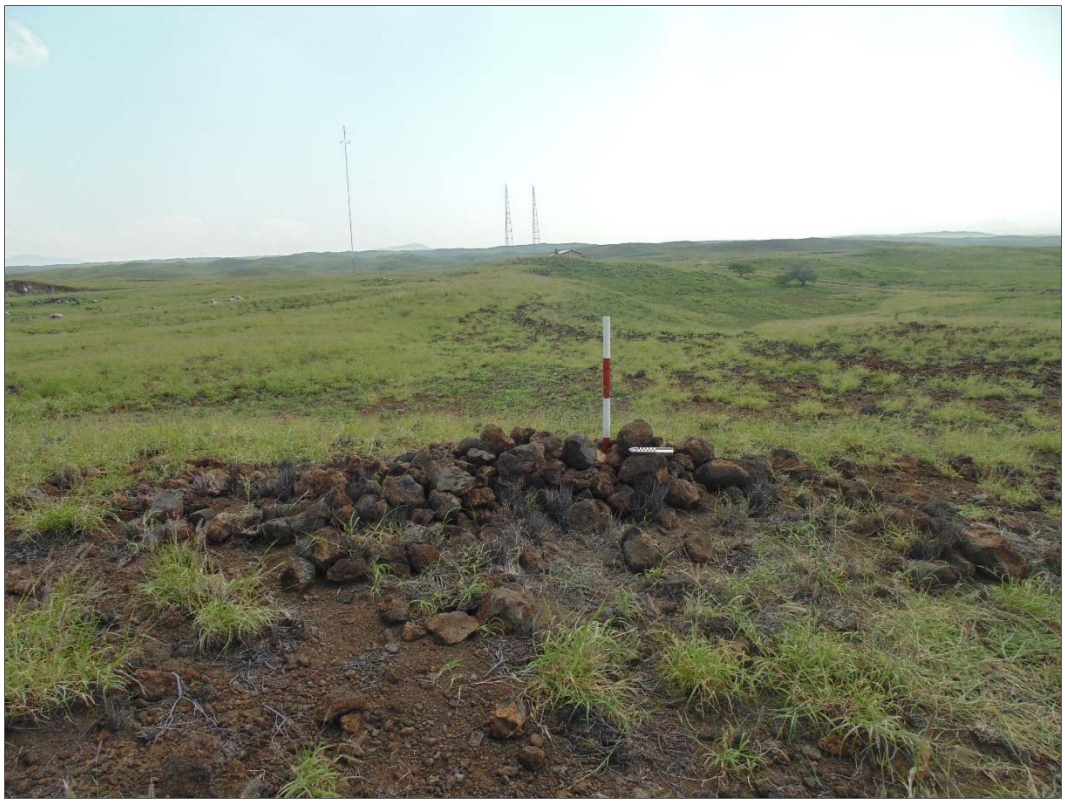

Figure 45. SIHP Site 30109 Feature G, collapsed wall segment, view to the east.

Figure 46. SIHP Site 30109 Feature H, modified ridge top, view to the west.

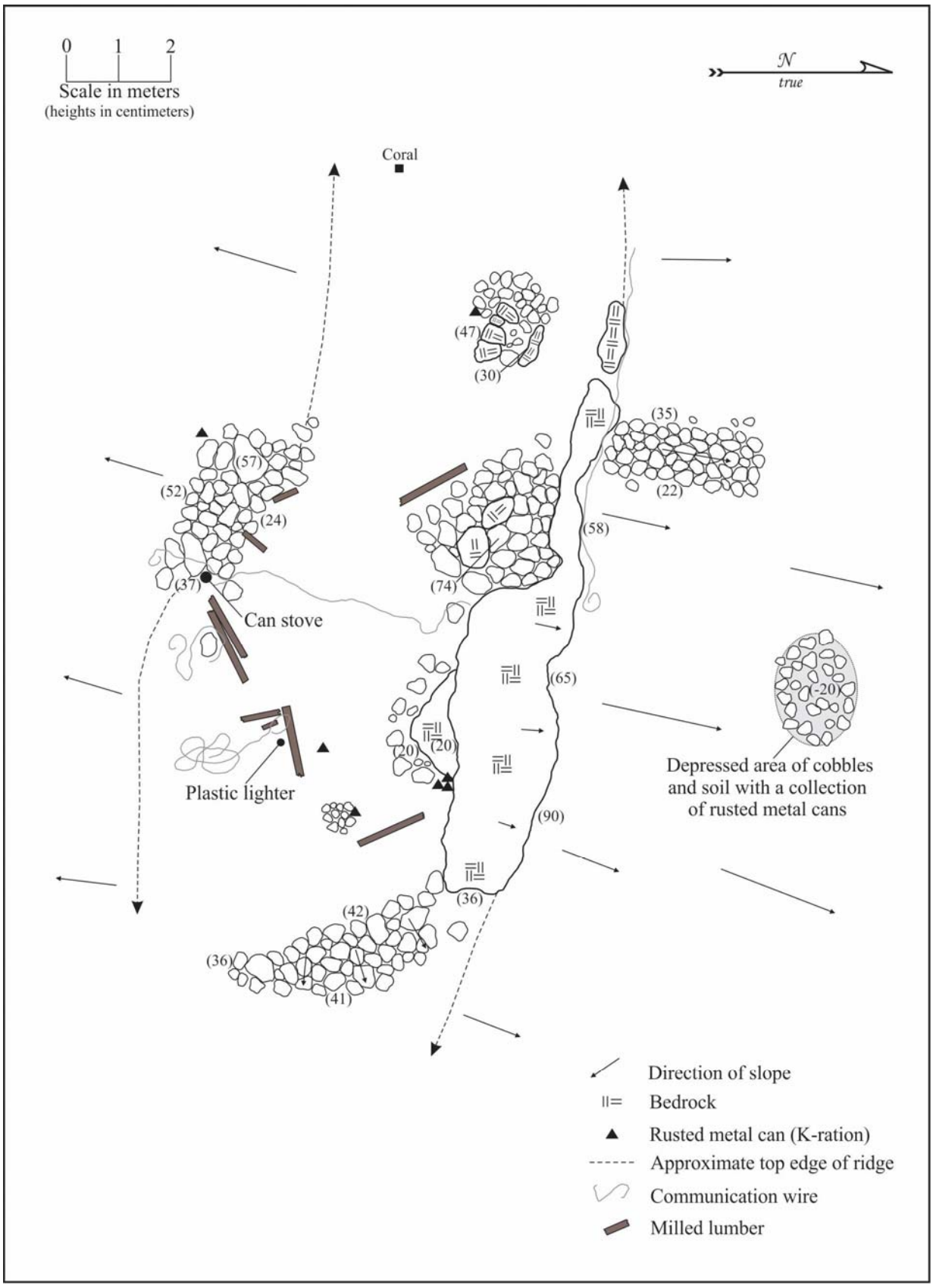

Figure 47. SIHP Site 30109 Feature H plan view.

Figure 48. SIHP Site 30109 Feature H, communication wire and milled lumber, overview.

Figure 49. SIHP Site 30109 Feature H, metal can "stove" in-situ, overview.

Figure 50. SIHP Site 30109 Feature H, linear rock pile along the ridge's northern slope, view to the south.

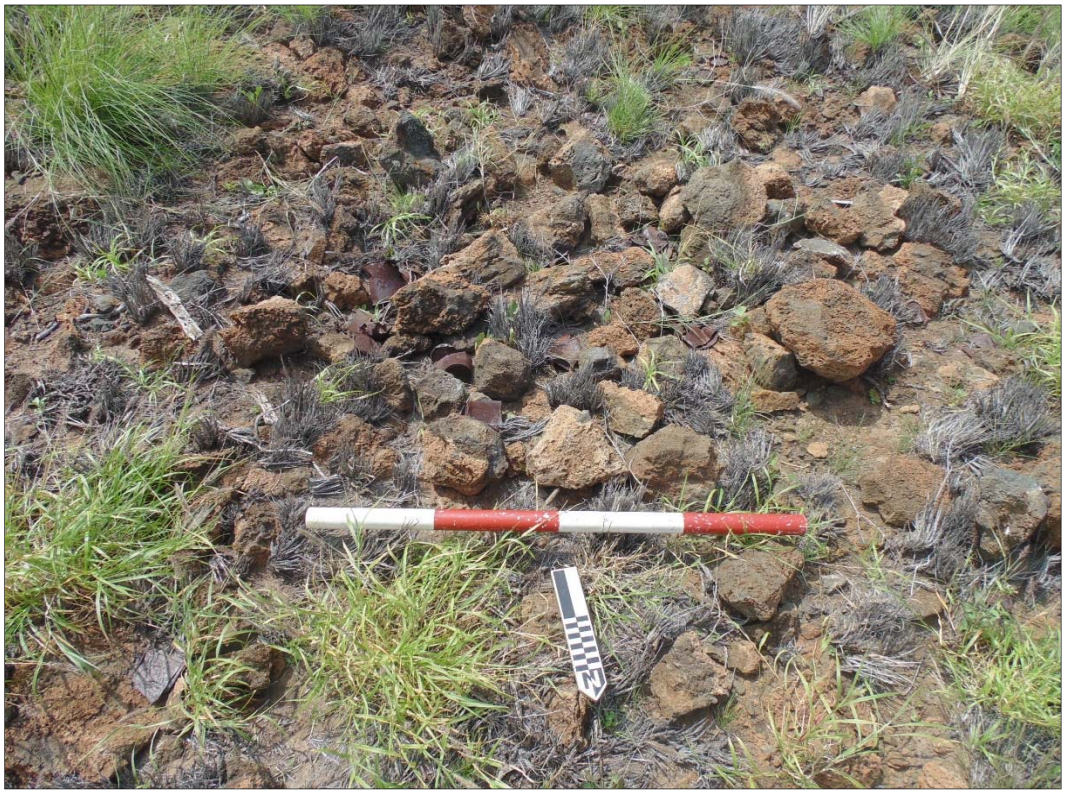

Figure 51. SIHP Site 30109 Feature H, cobble filled depression with rusted metal cans, view to the south.

Feature I

Feature I is a small pile located 6 meters upslope of Feature F on a level surface at the top of a low section of the cresent-shaped ridge formation at Site 30109 (see Figure 37). The pile is constructed of roughly fifteen small to large cobbles (Figure 52). It measures 50 centimeters in diameter by 30 centimeters tall. A modern looking length of 1" x 1" milled lumber is lying on the ground to the south of the pile. A few marine shell fragments are scattered on the slope between Features F and I. It is possible that Feature I once served as a visual marker. It is not clear if the feature is associated with the World War II use of the camp, or later use of the general project area.

Figure 52. SIHP Site 30109 Feature I, small rock pile, view to the west.

Feature J

Feature I is a marine shell scatter and water-worn cobble on a ridge to the north of Feature H, on the opposite side of a natural drainage (see Figure 37). The marine shell scatter is situated at the top and along the south facing ridge slope. The marine shell is scattered within a 3 meter long by 2.5 meter wide area and consists primarily of *Cypraea* sp. shell fragments. A single water-worn cobble was observed at the east end of the marine shell scatter (Figure 53). A bulldozer cut road runs in an east/west direction on the top of the ridge, approximately 3 meters north of Feature J. Along the north edge of this road is a pipe set-in concrete beneath a cairn, 5 meters from the marine shell scatter. Near this pipe is a coil of modern metal wire. Roughly 30 meters northeast of the water-worn cobble, at the top edge of the ridge, is an isolated rock pile marking the northern boundary of the project area.

Discussion of Artifacts and Site Function

Historic Era artifacts observed at Site 30109 include concentrations of munitions along the southwest edge of the site (see Figure 37). The location of the ammunition concentrations (Figure 54) appear to correspond to defensive firing positions on the edges of the former encampment (Figure 55). At these firing positions there are 4 types of small munitions (spent .30 caliber M1 cartridges marked "DEN 43", spent .50 caliber BMG cartridges marked "SL 43", unfired 5.56 mm blank rounds marked "L C 7 6", and a single .22 caliber short cartridge). In addition to the munitions, a few .50-caliber M13 links (Figure 55), rusted metal cans (mostly C-rations; Figure 57), various metal objects (Figure 58 and Figure 59), communications wire, a metal can stove (see Figure 49), milled lumber, and a 1943 U.S. Half-dollar (see Figure 40) were observed at Site 30109. Headstamp dates on two types ammunitions ("D E N 43" and "S L 43") (Figure 60 and Figure 61) indicate that they are military rounds produced in 1943, while a third type of ammunition ("L C 7 6") (Figure 62) has a headstamp indicating that it was produced in 1976.

It appears that most of the metal cans at Site 30109 are World War II era C-rations. In the late 1930s the U.S. military began standardizing a system of rations that are easily carried and provide a well-balanced diet for combat soldier's to carry and eat in the field. During the late 1930s to the 1940s the military developed five types of rations (A-ration, B-ration, C-ration, K-ration, and D-ration). The A-ration, consisted of fresh food products prepared at a mess hall. The B-ration was the same as the A-ration with the substitution of canned and dehydrated foods where refrigeration was not available. Field rations used by combat troops in the field during World War II consisted of, Type C (complete pre-cooked, ready-to-eat canned individual meal), Type D (designed as a short duration individual "assault" ration for paratroopers and other specialized light infantry forces), and Type K (designed as a short duration individual "assault" ration for paratroopers and other specialized light infantry forces) are individual combat rations intended to provide food for soldiers for up to five days. The C-ration was used as the military's primary "combat" ration until 1958. A C-ration consisted of 3 cans containing a meat and vegetable component, and 3 cans, containing crackers, sugar, and soluble coffee; it furnished 2974 calories, 114 grams of protein, and an adequate supply of vitamins and minerals (http://www.foxco-2ndbn-9thmarines.com/c-rations.htm).

Figure 53. SIHP Site 30109 Feature I, water-worn cobble along the north edge of the feature, overview with 20 centimeter scale.

According to the *Department of the Army Field Manual No. 24-20*, "Field-Wire Techniques," from May of 1956, the communication field-wire observed at Site 30109 is (Wire Type WD-1/TT), commonly used by the U.S. military during World War II (also earlier and later) to establish field-wire communications systems in order to provide tactical units with telephone, teletypewriter, and facsimile services (1956:4). Aerial construction is the recommended method for installing this type of communications system because it is the easiest to maintain or change, and provides better quality circuits than surface construction, but it can also be laid out across the ground surface to disguise the wire route and to provide quicker communication capability.

Based on the predominance of World War II era artifacts at Site 30109 it appears that the encampment was occupied by the U.S. military for training purposes at some point after 1943, but likely before 1946. It is probable that Feature H, which occupies the most prominent point on the ridgeline, may have been a command center as it has views in all directions and most of the communication wire. Features A, C, F, and G appear to be the location of former camp/tent areas. Feature B may be a filled fire hearth. Feature D is of uncertain function, but may have been associated with defensive firing positions established along the ridgeline at the southwestern edge of the site, where a number of ammunition concentrations were noted. Feature E is of unknown function, but may be a former latrine pit or a utilized impact crater. A 1943 U.S. Half-dollar found near Feature B and the dates on the ammunition headstamp's indicate that the military's occupation of Site 30109 certainly occurred after 1943. The marine shell observed at the site could have supplemented the C-rations eaten by the soldiers. It is more likely, however, when the presence of coral, volcanic glass, and water-worn cobbles are also considered, that Site 30109 had an earlier habitation component, and some of the features could have been preexisting at the time of the military occupation (particularly Features A, C, F, and G located in the lee of the prominent ridge). As suggested by Soehren (1984), the site could have been occupied prior to World War II by "Hawaiian cowboys", or even earlier for temporary habitation purposes during the Precontact Period.

Figure 54. SIHP Site 30109 munitions scatter along the southwest edge of the site.

Figure 55. SIHP Site 30109, general area of munitions scatter and defensive firing positions, view to the northeast.

Figure 56. SIHP Site 30109, .50 caliber ammunition clip, overview.


Figure 57. SIHP Site 30109, example of the rusted metal cans (C-rations), overview.

Figure 58. SIHP Site 30109, metal object, overview.

Figure 59. SIHP Site 30109, metal object on the ground surface near the south edge of the site, overview.

Figure 60. SIHP Site 30109, .30-caliber M1 bullet cartridge with headstamp "D E N 43," overview.

Figure 61. SIHP Site 30109, .50-caliber M13 bullet cartridge with headstamp "S L 43," overview.

Figure 62. SIHP Site 30109, .30-caliber blank bullet cartridges with headstamp "L C 7 6," overview.

SIHP Site 30110

Site 30110 is a complex of five cairns (Features A-E) located in the northeast portion of Lot A of the Lālāmilo survey area, adjacent to the fence that marks Lālāmilo/Waikōloa *ahupua'a* boundary (see Figure 29). The cairns, which occur next to a concrete monument marking a change in direction in the Waikōloa/Lālāmilo boundary, are situated at the top of a southwest sloping landform near its southern edge to the north of the fenceline. Site 30110 measures 40 meters long by 7 meters wide and is constructed on a level surface of scattered cobbles and soil with a few areas of exposed bedrock (Figure 63). Vegetation at Site 30110 is limited to buffel grass (*Cenchrus ciliaris*), fountain grass (*Pennisetum setaceum*), and *'ilima* (*Sida fallax*). Detailed descriptions of Features A-E of Site 30110 are presented below.

Feature A

Feature A is a cairn located at the southwest end of Site 30110 (see Figure 63). The cairn measures 1.6 meters long by 1.4 meters wide. It is constructed of approximately 50 large cobbles (Figure 64). The concrete monument at Site 30110 is located on the ground surface adjacent to the rock pile's southwest edge (Figure 65).

Feature B

Feature B is a cairn located in the southwest portion of Site 30110, approximately 11 meters northeast of Feature A (see Figure 63). The cairn consists of a single course collection of 8 large cobbles. It measures 1.6 meters long by 1.35 meters wide with a maximum height of 25 centimeters tall (Figure 66).

Feature C

Feature C is a cairn located in the central portion of Site 30110, approximately 6 meters northeast of Feature B (see Figure 63). It measures 2.6 meters long by 2.25 meters wide and is constructed of approximately 80 small cobbles and a few large cobbles loosely piled together (Figure 67). The cairn has a maximum height along its upslope edge of 22 centimeters and a down-slope height standing up to 37 centimeters tall.

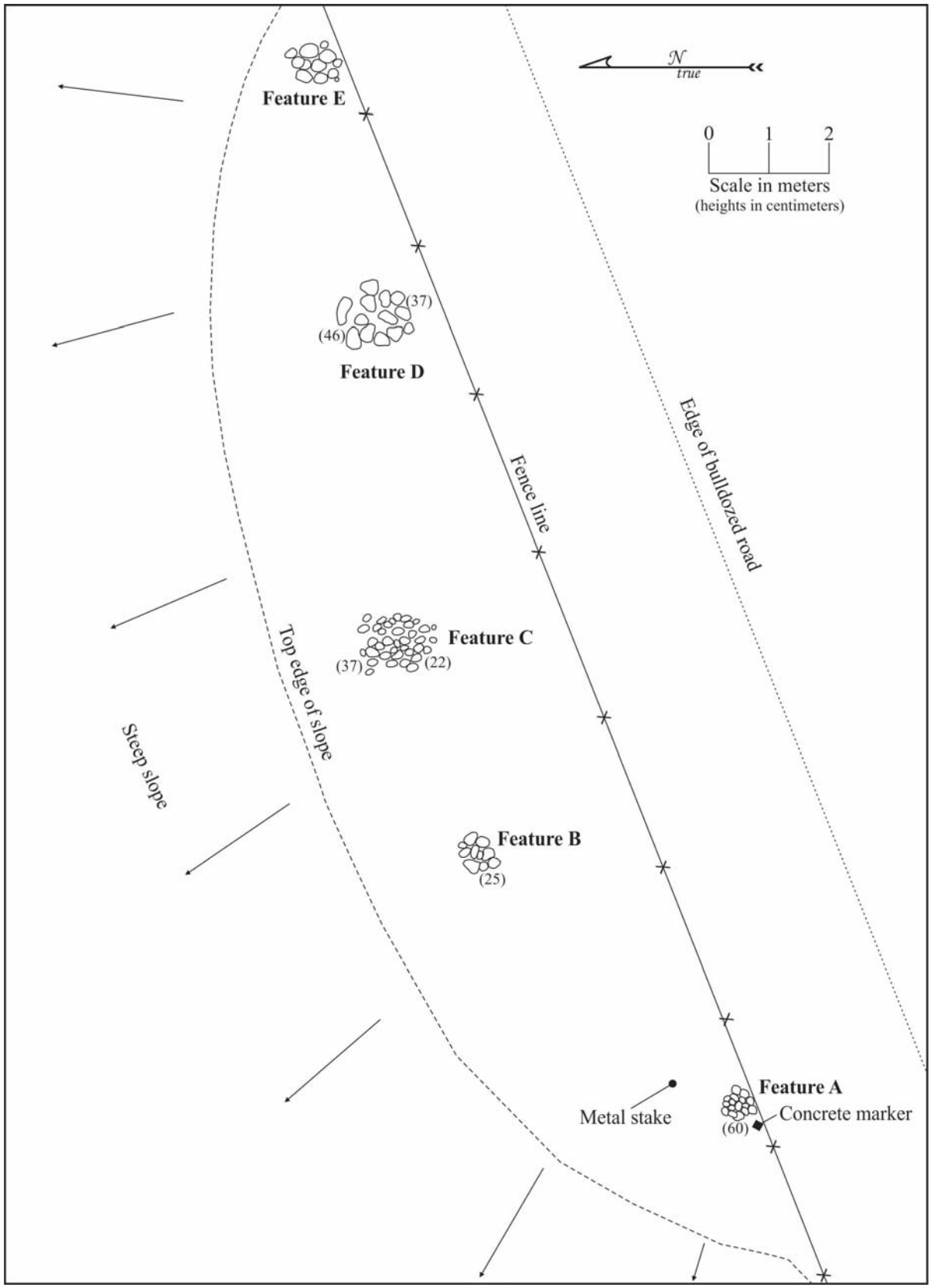

Figure 63. SIHP Site 30110 plan view.

Figure 64. SIHP Site 30110 Feature A, view to the southeast.

Figure 65. SIHP Site 30110 Feature A, concrete monument next to fence line, view to the southwest.

Figure 66. SIHP Site 30110 Feature B, view to the southeast.

Figure 67. SIHP Site 30110 Feature C, view to the north.

Feature D

Feature D is a cairn located in the eastern portion of Site 30110, approximately 9 meters east of Feature C (see Figure 63). It measures 2.7 meters long by 2.35 meters wide and is constructed of approximately 50 piled large cobbles and small boulders (Figure 68). This rock pile has a maximum height along its upslope edge of 37 centimeters and along its down-slope edge it stands up to 46 centimeters tall. Some of the cobbles exhibt mechanical scarring, as if moved to this location after being impacted by a bulldozer.

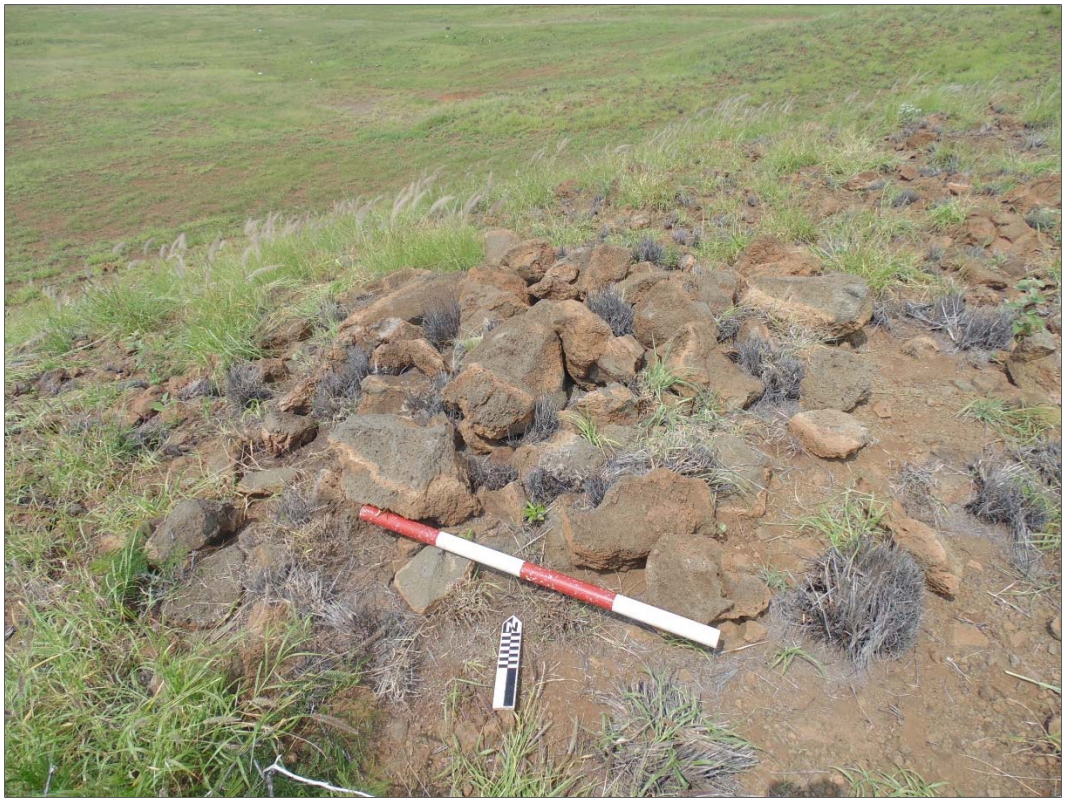

Figure 68. SIHP Site 30110 Feature D, view to the north.

Feature E

Feature E is a cairn located at the northeast end of Site 30110, approximately 7 meters northeast of Feature D (see Figure 63). It measures 2 meters long by 1.7 meters wide and is constructed of roughly 20 medium and large cobbles against a large bedrock boulder adjacent to the fence line (Figure 69). Feature E has a maximum height of up to 50 centimeters tall. Mechanical scarring is also present on some of the cobbles used in the construction of Feature E.

Based on the location of Site 30110, on top of a hill along the Lālāmilo/Waikōloa *ahupua'a* boundary at a point where it changes direction, it is likely that the cairns were constructed as boundary markers. Hawai'i Registered Map No. 2993 prepared by Chas L. Murray in 1929 (see Figure 21) indicates the presence of a concrete monument along the boundary of Lālāmilo and Waikōloa *ahupua'a* at the location of Site 30110, which is likely the same concrete monument that is situated adjacent to Feature A (see Figure 65). Given that the concrete monument is a low construction, the cairns of Site 30110 were likely constructed as more prominent visual markers of the Waikōloa/Lālāmilo boundary that would be evident from some distance away. These cairns are most likely Historic or Modern constructions, and probably post-date the placement of the concrete monument indicated on the 1929 map. Rocks at Features D and E exhibit signs of mechanical scarring and are likely the most recent cairns, built after the bulldozed road adjacent to the south edge of the fence line and at the base of the steep slope to the north of Site 30110 were constructed. A second concrete monument marking the Waikōloa/Lālāmilo boundary is shown on the 1929 map to the west of Site 30110 at a location "Kapaakea" where there is another turn in the *ahupua'a* boundary. This monument was also identified in the field, and is identical to the one at Feature A (Figure 70).

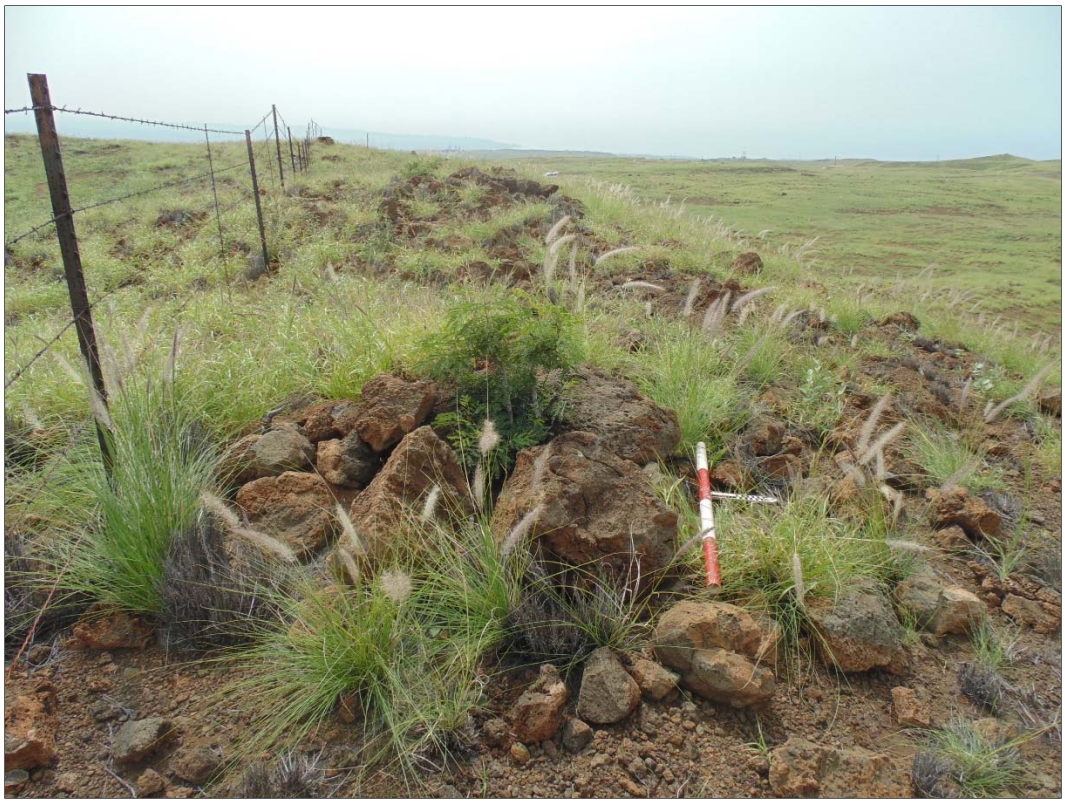

Figure 69. SIHP Site 30110 Feature E, view to the west.

Figure 70. Concrete monument at "Kapaakea" along the boundary between Waikōloa and Lālāmilo *ahupua'a*, view to the southwest.

5. SIGNIFICANCE EVALUATION AND TREATMENT RECOMMENDATIONS

The recorded archaeological sites are assessed for their significance based on criteria established and promoted by the DLNR-SHPD and contained in the Hawai‘i Administrative Rules 13§13-284-6. This significance evaluation should be considered preliminary until DLNR-SHPD provides concurrence. For a resource to be considered significant it must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

A Be associated with events that have made an important contribution to the broad patterns of our history;

B Be associated with the lives of persons important in our past;

C Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

D Have yielded, or is likely to yield, information important for research on prehistory or history;

E Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity.

The significance and recommended treatments for the three recorded sites are presented in Table 3 and discussed below.

Table 3. Site significance and treatment recommendations.

SIHP Site #	*Site Type*	*Temporal Affiliation*	*Significance*	*Recommended Treatment*
9012	Historic wall	Historic	A, D	Preservation
30109	World War II military encampment with a possible traditional Hawaiian habitation component	Historic/Precontact	A, D	No further work
30110	Boundary marker	Historic/Modern	D	No further work

Site 9012 is a late nineteenth/early twentieth century dry-stacked rock wall that was likely built by Parker Ranch. As such this site is significant under Criterion A because it is associated with events that have made an important contribution to the broad patterns of our history. This site is also considered significant under Criterion D for its research value. The current proposed project will have no effect on this site as the wall has an existing gated breach at access Easement J, and the continued preservation of this site is the recommended treatment.

Site 30109 is a WWII-era military encampment associated with training activities conducted within the greater Camp Tarawa Waikoloa Maneuver Area. Some of the features of the encampment, which occurs in the lee of a prominent ridge formation, may have been previously occupied during the earlier Historic Period or Precontact Period for temporary habitation purposes, and then reutilized for military purposes. This site, because of its association with World War II, reflects activities that when considered in their totality were important locally, nationally, and ultimately globally; and as such this site is considered significant under Criterion A. It is also considered significant under Criterion D for its historical research value. Although this site will not likely be directly impacted by the proposed wind farm construction activities, it may be indirectly impacted by increased use of the area; however, the thorough documentation of this site during the current study has mitigated such potential impacts and no further work is the recommended treatment.

Site 30110 is a series of Historic/Modern boundary markers that are considered significant under Criterion D. This site has been fully and comprehensively documented as a result of the current study and no further work is the recommended treatment.

.

6. A CONSIDERATION OF POTENTIAL VISUAL IMPACTS

In their review of an earlier draft of the current report (DOC NO.: 1407MV29), DLNR-SHPD requested an assessment of the visual impacts that the proposed project might have on the larger archaeological landscape of South Kohala. Hawai‘i Administrative Rules 13§13-284-7 (b) lists visual impacts as a type of impact that should be considered with respect to historic properties. Potential visual impacts resulting from the development of the Lālāmilo Wind Farm project were a consideration of both the Environmental Assessment (EA) and an accompanying Cultural Impact Assessment (CIA). Visual impacts are typically considered indirect impacts, affected the aesthetic characteristics of a given historic property or landscape, and as such the evaluation of visual impacts is a highly subjective undertaking. The potential exists for visual impacts to historic properties both within the wind farm development area as well as outside of the development area. While the wind turbine towers will be prominently visible from all of the sites identified within the development area (see Table 3), it is suggested here that given the nature of these sites there will be no impact to the aesthetic characteristics of these site.

With respect to potential impacts on sites further afield within the greater South Kohala Landscape, a CIA (Rechtman and Kepa‘a 2014) was conducted for this project in which the potential visual impacts to cultural practices (and by extension resources) that occur at Pu‘ukoholā Heiau were assessed. While located 4.5 miles *makai* of the current project area, the traditional view plane to the east from Pu‘u Kohola Heiau would catch a glimpse of the proposed wind turbines. Thus, a view plane analysis (Figure 71) was prepared, and consultation was sought with the National Park Service as stewards of this site as well as with cultural practitioners that use the *heiau*. While suggestions were offered to conceal the turbines as much as is possible, those consulted agreed that the visual impact to Pu‘ukoholā Heiau and the cultural practices that occur there would be minimal if at all.

DLNR-SHPD specifically requested that an assessment of the visual impacts to the Lālāmilo Agricultural Complex be made. To that end, a visual simulation was prepared from a feature situated on the most elevated *pu‘u* within the site complex and located 3.6 miles *mauka* of the current project area (Figure 72). As can be seen in the view plane analysis (Figure 73), the very tops of the wind towers will be visble on the low horizon, but only barely so. It is our conclusion that as the view point for the observer in the photograph is where the wind towers will be most visible from within the Lālāmilo Agricultural Complex (and as such are only barely so) there will be no visual impact to the agricultural complex as a result of their construction.

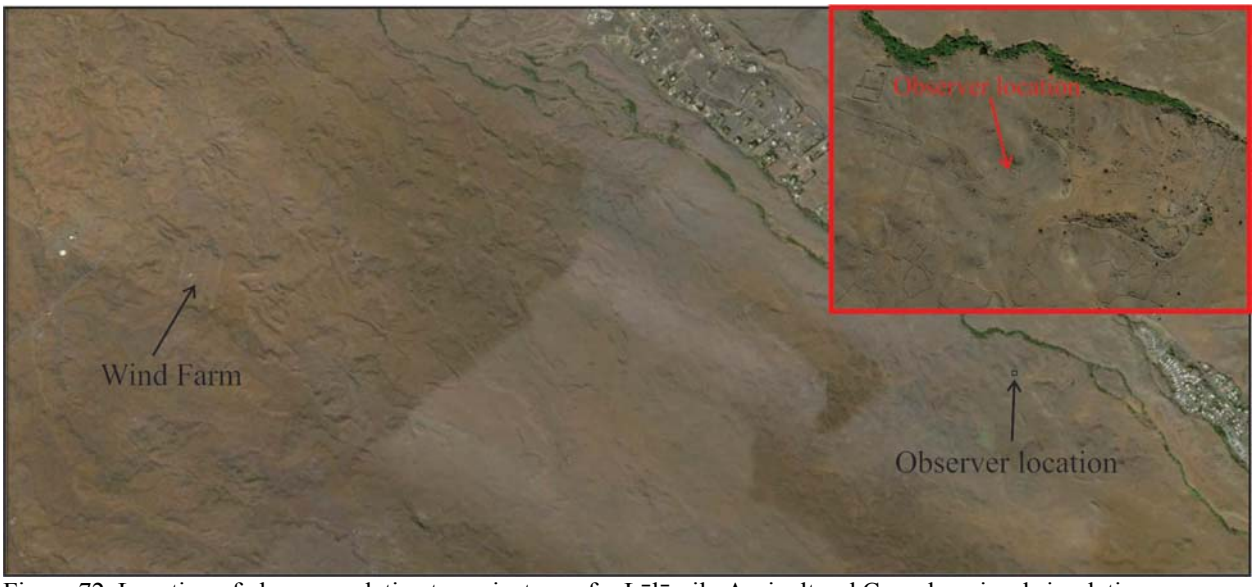

Figure 72. Location of observer relative to project area for Lālāmilo Agricultural Complex visual simulation.

Figure 71. Visual simulation of the view plane looking east from Puʻukoholā Heiau.

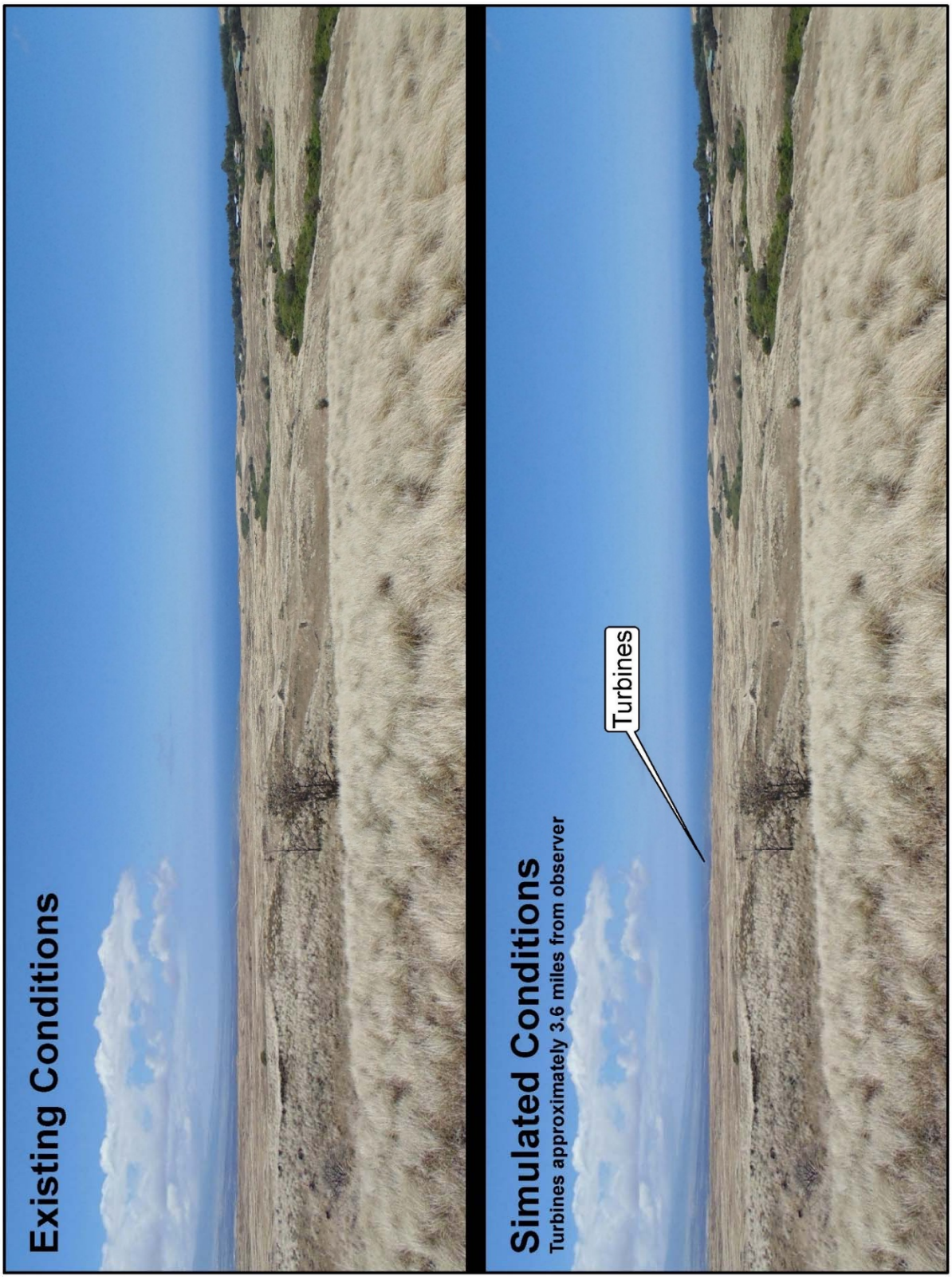

Figure 73. Visual simulation of the view plane looking westward from with the Lālāmilo Agricultural Complex.

REFERENCES CITED

Barrera, W., Jr.

1971 Anaehoomalu: A Hawaiian Oasis. Preliminary Report of Salvage Research in South Kohala, Hawaii. *Pacific Anthropological Records* No. 15. Department of Anthropology, B.P. Bishop Museum, Honolulu.

1993 Lalamilo, South Kohala, Hawaii Island: Archaeological Inventory Survey of Sandalwood Estates (TMK: 6-6-01:38). CHINIAGO Inc. Prepared for Maryl Development Inc.

Barrera, W., Jr., and M. Kelly

1974 Archaeological and Historical Surveys of the Waimea to Kawaihae Road Corridor, Island of Hawaii. Departmental Report Series 74(1). Department of Anthropology, B.P. Bishop Museum, Honolulu. Prepared for the Department of Transportation, State of Hawaii.

Barrère, D.

1983 Notes on the Lands of Waimea and Kawaihae. Report 2, in Jeffrey T. Clark and Patrick V. Kirch (eds.), *Archaeological Investigations of the Mudlane-Waimea-Kawaihae Road Corridor, Island of Hawai'i*, pp. 25-38. Department Report 83-1. Dept. of Anthropology, Bernice P. Bishop Museum, Honolulu.

Bergin, B.

2004 *Loyal to the Land: The Legendary Parker Ranch, 750-1950.* University of Hawai‘i Press, Honolulu.

2006 *Loyal to the Land: The Legendary Parker Ranch, 1950-1970: Volume 2, The Senior Stewards.* University of Hawai‘i Press, Honolulu.

Bevacqua, R.

1972 Archaeological Survey of Portions of Waikoloa, South Kohala District, Island of Hawaii. *Departmental Report Series* 72-4. Department of Anthropology, B.P. Bishop Museum, Honolulu. Prepared for Boise Cascade Properties, Inc.

Brundage, L.

1971 *Alfred W. Carter Hawai'i's Dean of Cattlemen and Notes on Hawaiian Livestock.* Privately printed, Kamuela, Hawai‘i.

Bowser, G. (compiler)

1880 The Hawaiian Kingdom Statistical and Commercial Directory and Tourists Guide. Honolulu and San Francisco: George Bowser and Co.

Burgett, B., and P. Rosendahl

1990 Phase I—Site Identification Phased Archaeological Inventory Survey, Puako Beach Road Extension Corridor, Land of Lalamilo, South Kohala District, Island of Hawaii (TMK:3-6-9-01:Por.12). PHRI Report 715-101890. Prepared for The Keith Companies, Hawaii.

1993 Summary of Archaeological Inventory Surveys, Kapaanui Agricultural Subdivision and Mahukona Property, Lands of Kapaanui, Kou, Kamano, Maukona 1st and 2nd, Hiliu, and Kaoma, North Kohala District, Island of Hawaii. (TMK:3-5-7-02:11 and TMK3-5-7-03:1-3,10-14,16-18). PHRI Report 743-020993. Prepared for Chalon International of Hawaii, Inc.

Burgett, B,P. Rosendahl, and S. Goodfellow
1992 Preliminary Report: Background, Summary of Findings, and General Significance Assessments and Recommended General Treatments, Phase I - Site Identification, Phased Archaeological Inventory Survey, Hapuna State Park Expansion Area. Land of Lalamilo, South Kohala District, Island of Hawaii. PHRI Report 855-092790. Prepared for Mr. Warren M. Harrison.

Burtchard, G.
1995 Population and Land Use on the Keauhou Coast, the Mauka Land Inventory Survey, Keauhou, North Kona, Hawai‘i Island. Part I: Narrative Volume. International Archaeological Research Institute, Inc. (IARII). Prepared for Belt Collins and Associates and Kamehameha Investment Corporation, Honolulu.

Burtchard, G. and M. Tomonari-Tuggle
2002 The Waimea Agricultural System Reconsidered: Implications of the Waimea Town Center Project. Paper presented at the Society for Hawaiian Archaeology, Kaua‘i, October 11-13, 2002.

Carlson, A. K., and P. Rosendahl
1990 Summary of Findings, and General Significance Assessments and Recommended General Treatments, Phase II - Data Collection, Phased Archaeological Inventory Survey, Queen’s Lands at Mauna Kea, Land of Kawaihae 2nd, South Kohala District, Island of Hawaii. PHRI Interim Report 591-030990. Prepared for Mauna Kea Properties, Inc.

Cartwright, B.
1933 *Some Aliis of the Migratory Period*. Honolulu, Hawaii. The Museum.

Chaffee, D. and R. Spear
1994 An Archaeological Inventory Survey for the Kohala Water Transmission System Project, North Kohala and South Kohala Districts, Island of Hawai‘i (TMK (3) 6-1-001:003). Scientific Consultant Services Report H-01394. Prepared for Megumi Kon, Inc. Hilo, Hawaii.

Chinen, J.
1961 *Original Land Titles in Hawaii.* Honolulu: privately published.

Ching, F.
1979 Archaeological Reconnaissance Survey of Approximately 400 acres of Olo Hana Corporation Property at Ouli, Kohala, Hawaii Island. ARCH Report, Lawai.

Clark, J.
1981 Archaeological Survey of the Proposed Lalamilo Agricultural Park, South Kohala, Island of Hawaii. Manuscript. B.P. Bishop Museum Library, Honolulu.

1987 Waimea-Kawaihae, A Leeward Hawaii Settlement Pattern. Unpublished Ph.D. dissertation, Department of Anthropology, University of Illinois at Urbana-Champaign.

Clark J.T., and P. Kirch (Eds.)
1983 Archaeological Investigations of the Mudlane-Waimea-Kawaihae Road Corridor, Island of Hawai‘i. An Interdisciplinary Study of an Environmental Transect. *Departmental Report Series* 83-1. Department of Anthropology, B.P. Bishop Museum, Honolulu. Prepared for Department of Transportation, State of Hawaii.

Clark, M., and R. Rechtman
2005 An Archaeological Inventory Survey of Two Proposed Water Tank Locations on TMK:3-6-8-02:19 (por.). Waikōloa Ahupua‘a, South Kohala District, Island of Hawai‘i. Rechtman Consulting Report RC-0262. Prepared for Greg Fukumitsu, Tom Nance Water Resources Engineering, Honolulu, Hawai‘i.

2011 An Archaeological Inventory Survey of a Proposed Access Road and Two Water Tank Locations on TMK: 3-6-8-01:024 (por.). Waikōloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi. Rechtman Consulting Report RC-0725. Prepared for David Patnoi C/O Sheldon Yamasato. Akinaka & Associates, Inc., Honolulu, Hawaiʻi.

Clark, M., J. D. Nelson, A. K. Dircks Ah Sam, and R. Rechtman
2014 Archaeological Inventory Survey of TMKs: (3) 6-8-01:024 and 060 Waikōloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi. ASM Project Number 21350. Prepared for Barry Aiden, The True Life Companies/SVP Development, CA.

Cordy, R.
1994 A Regional Synthesis of Hamakua District, Hawaiʻi Island. Historic Preservation Division, DLNR, State of Hawaiʻi.

Damon, E.
1927 Father Bond of Kohala. *The Friend*, Honolulu.

Department of the Interior
1912 *Reports of the Department of the Interior For the Fiscal Year Ended June 30, 1911*. Volume II. U.S. Government Printing Office, Washington.

Doyle, E.
1953 Makua Laiana: The Story of Lorenzo Lyons. Compiled from the manuscript journals, 1832-1886. Honolulu, Honolulu Star Bulletin.

Dunn, A. and P. Rosendahl.
1989 Archaeological Inventory Survey, Kapaanui Agricultural Subdivision, Lands of Kapaanui and Kou, North Kohala District, Island of Hawaii. PHRI Report 568-100289. Prepared for Ahualoa Development, Inc.

1992 Phased Archaeological Inventory Survey, Puako Beach Road Extension Corridor, Land of Lalamilo, South Kohala District, Island of Hawaii (TMK:3-6-9-01:Por.12,Por.17). PHRI Report 975-050592. Prepared for Paniau Partners.

Ellis, W.
1969 *Polynesian Researches, Hawaii*. Rutland, Vermont: Charles E. Tuttle Company, Inc., 1831. Reprint.

2004 *Journal of William Ellis, A Narrative of an 1823 Tour Through Hawai'i*. Mutual Publishing.

Escott, G.
2008 Archaeological Monitoring Plan (AMP) for Munitions and Explosives of Concern (MEC) and Supporting Functions for Former Waikoloa Maneuver Area, Hawaiʻi on Portions (1,320.063 acres) of the Former Waikoloa Maneuver Area, Lālāmilo and ʻŌuli Ahupuaʻa, South Kohala District, Hawaiʻi [TMK: (3)-6-2-001:050, 051, 065; AND (3)-6-6-02:031, 032, 034, 035, 39-43]. SCS Project Number 970-1. Prepared for U.S. Army Engineer District: Honolulu.

Fornander, A.
1969 *An Account of the Polynesian Race: Its Origin and Migrations*. Tokyo: Charles E. Tuttle Co., Inc.

1996 *Ancient History of the Hawaiian People*. Mutual Publishing, Australia.

Greene, L.W.
1993 A Cultural History of Three Traditional Hawaiian Sites on the West Coast of Hawaiʻi Island. United States Department of the Interior, National Park Service, Denver Service Center.

Handy, E.S.C., and E.G. Handy
1972 Native Planters in Old Hawai‘i: Their Life, Lore, and Environment. *B.P. Bishop Museum Bulletin* 233. Bishop Museum Press, Honolulu. (With M. Pukui)

1991 Native Planters in Old Hawaii: Their Life, Lore and Environment. *B.P. Bishop Museum Bulletin* 223. Honolulu: Department of Anthropology, Bishop Museum Press. (Revised Edition)

Haun, A., S. Kailihiwa, and D. Henry
2010 Archaeological Assessment Portions of TMK: (3) 6-8-01:37 and (3) 6-8-02:19 Land of Waikoloa, South Kohala District, Island of Hawai‘i. Haun and Associates Report 714-012610. Prepared for D W ‘Aina Le‘a Development, Waikoloa, Hawai‘i.

Haun, A., D. Henry, and K. McGuire
2003 Archaeological Inventory Survey DHHL Residential Development at Lālāmilo (TMK: 3-6-6-01:10, 54 & 77 and 3-6-6-04:12-17). South Kohala District, Island of Hawai‘i. Haun & Associates, Report 116-071203, Keaau, Hawaii. Prepared for PBR Hawaii, Hilo, Hawai‘i.

Henke
1929 A Survey of Livestock in Hawaii. University of Hawaii. *Research Publication* No. 5.

Hind, J.
n.d. *Kohala in 1873 and During Twenty Years Thereafter*. privately published.

Hommon, R.
1976 *The Formation of Primitive States in Pre-Contact Hawaii*. Ph.D. Dissertation (Anthropology), University of Arizona, Tucson. University Microfilms, Inc., Ann Arbor, Michigan.

1986 Social Evolution in Ancient Hawai‘i. IN Kirch, P. (editor), *Island Societies*: *Archaeological Approaches to Evolution and Transformation*:55–88. Cambridge: Cambridge University Press.

I‘i, J.
1963 *Fragments of Hawaiian History*. Bishop Museum Special Publication 70. Bishop Museum Press, Honolulu.

Jarves, J.
1847 History of the Hawaiian Islands: Embracing Their Antiquities, Mythology, Legends, Discovery by Europeans in the Sixteenth Century, Re-Discovery by Cook, With Their Civil, Religious and Political History, From the Earliest Traditionary Period to the Present Time. Honolulu: C.E Hitchcock.

1994 Phased Archaeological Inventory Survey, Hapuna Beach State Recreation Area Expansion Project: Phase III–Data Analyses and Final Report. Prepared for Harrison Associates. Honolulu.

Jensen, P., and B. Burgett
1991 Archaeological Inventory Survey, Proposed Kamakoa Water Reclamation Plant Site, Land of Waikoloa, South Kohala District, Island of Hawaii. PHRI Report 1047-042191. Prepared for Waikoloa Development Company.

Judd, B.
1832 “Early Days of Waimea, Hawaii” Fortieth Annual Report of the Hawaiian Historical Society for the year 1831 with papers read at the annual meeting February 29, 1932.

Juvik, S., and J. Juvik (editors)
1998 *Atlas of Hawaii*. Third Edition. University of Hawaii Press. Honolulu.

Kamakau, S.
1964 *Ka Po‘e Kahiko*: The People of Old. *B.P. Bishop Museum Special Publication* 51. Bishop Museum Press, Honolulu.

1976 The Works of the People of Old, *Na hana a ka Po‘e Kahiko*. *B.P. Bishop Museum Special Publication* 61. Bishop Museum Press, Honolulu.

1991 *Tales and Traditions of the People of Old*, *Nā Mo‘olelo a ka Po‘e Kahiko*. Bishop Museum Press, Honolulu.

1992 *Ruling Chiefs of Hawaii*. The Kamehameha Schools Press, Honolulu (Revised Edition).

Kelly, M.
1983 *Na Mala O Kona*: Gardens of Kona. A History of Land Use in Kona, Hawai‘i. *Departmental Report Series* 83-2. Department of Anthropology, B.P. Bishop Museum, Honolulu. Prepared for the Department of Transportation, State of Hawaii.

Kelly, M., and B. Nakamura
1981 A Progress Report on Background History of the Mudlane-Waimea-Kawaihae Road Corridor. IN *The Mudlane-Waimea- Kawaihae Archaeological Project: Interim Report,* P. Kirch and B. Clause, eds., pp. 26-56. Department of Anthropology, B.P. Bishop Museum, Honolulu.

Kennedy, J.
1987 An Archaeological Reconnaissance Survey at TMK:6-8-01:25,36-42, District of South Kohala, Ahupua‘a of Waikoloa, Island of Hawai‘i. Archaeological Consultants of Hawai‘i Inc. Prepared for Signal Puako Corp.

Kent, N.
1983 *Hawaii: Islands Under the Influence*. University of Hawai‘i Press, Honolulu.

Kirch, P.
1979 Marine Exploitation in Prehistoric Hawaii: Archaeological Investigations at Kalahuipua‘a, Hawai‘i Island. *Pacific Anthropological Records* No. 29. Department of Anthropology, B.P. Bishop Museum, Honolulu.

1984 *The Evolution of the Polynesian Chiefdoms*. New York: Cambridge University Press.

1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* Honolulu: University of Hawaii Press.

1990 Monumental Architecture and Power in Polynesian Chiefdoms: A Comparison of Tonga and Hawaii. *World Archaeology* 22(2).

2011 When did the Polynesians Settle Hawai‘i? A Review of 150 Years of Scholarly Inquiry and a Tentative Answer. *Hawaiian Archaeology* Vol. 12:3-26.

Kuykendall, R., and A. Day
1976 *Hawaii: A History; From Polynesian Kingdom to American Statehood*. Englewood Cliffs: Prentice-Hall, Inc.

Lyons, C.
1875 Land Matters in Hawaii. *Islander*, Honolulu.

Malo, D.
1903 Hawaiian Antiquities. *B.P. Bishop Museum Special Publication* 2. Bishop Museum Press, Honolulu.

Maly, K.
1999 *Nā Ala Hele Ma Kai O Kohala Hema*. Kumu Pono Associates Report HiAla-17K (043099). Prepared for DLNR-Forestry and Wildlife, Hilo.

Maly, K. and O. Maly
2002 *He Wahi Moʻolelo No Ka ʻĀina A Me Nā ʻOhana O Waikiʻi Ma Waikōloa (Kalana O Waimea, Kohala), A Me Ka ʻĀina Mauna:* A Collection of Traditions and Historical Accounts of the Lands and Families of Waikiʻi at Waikōloa (Waimea Region, South Kohala), and the Mountain Lands, Island of Hawaiʻi (TMK Overview Sheet 6-7-01). *Kumu Pono* Associates Report HiWaikii61-111202. Prepared for Waikiʻi Ranch Homeowner's Association, Kamuela, Hawaiʻi.

McEldowney, H.
1983 A Description of Major Vegetation Patterns in the Waimea-Kawaihae Region During the Early Historic Period. in Clark, J., and P. Kirch (1983).

Menzies, A.
1920 *Hawaii Nei, 128 Years Ago.* Edited by William F. Wilson. Honolulu: The New Freedom Press.

Moore, J., B. Ostroff, and J. Kennedy
2002 An Archaeological Inventory Survey Report for the Bridge ʻAina Lea Residential Golf Community Development Located at TMK:6-8-01:25, 36, 37, 38, 39 & 40 (pors.), in the Ahupuaʻa of Waikoloa, District of South Kohala, Island of Hawaiʻi (Revised). Prepared by Archaeological Consultants of the Pacific, Inc. Prepared for Bridge Capitol, Inc., Las Vegas, Nevada.

Nees, R. C., and S. S. Williams
2000 Archaeological Investigations for Defense Environmental Restoration Program for Formerly Used Defense Sites Waikoloa Maneuver Area (Formerly Camp Tarawa), Waikoloa, Island of Hawaiʻi. On file at the State Historic Preservation Division Library, Kapolei.

Oliver, D.
1961 *The Pacific Islands*. Honolulu: University of Hawaii Press.

Pogue, J.
1858[1978] *Mooleo Hawaii*. Hale Paipalapala Aupuni, Honolulu (Revised Edition).

Puakō Historical Society
2000 *Puakō An Affectionate History*. Creative Connections Publishing. Vancouver, B.C.

Pukui, M.
1983 ʻOlelo Noeau, Hawaiian Proverbs & Poetical Sayings. *B.P. Bishop Museum Special Publication* 71. Bishop Museum Press, Honolulu.

Pukui, M., S. Elbert, and E. Moʻokini
1974 *Place Names of Hawaii*. *Revised and Expanded Edition.* Honolulu: University of Hawaii Press, Honolulu.

Rechtman, R.
2003 Archaeological Assessment Study for a Proposed Potable Well (TMK:3-6-8-02:por. 17) Waikōloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi. Rechtman Consulting Report RC 0189. Prepared for Tom Nance Water Resource Engineering, Inc.

2005 Letter Report: Request for Determination of No Historic Properties Affected Associated With the Grading of a 2.0 MG Water Tank and Potable Well Site (Parker Well No. 3; TMK:3-6-8-01:44) Within Waikoloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi. Rechtman Consulting Report

RC-0262. Prepared for Greg Fukumitsu of Tom Nance Water Resources Engineering and the Mauna Lani Resort.

2006 Letter Report: Request for Determination of No Historic Properties Affected Associated With the Development of a New 1.0 MG Reservoir/Tank (Waikoloa 1200 Tank) Located in Waikoloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi (TMK 3-6-9-02:por. 19). Rechtman Consulting Report RC-0335. Prepared for Tom Nance Water Resources Engineering, Inc.

2008a Letter Report: Request For a Determination of No Historic Properties Affected Associated With the Development of Lālāmilo Well E and an Associated Access/Utility Corridor Within TMK: 3-6-6-01:02 in Lālāmilo Ahupuaʻa, South Kohala District, Island of Hawaiʻi. Rechtman Consulting Report RC-0575. Prepared for Tom Nance Water Resources Engineering, Inc.

2008b Letter Report: Request For a Determination of No Historic Properties Affected Associated With the Development of a New Water Well (Waikoloa Well #7) Located in Waikoloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi (TMK 3-6-8-02:por. 19). Rechtman Consulting Report RC-0406W. Prepared for Tom Nance Water Resource Engineering, Inc.

2008c Letter Report: Request For a Determination of No Historic Properties Affected Associated With the Development of Waikoloa Well No. 8 and an Associated Transmission/Access Corridor in Waikoloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi (TMK: 3-6-8-02:por. 18). Rechtman Consulting Report RC-0501. Prepared for Tom Nance Water Resource Engineering, Inc.

Rechtman R., and L. Kepaʻa

2014 Cultural Impact Assessment for the Proposed Lālāmilo Wind Farm Repowering Project, TMKs: (3) 6-6-01:002 (por.), 071, and (3) 6-8-01:001 (por.), Lālāmilo and Waikōloa *ahupuaʻa*, South Kohala District, Island of Hawaiʻi ASM Affiliates Report 21850. Prepared for Lālāmili Wind Company LLC, Hawī, Hawaiʻi.

Rechtman R., and K. Maly

2003 Cultural Impact Assessment for the Proposed Development of TMK:3-7-3-9:22, ʻOʻoma 2nd Ahupuaʻa, North Kona District, Island of Hawaiʻi, Volume I and II. Rechtman Consulting Report RC-0154. Prepared for Helber Hastert & Fee, Honolulu, Hawaiʻi.

Rechtman, R., and U. Prasad

2006 An Archaeological and Cultural Assessment Survey of Puʻu Neʻeneʻe Ranch (TMKs: 3-6-4-01:051, 053, 156, 157, 158, 159), Puʻukapu Ahupuaʻa, South Kohala District, Island of Hawaiʻi. Rechtman Consulting Report RC-0399. Prepared for Ken Russell, Kukulu Pono Construction LLC. Kamuela, Hawaiʻi.

Restarick, H.

1927 *Papers of the Hawaiian Historical Society. Issues 13-21: Historic Kealakekua Bay*. Kraus Reprint Co.

Rieth, T., and A. Morrison

2010 An Inventory Survey of the Proposed Kawaihae Road Bypass Corridors Kawaihae 1 & 2, ʻŌuli, Lālāmilo, and Waikoloa Ahupuaʻa, South Kohala, Hawaiʻi Island TMK (3) 6-01-01:03; 6-01-02:76, 78, 79, 80; 6-01-03:08, 09, 14, 16, 17, 25, 29, 41; 6-01-06:01, 02, 03; 6-02-01:19, 23, 51, 60, 64, 70; 6-02-02:06, 16; 6-06-01:02, 63, 999; 6-08-01:01, 61, 999 (Portions). IARII Report Number 200724. Prepared for EKNA Services, Inc. Honolulu.

Rosendahl, P.

1972 Archaeological Salvage of the Hapuna-Anaehoomalu Section of the Kailua-Kawaihae Road (Queen Kaahumanu Highway), Island of Hawaii. *Departmental Report Series* 72-5. Department of Anthropology, B.P. Bishop Museum, Honolulu.

1989 Identification of Historic Sites, CDUA Permit No. HA-2145, Land of Lalamilo, South Kohala District, Island of Hawaii (TMK:3-6-6-02:31). PHRI Report 561-060389. Prepared for Ms. Sandra Pechter Schutte, Attorney at Law, Roehrig, Roehrig, Wilson, Hara & Schutte.

1992a Archaeological Inventory Survey, Mauna Lani Well Sites, Land of Waikoloa, South Kohala District, Island of Hawai‘i (3-6-8-01: Por. 1). Letter Report 1221-022492. Prepared for Mani Lani Resort.

1992b Additional Historical Research, Mauna Lani Well Sites, Land of Waikoloa, South Kohala District, Island of Hawai‘i (3-6-8-01: Por. 1). Letter Report 1221-041492. Prepared for Mani Lani Resort.

2000 Archaeological Inventory Survey of TMK 6-8-01:22, Land of Waikoloa, South Kohala District, Island of Hawai‘i. Paul H. Rosendahl, Ph.D., Inc. Report 2017-072000. Prepared for White Sand Beach LP, Tinguely Development, Kailua-Kona, Hawai‘i.

Rosendahl, P., and L. Carter

1988 Excavations at John Young’s Housesite, Kawaihae Hawaii. Archaeology at Puukohola Heiau National Historic Site. *Western Archaeology and Conservation Center Publications in Anthropology* No. 47.

Schilt, R., and A. Sinoto

1980 Limited Phase I Archaeological Survey of Mahukona Properties, North Kohala, Island of Hawai‘i. B.P. Bishop Museum, Honolulu. Prepared for Belt, Collins and Associates.

Schilz, A., and K. Shun

1992 Final Report, Archaeological Survey and Evaluation, Puako Residential Golf Community, South Kohala, Hawaii Island, Golf Course Portion. Prepared by Ogden Environmental and Energy Services, Hawaii with contributions by H. Auna, H. Maybaum, and R. Schilz. Prepared for Puako Hawaii Properties, Kamuela, Hawaii. (Revised; original 1991).

Schmitt, R.

1977 *Historical Statistics of Hawaii*. Honolulu: University of Hawaii Press.

Sinoto, A. and G. Dashiell

2004 Archaeological Inventory Survey Amendment, Proposed Waikoloa Heights Subdivision, Waikoloa, South Kohala, Hawai‘i Island. (TMK:6-8-02:022)

Soehren, L.

1984 Archaeological Reconnaisance Survey of the Proposed Wind Farm Site, Lalamilo, South Kohala, Hawaii.

Tomonari-Tuggle, M.

1988 North Kohala: Perception of a Changing Community. A Cultural Resource Management Study. Prepared for Division of State Parks, Outdoor Recreation, and Historic Sites, Department of Land and Natural Resources, State of Hawaii.

U. S. Department of Agriculture

2013 USDA-NRCS Official Soil Series Description, Ainakea Series. Article available at: https://soilseries.sc.egov.usda.gov/OSD_Docs/A/Ainakea.html. Accessed at the U.S. Department of

U. S. House of Representatives

1917 *Radio Communication Hearings before the Committee on the Merchant Marine and Fisheries.* House of Representatives, Sixty-fourth Congress, Second Session on H. R. 19350, a Bill to Regulate Radio Communication. U. S. Government Printing Office, Washington.

Welch, D.
1983 Report 5: Archaeological Investigations in Section 2. In Archaeological Investigations of the Mudlane-Waimea-Kawaihae Road Corridor, Island of Hawai‘i: An Interdisciplinary Study of an Environmental Transect edited by Jeffrey T. Clark and Patrick V. Kirch, pp. 138- 180. Prepared for Department of Transportation, State of Hawai‘i. *Departmental Report Series* 83-1. Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu.

Wilkes, C.
1845 *Narrative of the United States Exploring Expedition During the Years 1838–1842, Under the Command of C. Wilkes, U.S.N.,* Volume 4. Philadelphia: Loa and Blanchard.

Williams, J.
1919 A Little Known Engineering Work in Hawaii. IN *Thrum's Hawaiian Almanac and Annual for 1919*. Thos. G. Thrum, Honolulu.

Wolfe, E., and J. Morris
1996 Geologic Map of the Island of Hawai‘i. Geologic Investigations Series Map 1-2524-A. U.S. Department of the Interior, U.S. Geological Survey.

Wolforth, T.
2000 An Archaeological Inventory Survey of Approximately 15 Acres for a Proposed Quarry and Related Activity at Parker Ranch Within Waikōloa Ahupua‘a, South Kohala District, Island of Hawai‘i (TMK: 6-8-01:001). Scientific Consultant Services, Inc., Report 216-1, Honolulu, Hawai‘i. Prepared for William L. Moore Planning, Hilo and Parker Ranch, Waimea.

Yent, M.
1991 Results and Recommendations of the Archaeological Reconnaissance Survey conducted at Hapuna Beach State Park, South Kohala, Hawaii (TMK: 6-6-02:31). Prepared for Division of State Parks, Department of Land and Natural Resources.

Yent, M., and A. Griffin
1978 Archaeological Investigations: Hapuna Beach State Park Recreation Area, Lalamilo, South Kohala, Island of Hawaii (TMK:6-6-02:35). Prepared for Division of State Parks, Department of Land and Natural Resources.