

# An Archaeological Assessment of the Arion South Point Photovoltaic Project

TMK: (3) 9-3-004:040 (por.)

Kea'ā 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a  
Ka'u District  
Island of Hawai'i

DRAFT VERSION



*Prepared By:*  
Joshua Gastilo, M.A.  
and  
Matthew R. Clark, M.A.

*Prepared For:*  
Nick Azari, Ph.D.  
Arion Energy  
7388 S. Revere Parkway,  
Suite 803  
Centennial, CO 80112

March 2019



Archaeology • History • Anthropology • Architectural History

Hilo Office: (808) 969-6066 Fax: (808) 443-0065  
507-A E. Lanikaula Street, Hilo, HI 96720

Honolulu Office: (808) 439-8089 Fax: (808) 439-8087  
820 Milliani Street, Suite 700, Honolulu, HI 96813

ASM Project Number 31600.00



# **An Archaeological Assessment of the Arion South Point Photovoltaic Project**

TMK: (3) 9-3-004:040 (por.)

Kea‘ā 1st and 2nd Ahupua‘a

Ka‘ū District

Island of Hawai‘i





## EXECUTIVE SUMMARY

At the request of Nick Azari, Ph.D., of Arion Energy, ASM Affiliates conducted an Archaeological Inventory Survey (AIS) of a roughly 3-acre area portion of TMK: (3)-9-3-004:040 for the proposed construction of a South Point Photovoltaic (PV) system in Kea‘ā 1<sup>st</sup> and 2<sup>nd</sup> Ahupua‘a, Ka‘ū District, Island of Hawai‘i. The South Point Photovoltaic (PV) Project proposed by Arion Energy, part of the first phase of the Hawaiian Electric Light Company’s (HELCO) Community-Based Renewable Energy program for Hawai‘i Island, will include the installation of 14 rows of PV panels within a roughly 250-meter by 80-meter (820-foot by 262-foot) area of previously grubbed pasture located in the northeastern corner of the privately-owned subject parcel.

No historic properties were identified within the study area as a result of the current survey, which was undertaken in accordance with Hawai‘i Administrative Rules 13§13–284, 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§13–276. According to 13§13-284-5(b)(5)(A) when no archaeological resources are discovered during an archaeological inventory survey the production of an Archaeological Assessment report is appropriate. Compliance with the above standards is sufficient for meeting the historic preservation review process requirements of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawai‘i Planning Department.

Given that there were no archaeological resources identified within the current study area it is concluded that the Arion South Point Photovoltaic Project will not impact any known historic properties. Therefore, the determination of effect for the proposed project is “no historic properties affected.” In the unlikely event that significant archaeological resources are discovered during the proposed ground disturbing activity associated with the development of the photovoltaic system, work will cease in the area of the discovery and DLNR-SHPD will be contacted pursuant to HAR 13§13-280-3.



## CHAPTERS

	<b>Page</b>
<b>1. INTRODUCTION .....</b>	<b>5</b>
STUDY AREA DESCRIPTION .....	5
<b>2. BACKGROUND.....</b>	<b>12</b>
CULTURE-HISTORICAL CONTEXT.....	12
Generalized Model of Hawaiian Prehistory .....	13
The <i>Ahupua'a</i> Land Management System .....	13
The Ruling Chiefs of Ka'ū .....	14
History After Contact .....	15
Early Missionaries in Ka'ū.....	17
Population Decline in Ka'ū .....	19
The <i>Māhele 'Āina</i> of 1848.....	19
The Mauna Loa Flow of 1868.....	21
The Lands in the Vicinity of the Current Study Area During the Twentieth Century .....	23
PREVIOUS ARCHAEOLOGICAL STUDIES .....	29
<b>3. STUDY AREA EXPECTATIONS.....</b>	<b>31</b>
<b>4. FIELDWORK.....</b>	<b>32</b>
FIELD METHODS .....	32
FIELD RESULTS .....	32
<b>5. DETERMINATION OF EFFECT AND RECOMMENDATIONS.....</b>	<b>34</b>
<b>REFERENCES CITED.....</b>	<b>35</b>

## FIGURES

	<b>Page</b>
1. Study area location.....	6
2. Tax Map Key (3) 9-3-004 with the current study area (a portion of Parcel 040) shaded in red. ....	7
4. Lava flows in the vicinity of the current study area.....	8
5. Soil classifications in the vicinity of the current study area.....	9
6. Fence line along the western boundary of the current study area, view to the south.....	9
7. Eastern portion of the current study area, view to the north (the line of vegetation to the right of the photograph marks the edge of the 1868 lava flow).....	10
8. Gate that provides access from the study area to the existing HELCO powerline line maintenance road, view to the north.....	10
9. 2007 Google Earth aerial image of the study area (outlined in red) with the line of pushed vegetation circled in yellow.....	11
10. Close-up of the line of pushed vegetation, view to the east.....	11

11. Portion of Hawai‘i Registered Map No. 2060 (Donn 1901) showing the location of the current study area within Kea‘ā 1<sup>st</sup> and 2<sup>nd</sup> *ahupua‘a*. ..... 12

12. Cartographic sketch of Ka‘ū District indicating the various land use zones. .... 14

13. TMK: (3) 9-3-004 showing the study area shaded in red, nearby LCAws. outlined in blue, and Grant 1371 outlined in green. .... 20

14. Portion of Hawai‘i Registered Map No. 1409 (Compiled by Brown 1885) showing the grant parcels sold in the vicinity of the current study area. .... 22

Figure ..... 25

17. Detail of the Emerson (1903) map showing the location of the current study area relative to the 1868 lava flow and Haunakalili. .... 26

22. Prior archaeological studies conducted in the vicinity of the current study area. .... 30

23. Location of Haunakalili pit relative to the current study area. .... 32

24. Interior of Haunakalili pit, view to the northwest from the southeastern edge. .... 33

25. Southern wall surrounding Haunakalili pit adjacent to the fenceline defing the northern boundary of the study area, view to the north. .... 33

26. Southeastern corner of the wall surrounding Haunakalili pit, view to the northeast. .... 34



## 1. INTRODUCTION

At the request of Nick Azari of Arion Energy, ASM Affiliates (ASM) conducted an Archaeological Inventory Survey (AIS) of a roughly 3-acre portion of TMK: (3) 9-3-004:040 (por.) for the proposed development of a community-based renewable energy project in Kea‘ā 1st and 2nd Ahupua‘a, Ka‘ū District, Island of Hawai‘i (Figures 1 and 2). The South Point Photovoltaic (PV) Project proposed by Arion Energy, part of the first phase of the Hawaiian Electric Light Company’s (HELCO) Community-Based Renewable Energy program for Hawai‘i Island, will include the installation of 14 rows of PV panels within a roughly 250-meter by 80-meter (820-foot by 262-foot) area of previously grubbed pasture located in the northeastern corner of the privately-owned subject parcel (Figure 3). The PV site will be accessed from a gated maintenance road that follows an existing HELCO powerline and easement across several privately-owned parcels between Māmalahoa Highway and South Point Road, and passes through the northeastern corner of TMK: (3) 9-3-004:040 (por.) adjacent to the proposed PV site. A new riser pole and transformer will also be installed at the PV site to connect the solar array to the existing powerline.

No historic properties were identified within the study area as a result of the current survey, which was undertaken in accordance with Hawai‘i Administrative Rules 13§13–284, 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§13–276. Compliance with the above standards is sufficient for meeting the historic preservation review process requirements of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawai‘i Planning Department. According to 13§13-284-5(b)(5)(A) when no archaeological resources are discovered during an archaeological inventory survey the production of an Archaeological Assessment report is appropriate. This report provides a study area description, a detailed culture-historical background, a discussion of prior archaeological studies within the vicinity of the current study area, and the results of the current field investigation of the study area.

### STUDY AREA DESCRIPTION

The current study area is located 371 meters *makai* of Māmalahoa Highway (Highway 11) and 712 meters west of the South Point Road within in Kea‘ā 1st and 2nd Ahupua‘a, Ka‘ū District, Island of Hawai‘i (see Figures 1 and 2). The study area includes a 3-acre portion of a 207.75-acre parcel (TMK: (3) 9-3-004:040) situated at elevations ranging from 580 meters (1,900-feet) and 595 meters (1,950-feet) above sea level. The study area is located within Kīpuka Mana o Ka Lili, a *kīpuka* (an area of land surrounded by a younger lava flow) that formed as a result of an 1868 eruption of Mauna Loa that sent ‘a‘ā lava from its source at Pu‘uhou (located *mauka* of the study area in Kahuku Ahupua‘a) to the coast at Ka Lae (South Point) below Pali o Mamalu and Pali‘okūlani (Figure 4). Kīpuka Mana o Ka Lili was named for a nearby pit crater (situated just to the north of the study area), called Haunakalili, that was partially filled in as a result of the flow. The older lavas that make up the substrate within the *kīpuka* consist of *pāhoehoe* flows from eruptions of Mauna Loa that occurred 3,000 to 5,000 years ago (Sherrod et al. 2007). The soils within the *kīpuka* are classified as Kiolakaa medial loam on 2 to 10 percent slopes (Figure 5). These soils, which are formed in volcanic ash overlying *pāhoehoe* lava, typically extend 25 to 35 inches to bedrock and become more cobbly with depth (Soil Survey Staff 2018). The study area receives a mean annual rainfall of 1,270 millimeters (50 inches) with much of the rain occurring during the wetter winter months of November to March (Giambelluca et al. 2013). Air temperature in the vicinity the study area ranges from 18 to 21 degrees Celsius (64 to 70 degrees Fahrenheit) throughout the year (Giambelluca et al. 2014).

The entire study area has been previously grubbed and is currently used as pasture. Fence lines delineate the northern and western boundaries of the study area (Figure 6), the eastern boundary is marked by the edge of an 1868 lava flow (the ‘a‘ā lava flow is not actively grazed and is currently covered in dense vegetation; Figure 7), and the southern boundary is an arbitrary line that extends through the pasture between the eastern and western boundaries, marking the extent of the 3 acres. A gate in the northern fence line provides access from the existing HELCO powerline line maintenance road to the study area (Figure 8). A review of aerial imagery indicates that the most recent clearing of vegetation from this area took place sometime just prior to 2007. A berm of decaying plant material that extends north/south through the middle of the study area (parallel to the western fence line) indicates where the vegetation cleared during the most recent grubbing episode was pushed to (Figure 9). This line of plant material is currently covered by a thick growth of weeds consisting primarily of gunpowder (*Trema orientalis*) and Christmas-berry (*Schinus terebinthifolius*) trees (Figure 10). A thick growth of Christmas-berry along the northern and western boundaries of the study area marks the edge of the 1868 lava flow. A few large ‘ōhi‘a (*Metrosideros polymorpha*) that were left in place during the most recent grubbing of the study area are scattered throughout the pasture, which is covered in low grass.

1. Introduction

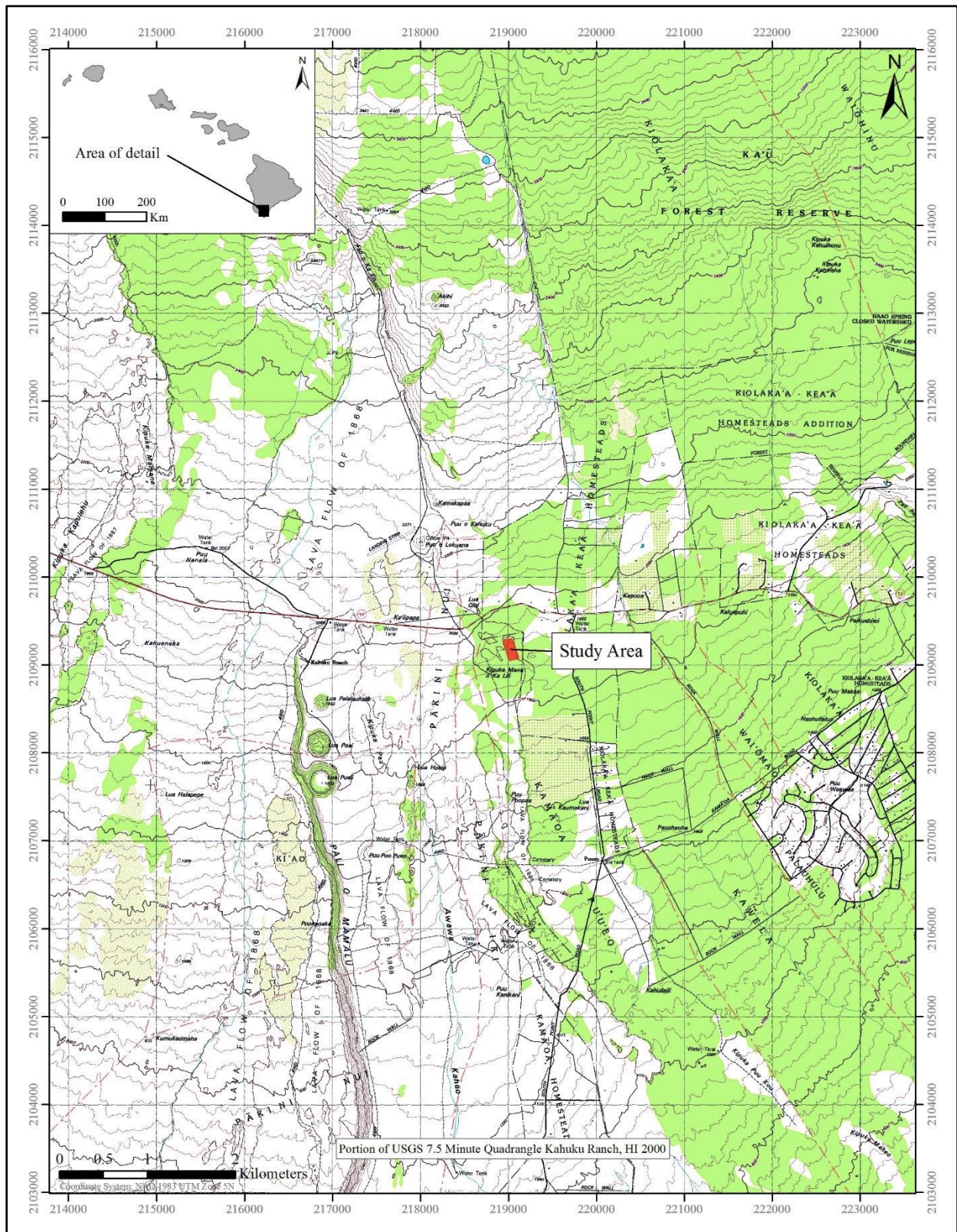


Figure 1. Study area location.



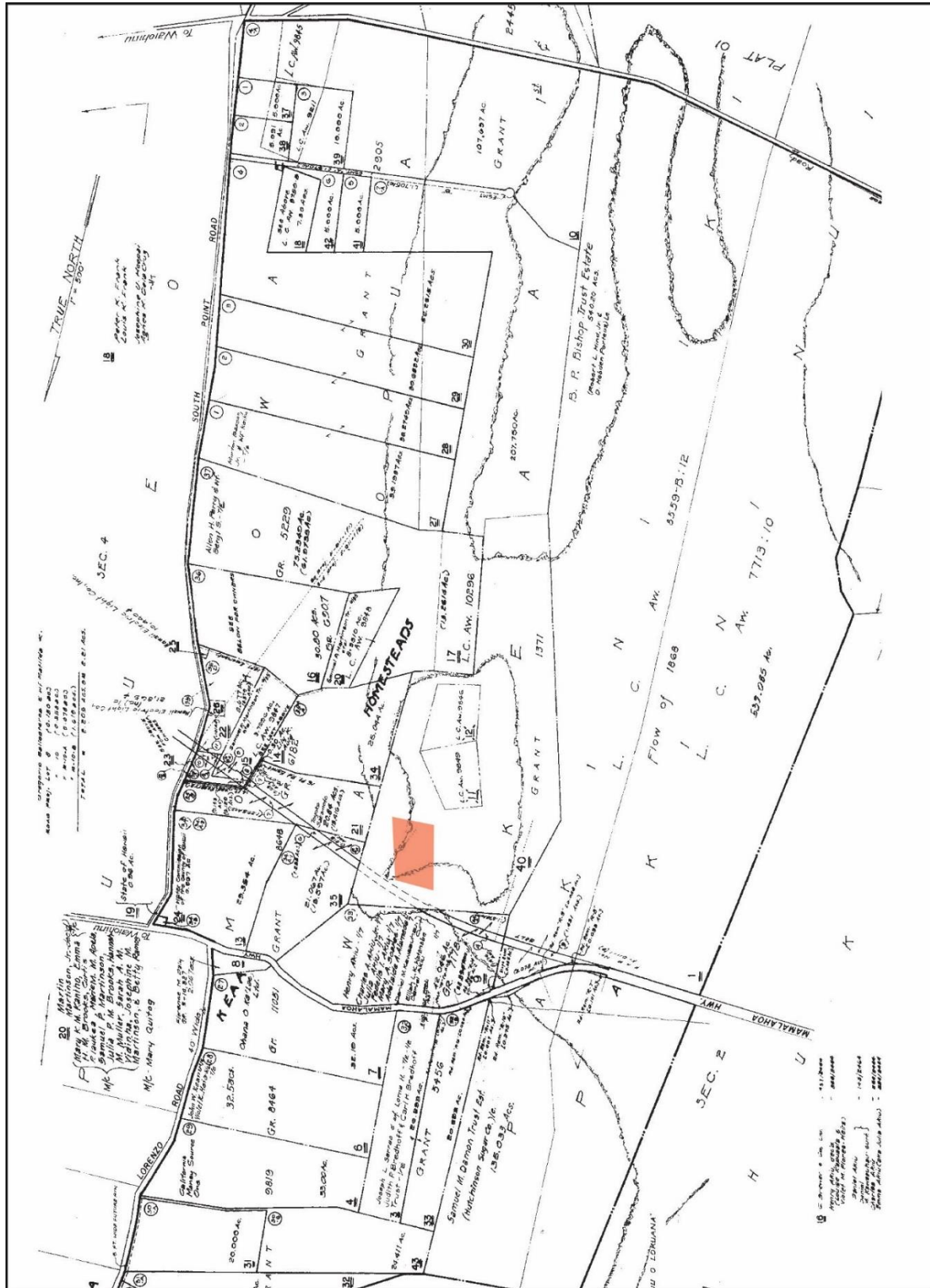


Figure 2. Tax Map Key (3) 9-3-004 with the current study area (a portion of Parcel 040) shaded in red.

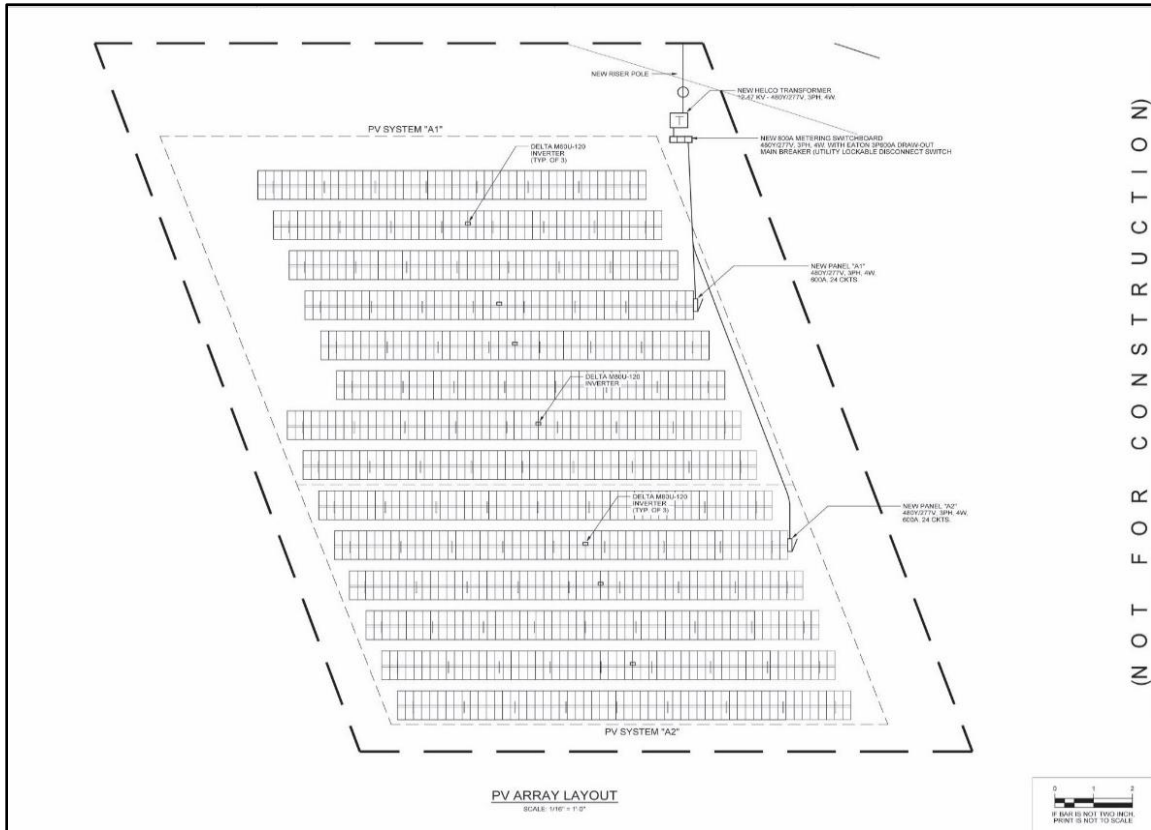


Figure 3. Arion Energy’s development plans with the study area outlined in bold dashed lines.

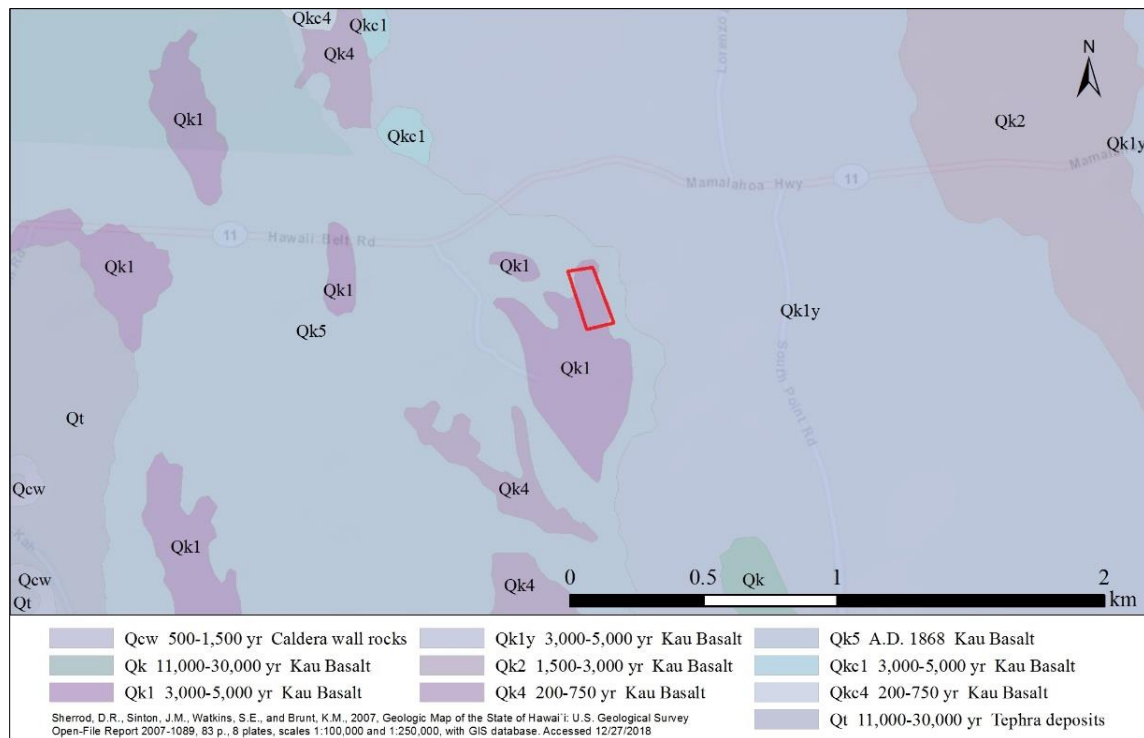


Figure 4. Lava flows in the vicinity of the current study area.



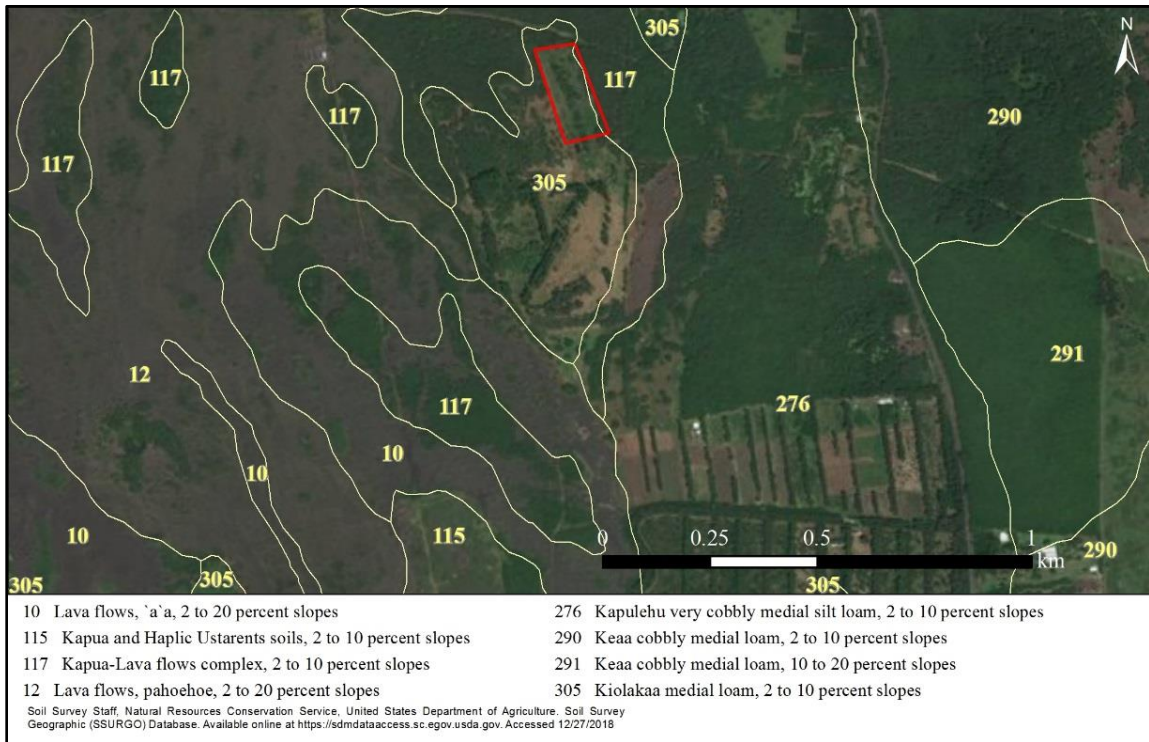


Figure 5. Soil classifications in the vicinity of the current study area.



Figure 6. Fence line along the western boundary of the current study area, view to the south.





Figure 7. Eastern portion of the current study area, view to the north (the line of vegetation to the right of the photograph marks the edge of the 1868 lava flow).



Figure 8. Gate that provides access from the study area to the existing HELCO powerline line maintenance road, view to the north.



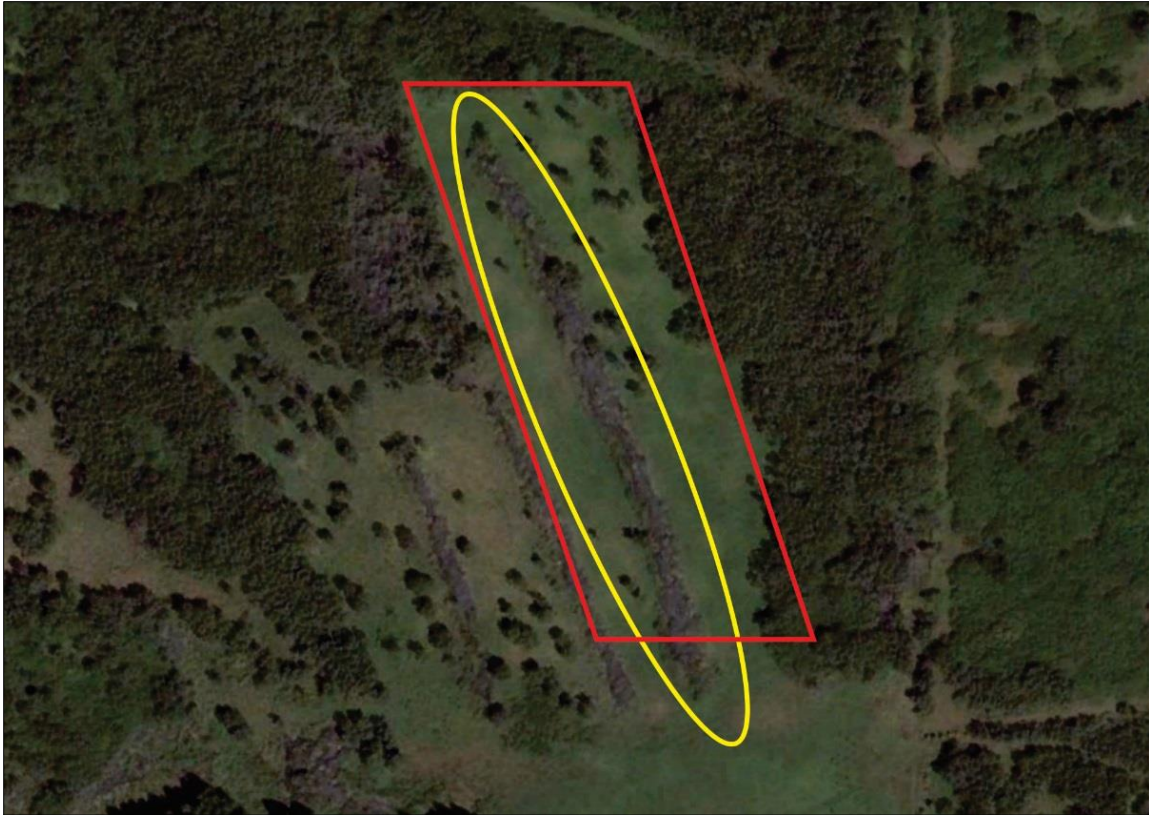


Figure 9. 2007 Google Earth aerial image of the study area (outlined in red) with the line of pushed vegetation circled in yellow.



Figure 10. Close-up of the line of pushed vegetation, view to the east.



## 2. BACKGROUND

To generate a set of expectations regarding the nature of archaeological resources that might be encountered within the current study area, and to establish an environment within which to assess the significance of any such resources, a general culture-historical context for the Ka‘ū region that includes specific information regarding the known history of Kea‘ā 1st and 2nd Ahupua‘a and the study area vicinity is presented. This is followed by a discussion of relevant prior archaeological studies conducted near the study area.

### CULTURE-HISTORICAL CONTEXT

The current study area consists of roughly 3 acres located near the southern tip of the Island of Hawai‘i in the District of Ka‘ū, the largest and southernmost of the six traditional districts (*moku*) on the Island of Hawai‘i. The study area is situated within the *ahupua‘a* of Kea‘ā 1<sup>st</sup> and 2<sup>nd</sup> (Figure 11). Many of the historical and modern maps reviewed for this study do not demarcate these *ahupua‘a*, but instead portray them as a part of Pakini Iki or Kamā‘oa Ahupua‘a (see Figure 1). When Kea‘ā is depicted on maps, it is represented as a single *ahupua‘a* rather than two distinct *ahupua‘a*. This is largely because the Kea‘ā 1<sup>st</sup> and 2<sup>nd</sup> became Government lands during the *Māhele ‘Āina* (Land Division) of 1848, and the boundaries of the *ahupua‘a* were never officially surveyed.

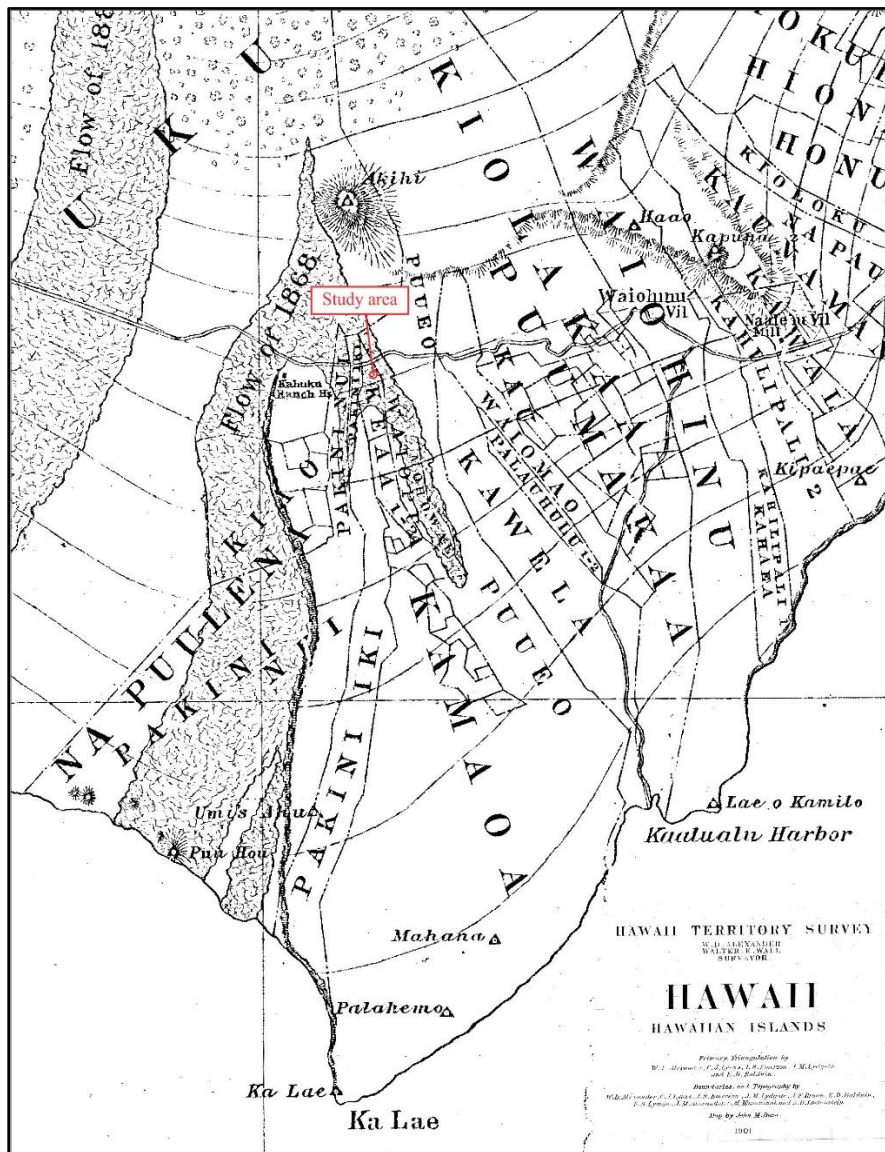


Figure 11. Portion of Hawai‘i Registered Map No. 2060 (Donn 1901) showing the location of the current study area within Kea‘ā 1<sup>st</sup> and 2<sup>nd</sup> *ahupua‘a*.



## Generalized Model of Hawaiian Prehistory

The generalized cultural sequence that follows is based on Kirch's (1985) model, but is amended to include recent revisions offered by Kirch (2011). The conventional wisdom has been that after the first inhabitants of Hawai'i Island arrived, they focused habitation and subsistence activities on the windward side of the island (Burtchard 1995; Hommon 1986; Kirch 1985). Recent re-evaluation and syntheses of genealogical, oral historical, mythological, and radiometric data by Kirch (2011) and others (Athens et al. 2014; Duarte 2012; Wilmshurst et al. 2011) have convincingly argued that Polynesians may not have arrived in the Hawaiian Islands until at least A.D. 1000, and expanded rapidly thereafter. The implications of this on the previously 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, the Expansion Period to A.D. 1350 to 1650.

The initial settlement of Hawai'i is believed to have originated from the southern Marquesas Islands. The Settlement Period was a time 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, 2010). According to Fornander (1969), Hawaiians brought from their homeland certain universal Polynesian customs: the major gods Kāne, Kū, and Lono; the *kapu* (restrictions) system of law and order; cities of refuge; the *'aumakua* concept; various epiphenomenal beliefs; and the concept of *mana*.

As time passed, a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites of the Developmental 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. Few areas in Hawai'i contain quality basalt for adze production. Mauna Kea on the island of Hawai'i was 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 were status items worn by individuals of high rank, which indicates recognition of status differentiation (Kirch 1985). As the population expanded in the Hawaiian Islands so did social stratification, which was accompanied by major socioeconomic changes and intensive land modification. Once most of the ecologically favorable zones of the windward and coastal regions of the major islands were settled, the more marginal leeward areas were developed. Migrations to Hawai'i from the Marquesas and Society Islands may have continued throughout the Expansion Period (Kirch 1985).

## The *Ahupua'a* Land Management System

The first settlers of Ka'ū initially established a few small communities near sheltered bays with access to fresh water. The communities shared extended familial relations, and there was an occupational focus on the collection of marine resources. The Hawaiian population expanded rapidly throughout the first few centuries of the new millennium (Kirch 2011), and by the fourteenth century inland elevations were being turned into dryland agricultural fields. By the fifteenth century, residency in the uplands was becoming permanent, and there was an increasing separation of the chiefly class from the common people. During the sixteenth century the population stabilized and the *ahupua'a* land management system was established as a socioeconomic unit (Ellis 2004; Handy and Handy 1991; Kamakau 1992; Kelly 1983; Tomonari-Tuggle 1985).

*Ahupua'a*, generally speaking, are wedge-shaped subdivisions of land that radiate out from the center of the island and extend from the mountains into the sea. Their boundaries are often defined by the topography of the land and geological features. In these land units the native tenants tended fields and cultivated the crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* were observed, the common people (*maka'āinana*), who lived in a given *ahupua'a* had access to most of the resources from the mountain slopes to the ocean. These access rights were almost uniformly tied to residency of a particular land, and earned as a result of taking responsibility for stewardship of the natural environment and supplying the needs of the *ali'i* (see Kamakau 1992; Malo 1951).

Entire *ahupua'a*, or smaller portions of the land called *'ili*, were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *ali'i-'ai-ahupua'a* (chief who controlled the *ahupua'a* resources). The *ali'i-'ai-ahupua'a* in turn answered to an *ali'i-'ai-moku* (chief who claimed the abundance of the entire district). Thus, *ahupua'a* resources supported not only the *maka'āinana* and *'ohana* (families) who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resource management planning.

## 2. Background

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).

Handy and Handy (1991) provide a cartographic sketch indicating the various Hawaiian land use zones in the District of Ka'ū (Figure 12). This construct is based on the Hawaiian terms for the major vegetation zones that are used to define and segregate space within the region's *ahupua'a*. The zones are bands roughly parallel to the coast that correspond with changes in elevation and rainfall. The current study area lies within the *kula uka* zone. Land use in *kula uka* concentrated primarily on agricultural pursuits including the cultivation of sweet potato, sugarcane, and taro. As Handy and Handy (1991:555) relate:

...beyond the *kula kai* (the lowest habitable zone) were the dwellings of the upland slopes (*ko kula uka*), less accessible to the sea, but increasingly favorable for gardening. In addition to sweet potato, dry-land taro of the variety called *Paua* was planted, and sugar cane flourished...

These resource zones were not uniformly fixed to specific altitudes. Typically, the eastern (windward) half of Hawai'i Island receives more frequent and heavier precipitation at lower elevations than the western (leeward) half of the island. In the Ka'ū region, the shoulder of Mauna Loa cuts off the trade winds and prevents heavy precipitation from reaching Kona unimpeded. The current study area is situated near this transition from the wet to the dry side of the island, but typically receives ample rainfall for dry-land agricultural to have flourished in the past. The lands in the vicinity of the study area were once likely cultivated (prior to the 1868 lava flow) as part of an extensive field system that has been documented archaeologically on nearby lands, and was written about by early Western explorers to the area.

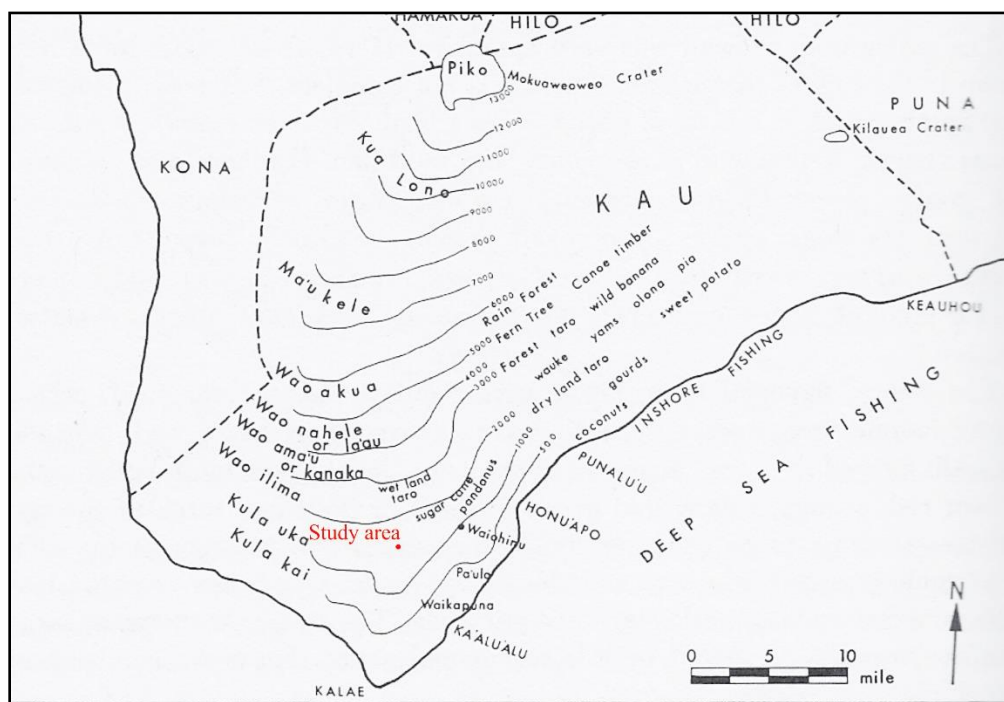


Figure 12. Cartographic sketch of Ka'ū District indicating the various land use zones.

### The Ruling Chiefs of Ka'ū

By the seventeenth century large areas of Hawai'i Island (*moku 'āina* – districts) were controlled by a few powerful *ali'i 'ai moku*, and the annual *Makahiki* rituals were beginning to become codified in the Hawaiian political system (Kirch 2012:252–253). From the story of 'Umi (Kamakau 1992:1–21) we learn that Imaikalani was the ruler of Ka'ū at this time. Around A.D. 1600 'Umi a Līloa was able to conquer all of the districts of the island, thus unifying Hawai'i under his rule. Imaikalani, who was a powerful warrior, resisted 'Umi, and in his younger days 'Umi was never able to defeat him. The war between these two lasted for a long time. As Imaikalani got older he became blind, but was still noted for his strength and skill in battle. As Kamakau explains:

Many chiefs who had fought against him were destroyed. He was skilled in striking left or striking right, and when he thrust his spear (*pololu*) to the right or to the left it roared like thunder, and rumbled like an earthquake. When he struck behind him, a cloud of dust rose skyward as though in a whirlwind. ‘Umi-a-Liloa feared I-mai-ka-lani. Although he was blind and unable to see, his hearing was keen. He had pet ducks that told him in which direction a person approached, whether from in front, at the back, or on either side. All depended on the cries of the birds. (1992:18)

Only through the skill and cunning of Pi‘imaiwa‘a, ‘Umi’s lifelong friend, was Imaikalani defeated. Pi‘imaiwa‘a studied Imaikalani until he knew every angle of the Ka‘ū chief’s strength and marvelous skill, and then he killed the two men who led Imaikalani on either side, the forty men who carried his spears, and all of his pet ducks. When Imaikalani was alone and helpless, Pi‘imaiwa‘a killed him and Ka‘ū became ‘Umi a Līloa’s (Kamakau 1992).

In ancient times the people of Ka‘ū labored willingly for their chiefs, but when the chiefs were abusive, the people rebelled. For this reason the district earned the name Ka‘ū Mākaha, or Fierce Ka‘ū (Kelly 1980). Malo (1951) names three chiefs of Ka‘ū who were slain by their subjects: Koihala, Kohaikalani, and Halaea. Three different stories tell of the abuses that led to the deaths of these chiefs (see Kelly 1980:1–6). One chief was stoned to death because he abused the people who served him and provided him with food; another, who regularly demanded the entire catch of the fishermen in Ka‘ū, drowned when his canoe was purposely overloaded with fish by the vengeful fishermen. The third, worked his people too long and unreasonably hard while building a *heiau* inland of Nīnole. He was tricked into standing beneath a large log that the people were pulling up a steep hill, which they then released, crushing the abusive chief.

One of the last great ruling chiefs from Ka‘ū was Kalani‘ōpu‘u (Kamehameha I’s uncle). During the first part of the eighteenth century Kalani‘ōpu‘u inherited the position of Ka‘ū’s high chief from his father, Kalaninui‘iamamao. 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. In 1754, after many bloody battles, Kalani‘ōpu‘u defeated Keaweopala in South Kona and became ruler of Hawai‘i Island (Kamakau 1992:78), a position he would hold for nearly thirty years. Kalani‘ōpu‘u was the reigning chief of the island during the first recorded visit to Hawai‘i by European explorers in 1778.

## History After Contact

The arrival of foreigners in Hawai‘i marked the end of the Precontact Period and the beginning of the Historic Period. British explorer Captain James Cook and his crew on board the ships the H.M.S. *Resolution* and *Discovery* first arrived in the Hawaiian Islands on January 18, 1778, staying for less than a month (visiting Kaua‘i and Ni‘ihau) before proceeding north toward the Bering Strait. Upon returning to the Hawaiian Islands in January of 1779, Cook and his men visited the southern tip of Hawai‘i Island for the first time; Cook recorded a large village on the southern point and he met with some of the inhabitants who brought supplies to his ships. He was not overly impressed with the size of the pigs, nor the amount of fruit and vegetables offered, and he noted that “the Country did not seem capable of producing many of either having been destroyed by a Volcano...” (Beaglehole 1967:486). Lieutenant King, who accompanied Cook on the voyage, noted that Ka‘ū District, despite its desolate appearance, seemed more populous than the neighboring district of Puna; Kelly (1969) estimated that the Ka‘ū District had a population of between 10,000 and 13,500 at the time European contact.

After leaving South Point, Cook anchored at Kealakekua Bay in South Kona where he exchanged gifts with Kalani‘ōpu‘u (Kamakau 1992). In February 1779, Cook set sail for Maui; however, a severe storm off the coast of Kohala damaged a mast and they were forced to return to Kealakekua Bay. While back at the bay a skirmish broke out on the shores of Ka‘awaloa over a stolen skiff, and Captain Cook was killed (King 1784; Kuykendall and Day 1976; Sahlins 1985; Samwell 1786).

Around 1780, after the *Resolution* and *Discovery* had come and gone, 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 I. Kamehameha and a few other chiefs were concerned about their land claims, which Kiwala‘ō did not seem to honor (Fornander 1969; Kamakau 1992:199). In 1781 a rebel Puna chief named Imakakolo‘a led an uprising against Kalani‘ōpu‘u, but was defeated in Puna by Kalani‘ōpu‘u’s superior forces. Following the defeat, Imakakolo‘a 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 as an offering; however, it was Kamehameha who “grasped the body of I-maka-koloa 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 Kalani‘ōpu‘u died in April of 1782, 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 John Papa ‘Ī‘ī (1963), nearly ten years of almost continuous warfare followed the death of Kiwala‘ō while 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‘ukohola in Kawaihae, which was to be dedicated to the war god Kūka‘ilimoku (Fornander 1969). The near constant warring on the island of Hawai‘i during this decade of turmoil and strife undoubtedly had an effect on the people in Keoua’s home district of Ka‘ū. Westervelt (1916) tells of a battle in ca. 1790 when Kamehameha routed Keōua at Waimea and Hāmākua and then sent men to attack Ka‘ū. As Keōua attempted to return to Ka‘ū to stop Kamehameha’s warriors from ravaging his home district, nearly 400 of his soldiers and numerous women and children were killed by the sudden eruption of Kīlauea Volcano (Fornander 1969). Kamehameha’s prophets said that this eruption was the favor of the gods who rejoiced at his building of Pu‘ukohola Heiau. According to Westervelt, “The people said it was proof that Pele had taken Kamehameha under her special protection and would always watch over his interests and make him the chief ruler” (1916:146). Despite the loss of men to the volcano, Keōua continued to resist Kamehameha.

In 1791 Kamehameha’s forces, under the leadership of Ka‘iana attacked Keōua’s forces in Ka‘ū. Unable to defeat Keōua in battle, Kamehameha resorted to trickery. Following the skirmishes with Ka‘iana, Keōua stayed in Ka‘ū, living “*mauka* in Kahuku with his chiefs and the warriors of his guard” (Kamakau 1992:155). When Pu‘ukohola Heiau was completed in the summer of 1791, Kamehameha sent his two counselors, Keaweaeulu and Kamanawa, to Keōua to offer peace. Keōua was enticed to the dedication of the Pu‘ukohola Heiau by this ruse and 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 1792 (Greene 1993).

Demographic trends during the early Historic Period indicate that the Hawaiian population declined in some areas due to war and disease, yet increased in others—with relatively little change in material culture (Rechtman and Maly 2003). There was a continued trend toward craft and status specialization, intensification of agriculture, *ali‘i* controlled aquaculture, upland residential sites, and the enhancement of traditional oral history. 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 as an increasing numbers of foreign vessels began to arrive (Kent 1983; Kirch 1985). Foreigners introduced the concept of trade for profit, and by the end of the 1700s, Hawai‘i saw the beginnings of a market system economy (Kent 1983). This marked the end of an era of uniquely Hawaiian culture.

Archibald Menzies, a botanist who arrived in the Hawaiian Islands with Capt. George Vancouver, visited the Ka‘ū District in 1794 during an attempt to climb Mauna Loa. Menzies took a canoe from Kealakekua Bay, stopping first at Manukā and then at Pakini Village near South Point, where he left his canoe and set out overland. Menzies (1920) noted that when Hawaiians visited the eastern side of the island by this southern route, they typically traveled by canoe as far as Pākini, where they would leave their canoe and continue eastward by land, reclaiming the canoe on the return trip. This journey, however, required that the traveler first climb a steep precipice near the coast known as Pali o Kalani. Menzies (1920:181–183) reported that:

...On gaining its summit [of Pali o Kalani], which was not an easy task, an extensive tract of the most luxuriant pasture we had yet seen amongst these islands rushed at once upon our sight, extending itself from the south point to a considerable distance inland...

From the summit of this bank we pursued a path leading to the upper plantations in a direct line towards Mauna Loa, and as we advanced the natives pointed out to us on both sides of our path, places where battles and skirmishes were fought in the late civil wars between the adherents to the present king [Kamehameha I] and the party of Keoua, who was king of the island in Captain Cook’s time. Kamehameha’s warriors were headed by Kaiana, who at that time made free use of firearms, which obliged Keoua’s warriors to entrench themselves by digging small holes in the ground, into which they squatted flat down at the flash of the musquets. Many of these little entrenchments were still very conspicuous and they were pointed out to us by natives with seeming satisfaction, as it was to them a new method of eluding the destructive powers of firearms on plain ground. Here then we

behold the first beginnings of fortifications amongst them. We also see that the same mode of fighting naturally begets the same mode of defense in every part of the world. It was in these wars that Kaiana by his knowledge of firearms gained so much ascendancy on the island and became so powerful a chief. We continued our ascent through a rich tract of land which appeared to have laid fallow or neglected ever since these wars, till we came to a grove of kukui trees, and under their shade we stopped to rest and refresh ourselves in the heat of the day.

From this point, Menzies and his companions continued on a narrow winding path five or six miles from the shore, which he described as “the public road leading to the east end of the island” (Menzies 1920:184). They stopped for the night at the village of Kīʻōlokū on a plantation belonging to the chief Keaweaheulu before continuing their journey to Mauna Loa the next day.

By 1796, with the aid of foreign weapons and advisors, Kamehameha conquered all of the island kingdoms except Kaula. In 1810, when Kaumualiʻi of Kauai gave his allegiance to Kamehameha, the Hawaiian Islands were unified under a single leader (Kuykendall and Day 1976). Kamehameha would go on to rule the islands for another nine years. He and his high chiefs participated in foreign trade but continued to enforce the rigid *kapu* system.

Kamehameha died in the year 1819 at his residence of Kamakahonu in Kailua-Kona, and with his passing his heir Liholiho was given the name of Kamehameha II. Following the death of a prominent chief, it was customary to remove the regular *kapu* that maintained social order, the separation of men and women, as well as 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*. The new ruler and *kahuna* should have re-established *kapu* and restored social order; but at this point in history traditional customs were not followed.

Immediately upon the death of Kamehameha I, Liholiho was sent away to Kawaihae to keep him safe from the impurities at Kamakahonu brought about by 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 the 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-aliʻi consented to the free eating and it was accepted on Kauai. (Kamakau 1992:225)

Liholiho’s cousin, Kekuaokalani, caretaker of the war god Kūkaʻilimoku, revolted because he was distressed by the socioreligious turn of events. The forces of Liholiho and Kekuaokalani met in battle during December of 1819 at Kuamoʻo in North Kona. Kekuaokalani’s forces were defeated and the old religion fell with them. Kamehameha II sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and commanding that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did however, allow personal family religion, known as *ʻaumakua* worship, to continue (Kamakau 1992; Oliver 1961).

With the end of the *kapu* system changes in the socio-economic patterns of the Hawaiian Islands began to affect the lives of the common people. Liholiho moved his court to Oʻahu, lessening the burden of resource procurement for the chiefly class on the residents of Hawaiʻi Island. Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early Western visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1856).

### Early Missionaries in Kaʻū

Historical accounts penned by missionaries offer vital glimpses into life in Kaʻū during the early 1800s. In October of 1819, prior to the battle between Liholiho and Kekuaokalani, seventeen Protestant missionaries set sail from Boston to Hawaiʻi. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the *aliʻi*, 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.

Reverend William Ellis, one of these early missionaries, visited the Ka'ū District in July of 1823. Ellis and his party landed at Kā'iliki'i to the west of South Point and set out overland. Ellis reported that this was the usual custom when travelling to the east, as the trade winds were too strong to continue the journey by sea around the south tip of the island; Menzies (1920) reported on this approach as well in 1794. After climbing Pali o Kalani, Ellis (2004:180) writes:

...A beautiful country now appeared before us, and we seemed all at once transported to some happier island... The rough and desolate tract of lava, with all its distorted forms, was exchanged for the verdant plain, diversified with gentle rising hills and sloping dales, ornamented with shrubs, and gay blooming flowers. We saw, however, no streams of water during the whole of the day; but from the luxuriance of the herbage in every direction, the rains must be frequent, or the dews heavy.

Ellis (2004:182) goes on to relate that the population in this part of the countryside:

...did not seem to be concentrated in towns and villages, as it was along the sea shore; but scattered over the whole face of the country, which appeared divided into farms of varied extent, and upon these the houses generally stood singly, or in small clusters seldom exceeding four or five in number.

Ellis (2004:181–182) also reported that the local residents were engaged in growing taro. He writes:

...Our path led us through several fields of mountain taro, a root which appears to be extensively cultivated in many parts of Hawaii. It was growing in a dry, sandy soil, into which our feet sank two or three inches, every step we took. The roots were of an oblong shape, generally from ten inches to a foot in length, and four or six inches in diameter. Seldom more than two or three leaves were attached to a root, and those were of light green colour, frequently blotched and sickly in their appearance. The inside of the root is of a brown, or reddish colour, and much inferior to that of arum esculentum or low land taro. It is however, very palatable, and forms a prime article of food in those parts of the island, where there is a light soil, and but little water.

In the years following Ellis' visit to Ka'ū, the American Board of Commissioners for Foreign Missions (A.B.C.F.M.) began to establish Protestant churches and schools in the district. Ka'ū did not have a permanent missionary presence until 1841, but was often visited by missionaries from the Districts of South Kona and Hilo during the 1820s and 1830s. By the early 1840s the A.B.C.F.M saw the need to establish a permanent mission station in Ka'ū. Previous appeals to do so by missionaries in Hawai'i had been unsuccessful, despite repeated arguments that the difficulty of travel to and throughout the district necessitated a permanent station there.

The decision to build the Protestant mission was influenced in part by the remoteness of the Ka'ū District and the difficulties that the South Kona and Hilo missionaries had servicing it. However, this decision was also a response to the growing influence of Catholic missionaries, who had arrived in the islands in 1828, and were themselves looking to establish a permanent presence in Ka'ū. As a result of this competitive dynamic, Reverend John Davis Paris was the first Protestant missionary permanently stationed in the Ka'ū District. Paris, originally from Virginia (born on September 22, 1809), had arrived in the islands on September 10, 1841 with the ninth company of A.B.C.F.M. missionaries. For many years Paris, along with his wife Mary Grant Paris, and their two children (Mary, born on O'ahu in 1841; and Anna, born at Wai'ōhinu in 1843) were the only foreigners living in the Ka'ū District, with the exception of a French priest (Paris 1926). The church where he would minister was located in Wai'ōhinu and organized in November of 1841. It was a grass house built on a large stone enclosure 110 feet long by 40 feet wide and four feet high with posts set in the wall with four doors, but no windows, and a stone floor covered with grass and mats.

In early February of 1842, the Catholic Church established a mission in Hilo. Shortly after, the island was divided into four missionary districts, and the Catholics began to compete with the Protestants for the souls of the natives. The missionary district of Ka'ū and Puna was assigned to Father Joachim Maréchal, who established his mission base at Hīlea; grass chapels were also erected at Kamā'oa, Naohulelua, Moa'ula, and Honu'apo (Elwell and Elwell 2005). The relationship between the Catholic and Protestant missionaries and their followers was not amicable and eventually progressed into a feud.

Tensions between the two rival churches continued unabated as Rev. Paris and Father Maréchal labored in their respective missionary fields throughout the 1840s. Paris was joined by a second Protestant missionary, the Reverend Timothy Hunt, in 1845, who established a mission residence and church at Punalu'u, but who resided in the district for less than a year before being reassigned to a new field (American Board of Commissioners for Foreign Missions 1846). Father Maréchal often toured his district, but maintained a residence at Hīlea. Both the Catholic and Protestant schools continued to operate, even as the population of the district decreased, and enrollment dropped.

In 1849 Rev. Paris' time in Ka'ū came to end. In that year, Paris returned to the United States with his daughters for an extended sojourn. In 1851, Paris would return to Hawai'i with his family and a new wife to continue his missionary work at the Ka'awaloa/Kealakekua mission station in South Kona—where he remained until his death in 1892 (Paris 1926). Father Maréchal continued to serve in Ka'ū and Puna until 1848, at which time he transferred to Kona and lived until his death in 1859 at the age of forty-five.

### Population Decline in Ka'ū

The population of Ka'ū in 1843 was estimated by missionaries to be nearly 5,000 people, less than half of the estimated population at the time of European contact (Kelly 1969, 1980). By 1847, when the first government census was taken, the population of the Ka'ū District had declined to 3,010 persons (Kelly 1980). There was no single reason for the decrease in population; rather, it occurred through an accumulation of changes that took place after contact with European and American explorers. One oft-cited reason is that Westerners brought foreign diseases with them, to which the Native Hawaiians had no resistance. A large portion of the Hawaiian population (perhaps as much as half) is said to have been lost to a plague that ravaged the islands ca. 1804 (Malo 1839; Schmitt 1968); in 1848-49 the inhabitants of the Islands were struck by a series of epidemics, including measles, whooping cough, influenza, and dysentery (Kelly 1969). In addition to population reduction caused by disease, many people moved to other islands; for example when Governor Kuakini moved from Hawai'i Island to O'ahu, many of his people followed him. Also, men who began working on whaling ships emigrated to foreign countries and rarely ever returned to Hawai'i (Schmitt 1973:16).

Another major factor in the decline of Ka'ū's population was famine caused by drought and fires (Kelly 1980). After visiting Ka'ū in 1846, missionary, schoolteacher, and surveyor Chester Lyman noted that a recent fire, which began at Honu'apo and then spread quickly westward by the trade winds, had “consumed houses taro & potato patches & produced a famine” Lyman (1846:14). Lyman also reported that he was told that another fire occurred in 1830 or 1831 that “burnt nearly the whole district”, and that “the natives speak of four such burnings as having taken place within the memory of their aged men” (Lyman 1846:14).

Another contributor to the depopulation of Ka'ū was the Government's taxation policies. Taxes levied on the people included poll taxes, land taxes, labor taxes, and a school tax (Kuykendall 1938). The labor tax required that an individual work six days out of the month—three days for the chief landlord, and three days for the King—or a pay a fee of nine dollars (Kelly 1969). Prior to 1840, the schools in the Ka'ū District were supported by the Protestant mission, but in that year, under pressure from the missionaries, a law was enacted for a national system of Hawaiian schools supported by the government. At first the King's share of the labor tax subsidized the schools; but in 1846, the burden of a school tax was placed directly on the people (Kelly 1969).

### The *Māhele* 'Āina of 1848

By the mid-nineteenth century, the ever-growing population of Westerners in the Hawaiian Islands had forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. By 1840, the first Hawaiian constitution had been drafted and the Hawaiian Kingdom had shifted from an absolute monarchy into a constitutional government. Convinced that the feudal system of land tenure previously practiced was not compatible with a constitutional government, King Kamehameha III and his high-ranking chiefs decided to separate and define the ownership of all lands in the Kingdom (King n.d.). This change was further promoted by missionaries and Western businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be taken from them at any time. After much consideration, it was decided that three classes of people each had one-third vested rights to the lands of Hawai'i: the King, the chiefs and *konohiki*, and their tenants (the common people). In 1845 the legislature created the “Board of Commissioners to Quiet Land Titles” (more commonly known as the Land Commission). The Land Commission was tasked with adopting guiding principles and procedures for dividing the lands and granting land titles and acting as a court of record to investigate and ultimately award or reject the claims brought before them.

To be considered, all lands, whether claimed by chiefs for entire *ahupua'a* or by tenants for house lots and gardens, had to be filed with the Land Commission within two years of the effective date of the Act (February 14, 1846); although this deadline was extended several times for chiefs and *konohiki*, but not for tenants (Soehren 2005). Native tenants of the land could claim and acquire title to the parcels that they actively lived or farmed on known as *kuleana* parcels. The Board of Commissioners oversaw the program and administered the *kuleana* as Land Commission Awards (LCAw.). Claims for *kuleana* had to be submitted during a two-year period that expired on February 14, 1848 to be considered. All of the land claimants were required to provide proof of land use and occupation, which took the form of volumes of native registry and testimony. The claims and awards were numbered,



## 2. Background

and the LCAw. numbers, in conjunction with the volumes of documentation, remain in use today to identify the original owners and their use of the *kuleana* lands. The work of hearing, adjudicating, and surveying the claims required more than the two-year term, and the deadline was extended several times for the Land Commission to finish its work (Maly 2002). In the meantime, as the new owners of the lands on which the *kuleana* were located began selling parcels to foreigners, questions arose concerning the rights of the native tenants and their ability to access and collect the resources necessary for sustaining life. The “Enabling” or “*Kuleana Act*,” passed by the King and Privy Council on December 21, 1849, clarified the native tenants’ rights to the land and resources, and the process by which they could apply for fee-simple interest in their *kuleana*.

During the *Māhele ‘Āina* of 1848, the subject *ahupua‘a* were relinquished to the Government (in lieu of commutations on various other lands they received) by their royal claimants: Kea‘ā 1<sup>st</sup> by William Pitt Leleiohoku, and Kea‘ā 2<sup>nd</sup> by Kahanaumaikai. As a result of the *Māhele*, no *kuleana* were awarded within the current study area. However, the study area is situated near two *kuleana* (LCAw. 9846 to Poohina, and LCAw. 9849 to Kapule) within Kea‘ā 1<sup>st</sup> and 2<sup>nd</sup> *ahupua‘a* (Figure 13). Poohina’s and Kapule’s *kuleana*, situated within the ‘*ili* of Popolohaunui and Waialaa respectively, were received from Nakahoa in 1838. The native testimonies provided for these *kuleana* are silent regarding the specific use of the land. Six additional *kuleana* awards are located near the current study area, but within neighboring *ahupua‘a* (LCAw. 9848 to Kinoulu, LCAw. 9847 to Poaeae, LCAw. 10296 to Makue, LCAw. 9211 to Kanaloa, LCAw. 9845 to Napahoa, and LCAw. 8750-B to Waianae; see Figure 13). The *Māhele* testimony for LCAw. 9211 to Kanaloa, located to the southeast of the current study area within Kaoiki ‘*ili* of Waiopua *Ahupua‘a*, was claimed as a *kīhāpai kalo* (taro field). It is likely that other *kuleana* awarded within the vicinity of the study area were cultivated as well.

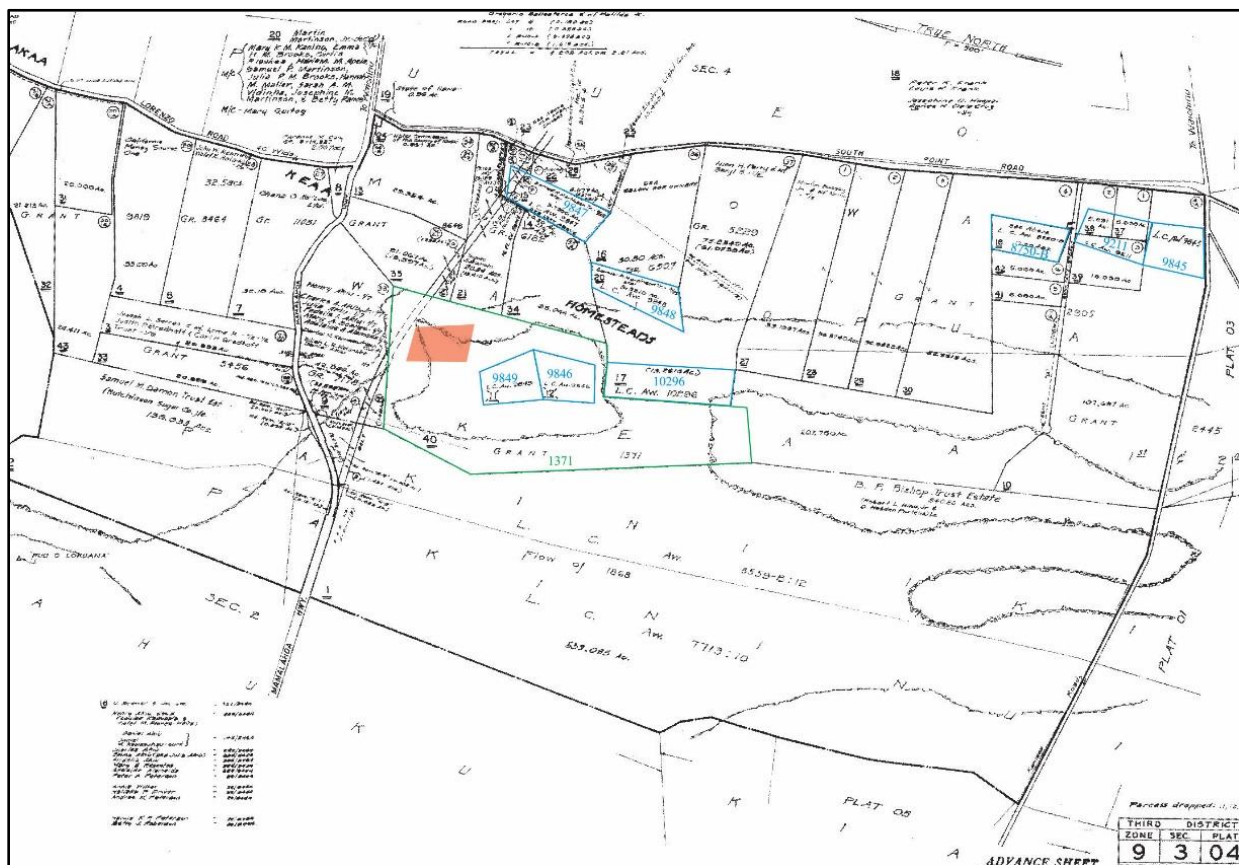


Figure 13. TMK: (3) 9-3-004 showing the study area shaded in red, nearby LCAsw. outlined in blue, and Grant 1371 outlined in green.



Following the *Māhele ʻĀina* of 1848, large parcels of land within Keaʻā 1<sup>st</sup> and 2<sup>nd</sup> Ahupuaʻa (those not awarded as LCAw.) were sold by the Hawaiian Government as Royal Patent Grants. The study area is located within a portion of Grant No. 1371 in Keaʻā 1<sup>st</sup> and 2<sup>nd</sup> which was sold to W. T. M. Koma on March 21, 1854. Including Grant No. 1371, 12 total in were sold in the vicinity of the study area by 1885 (Figure 14). Many of the grant parcels in this area were turned into pasture and used for ranching, and other government lands, not sold as grants, were leased for ranching purposes.

### The Mauna Loa Flow of 1868

In 1868 a volcanic eruption emanating from Mauna Loa volcano shook the southern part of Hawaiʻi Island, changing the landscape forever. Beginning on March 25<sup>th</sup>, a series of initial earthquakes were felt in the District of Kaʻū, and on March 27<sup>th</sup> smoke was seen rising from Mokuʻāweoweo Crater, the summit caldera of Mauna Loa. That evening even stronger earthquakes occurred, culminating in an estimated magnitude 7.1 earthquake on March 28<sup>th</sup>. The epicenter of this earthquake was near Waiʻōhinu, where as a result of the movement of the earth the government road was offset by a distance of more than its width (Hawaiian Volcano Observatory 2014). Several first-hand accounts of the events were published in the *American Journal of Science* that autumn (Dana and Coan 1868). This quake “destroyed a large stone church at Kahuku, and also all the stone dwelling houses in that place, including the houses...at the foot of the mountain” (Dana and Coan 1868:106). Frederick Lyman, who lived in Kaʻū at that time, wrote that on Friday morning, March 27<sup>th</sup>, 1868:

Between 9 and 10 oʻclock, a slight tremble, soon another, and another, at short intervals. Bella tried to keep a record of them, but soon gave it up, when they went into the hundreds during the day - some of them harder, and continued thro [sic] the night . . . with more earthquakes, increasing in violence. On Saturday, just after lunch, there was a hard one, peculiar, it seemed as if we moved backwards and forwards, 2 or 3 feet each time, for several seconds - it made the small children seasick - and it threw down some of our stone walls . . . but the earthquakes kept on too - every few minutes, often we could hear it coming from the south, then give us a good smart shake and pass on towards Kilauea, North East from us - at night it made the house rock and creak like a ship in a heavy sea, and we could not sleep... (Dana and Coan 1868:108)

The earthquakes continued for several days afterwards at a rate of between 50 and 300 per day, until Thursday, April 2<sup>nd</sup>, when at about four in the afternoon, an estimated 7.9 magnitude earthquake shook Kaʻū. This earthquake is believed to have been centered roughly five miles north-northeast of Pāhala, and to have occurred at a depth of about six miles below the surface (Hawaiian Volcano Observatory 2014). The earthquake generated a landslide that covered Kapaliuka Village in Wood Valley, killing thirty-one people, and a *tsunami* that destroyed all the coastal villages of Kaʻū and swept forty-six people out to sea. According to Reverend Celestine N. Ruault, a Catholic missionary stationed in Kaʻū at the time of the 1868 eruption, as a result of this quake, “every stone wall in Kau was down; frame and thatched houses were demolished; crockery and glassware were all in atoms,” and, “men and animals lay smitten on the ground” (Ruault 1909:98).

Frederick S. Lyman wrote of the April 2<sup>nd</sup> earthquake:

Soon after four oʻclock p.m. on Thursday we experienced a most fearful earthquake. First the earth swayed to and fro from north to south, then from east to west, then round and round, up and down, and finally in every imaginable direction, for several minutes, everything crashing around, and the trees thrashing as if torn by a hurricane, and there was a sound as of a mighty rushing wind. It was impossible to stand: we had to sit on the ground, bracing with hands and feet to keep from being rolled over... (Dana and Coan 1868:109)

Within minutes of the initial quake, the ocean rose up and a *tsunami* pounded the coast, washing inland in some locations as far as 150 yards (Sinoto and Kelly 1970). Frederick Lyman goes on to describe the *tsunami*, writing:

. . . All along the shore from directly below our place [Keaʻā] to Punaluʻu, a distance of three or four miles, the sea was boiling and foaming furiously. The waves covered the shore, and the water was red for at least an eighth of a mile from the land . . .

The villages along the shore were swept away by the great wave that rushed upon the land immediately after the earthquake. The eruption of the earth destroyed thirty-one lives, but the waves swallowed a greater number. (Dana and Coan 1868:110)

It was later reported that the wave destroyed 108 houses in Kaʻū and drowned forty-six people (Coan 1882). Ruault (1909:102), the Catholic missionary in Kaʻū, who was in Kamāʻoa when the largest earthquake occurred, reported that the Catholic church there was completely destroyed by this large earthquake.

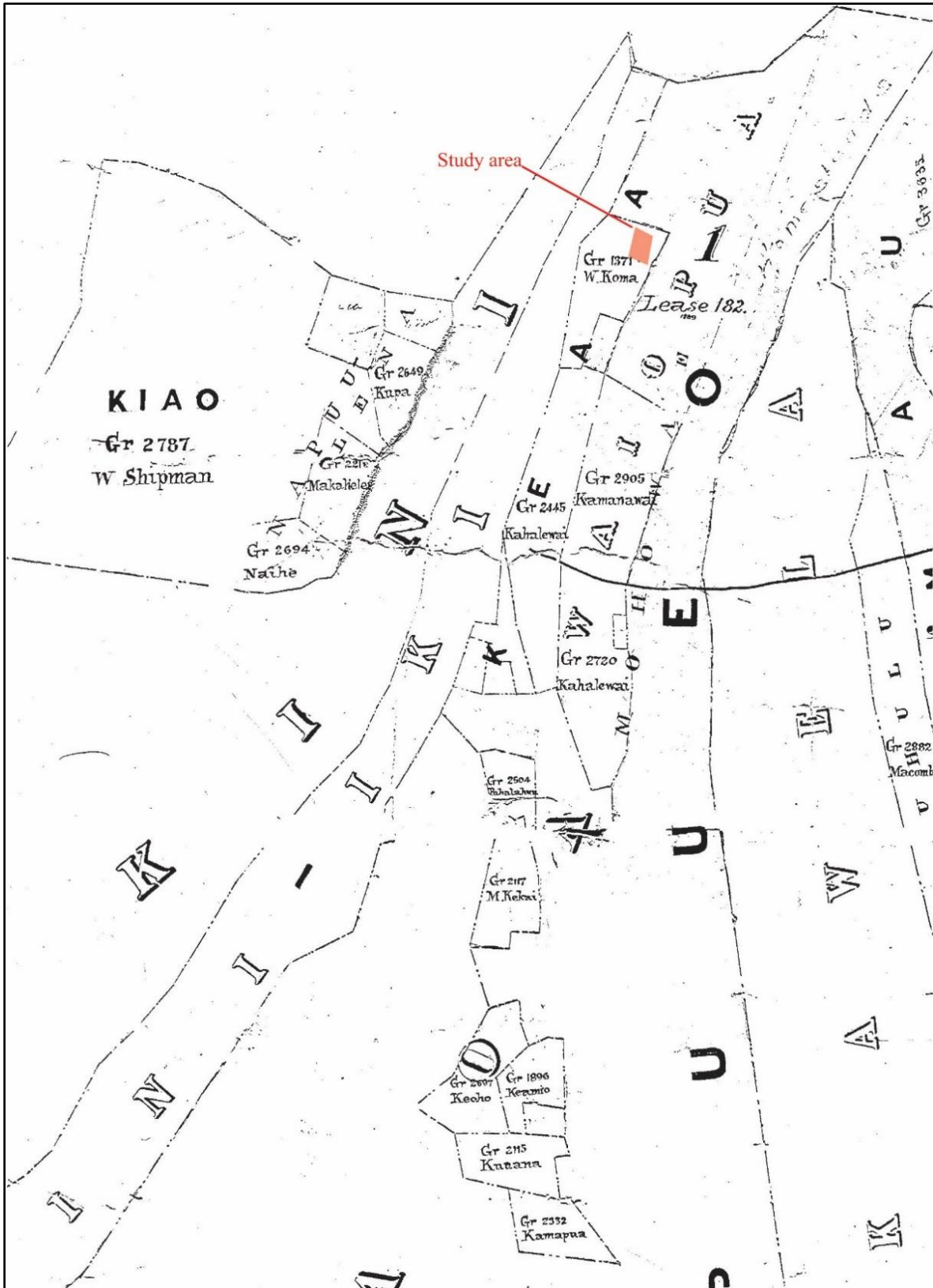


Figure 14. Portion of Hawai'i Registered Map No. 1409 (Compiled by Brown 1885) showing the grant parcels sold in the vicinity of the current study area.

Aftershocks plagued Ka‘ū following the April 2<sup>nd</sup> earthquake, and then on Tuesday, April 7<sup>th</sup> a fissure opened along the southwest rift zone of Mauna Loa that sent voluminous amounts of lava rushing towards the sea (Hawaiian Volcano Observatory 2014). The lava flows, which occurred near the southern tip of the island originating in Kahuku Ahupua‘a, reached the sea (a distance of 13 km), in only three and a half hours. One witness to the eruption, Henry M. Whitney, described “four grand fountains playing with terrific fury, throwing blood-red lava and huge stones, some as large as a house, to a height varying from 500 to 1,000 feet” (Dana and Coan 1868:113). The lava flow continued for four days, and by the time it ceased on April 11, 1868, it had surrounded the current study area with a fresh layer of ‘a‘ā. The aftershocks continued for several months following the eruption. The lava flow was witnessed (Pukui and Elbert 1986) first hand by C. J. Waiialoha, a resident of Ka‘ū, who recounted that:

... [On April 7] a stream of lava flowed from Mauna Loa to the sea by way of Pakini, so that the people of Kona cannot come to Ka‘ū and vice versa.

Five small craters (*puka ahi*) opened up at Pu‘u-o-loku-ana, between the sea and the mountain. The height of the leaping of the fire in some of these craters reached five hundred feet or more... streams of lava ran from Pu‘u-o-loku-ana to the sea. Flashes of lightning were seen in the dark clouds, red, silvery, green and white in color. The explosions heard were louder than the roar of a cannon. When the fire reached the sea, new banks were built up in the water from the land, extending toward the Kona [south-west] side... A terrible roar was heard below Waiohinu while the fire was flowing...

Before the lava appeared at Pu‘u-o-loku-ana on the evening of the 7<sup>th</sup> of April, a shower of ashes fell on the houses from Kahuku to Ninole. The natives and whites were excited thinking that their last hour had come, for such was the explanation of the learned whites. (Handy and Handy 1991:567)

An article in the Hawaiian language newspaper *Ka Nupepa Kuokoa* (translated at <http://www.hawaiian-roots.com/the-hawaii-volcano-eruption-of-1868.htm>) contains the following summary of the destruction caused in the 1868 lava flow in the vicinity of the study area:

... The number of animals killed by the lava in Kahuku and the two Pakini, all the way to Kamaoa, is thought to be no less than one thousand cows and horses. As for the goats and sheep, their number is unknown.

The lands which turned into pahoehoe, partially engulfed by lava, was the lands of Robert Brown, W. T. Martin, Kamamalu, W. C. Lunalilo, government land, and lands of other kamaaina people, lying outstretched from Kahuku to Puueo. These were all fertile lands.

It is guessed that the damages of all lands destroyed by lava included with property, is no less than seventy-thousand dollars (\$70,000) should it be properly tallied. The earthquake began in Kau from the last days of March until the 10<sup>th</sup> of April; it is believed that there were three thousand quakes that shook. Some were powerful while others were weak, but there was one that was the biggest, that being the quake of the 2<sup>nd</sup> of April, from which the many below perished.

As a result of the 1868 eruption the district of Ka‘ū was devastated. While the aftershocks eventually subsided and life returned to a semblance of normal, the coastal villages were destroyed by the *tsunami*, and most coastal residents moved to inland towns such as Nā‘ālehu, or moved out of the district altogether (Handy and Handy 1991). By 1872 the population of Ka‘ū had further declined to 1,865 persons (Kelly 1969). The destruction caused by the earthquakes, *tsunami*, and lava flow, and the resulting exodus of people from their lands, paved the way for the development of the commercial sugar and ranching industries in the Ka‘ū during the late nineteenth century.

### **The Lands in the Vicinity of the Current Study Area During the Twentieth Century**

By the late nineteenth century, plans were underway to subdivide many of the government lands leased for ranching and sugar cultivation in Ka‘ū—and throughout the Hawaiian Islands—into homestead lots that would be made available for sale at public auction. Two large subdivisions of land were planned in the vicinity of the current study area, the Kiolaka‘a-Kea‘ā Homesteads and the Kamā‘oa Homesteads to the south (Figure 15). The Kiolaka‘a-Kea‘ā Homestead lots, which bound the subject parcel to the north and east, were created in 1903 (Boyd 1903). A map prepared as part of that subdivision shows the newly created Kiolakaa-Kea‘ā Homestead lots and the lands encompassed by the current study area (Figure 16). This map, prepared by J. S. Emerson, represents the extent of the 1868 lava flow more accurately than earlier maps do (see Figures 11 and 15), and labels a point near the northern boundary of the study area “Huunakalili” (Figure 17).

2. Background

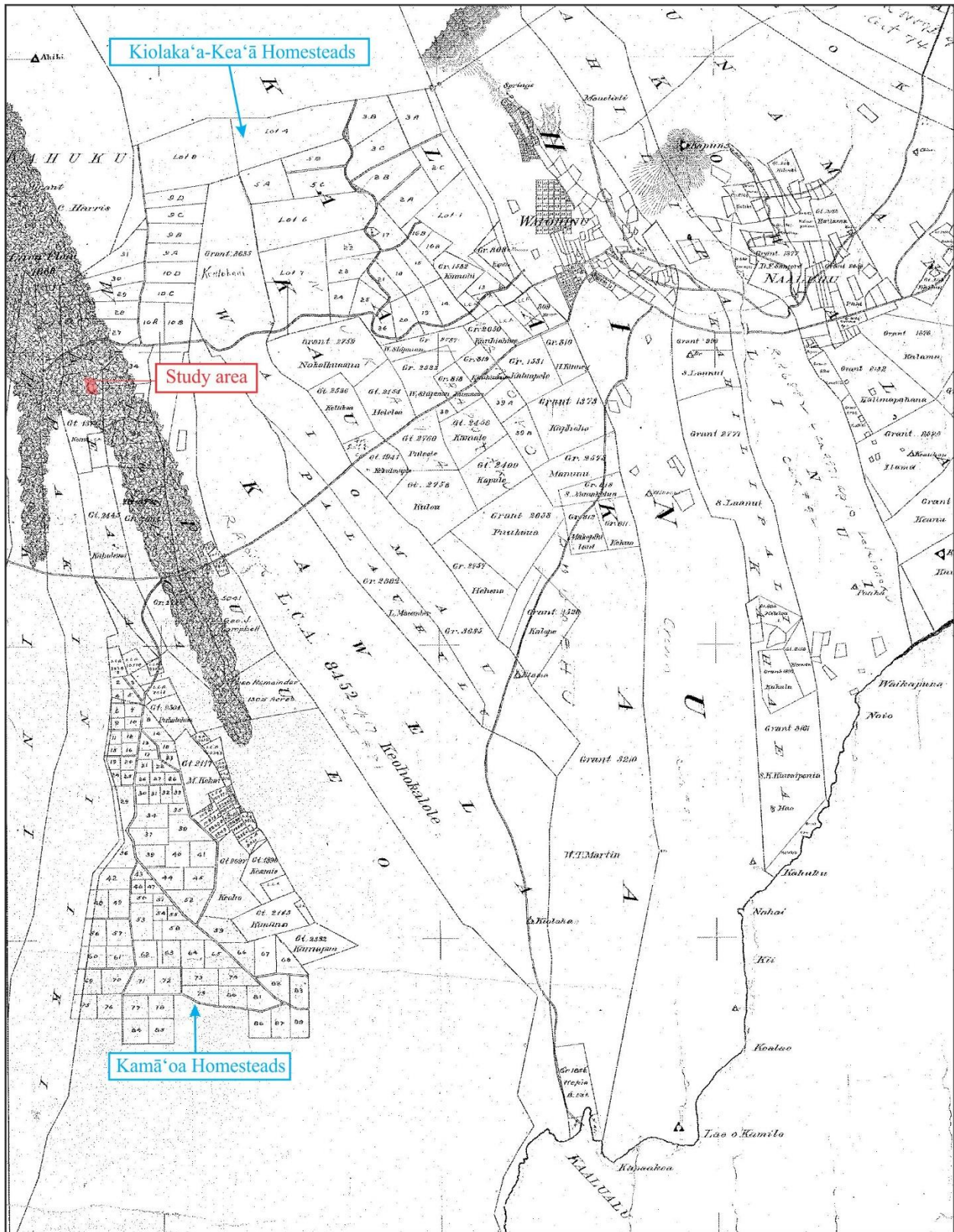


Figure 15. Portion of Hawaii'i Registered Map No.1807 (Dodge 1885) showing the location of the planned Kiolaka'a-Kea'a and Kama'oa Homesteads in relation to the current study area.



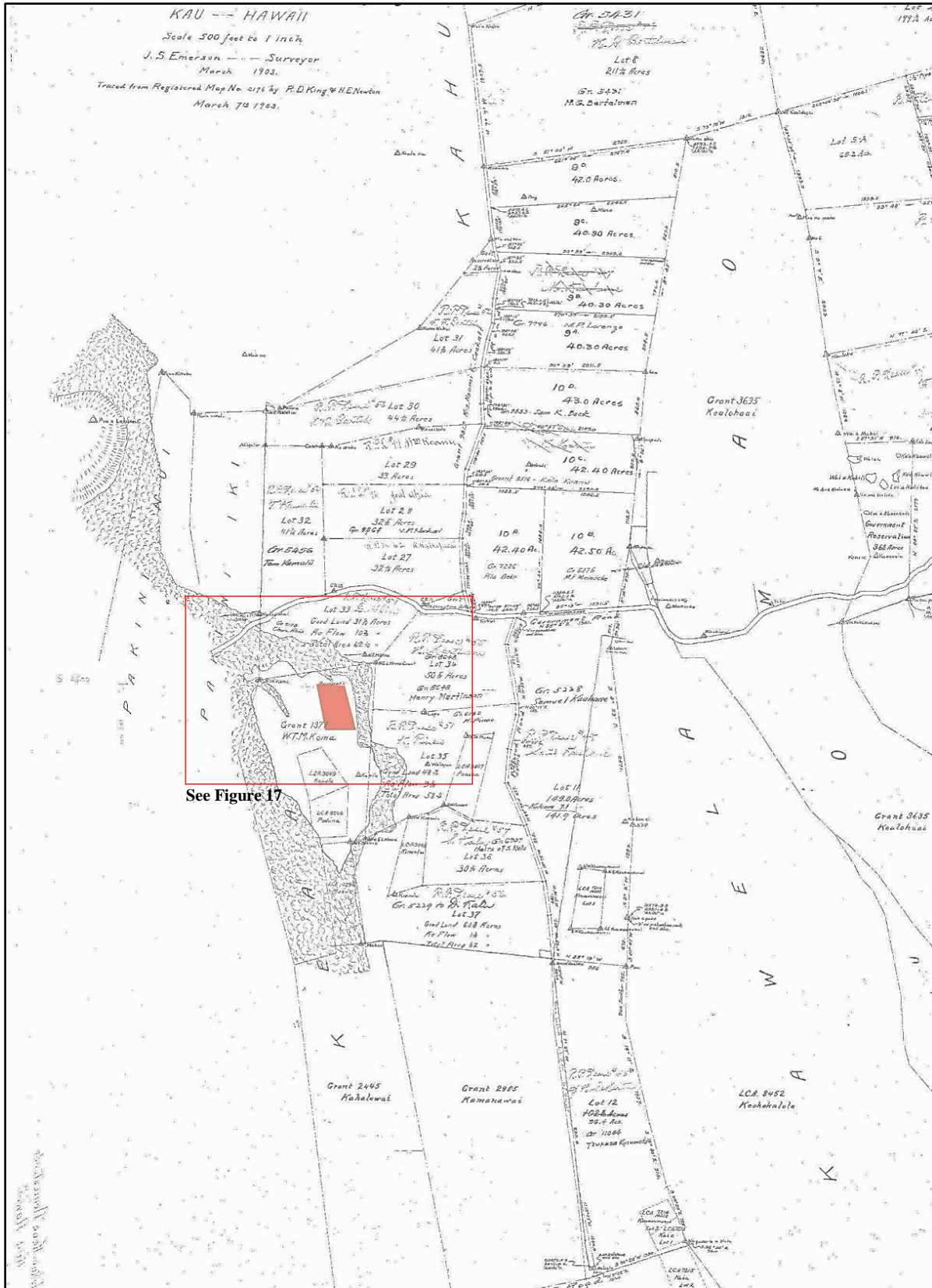


Figure 16. Portion of Hawai‘i Registered Map No. 2176 (Emerson 1903) showing the Kiolaka‘a-Kea‘ā Homestead Lots and the location of the current study area.

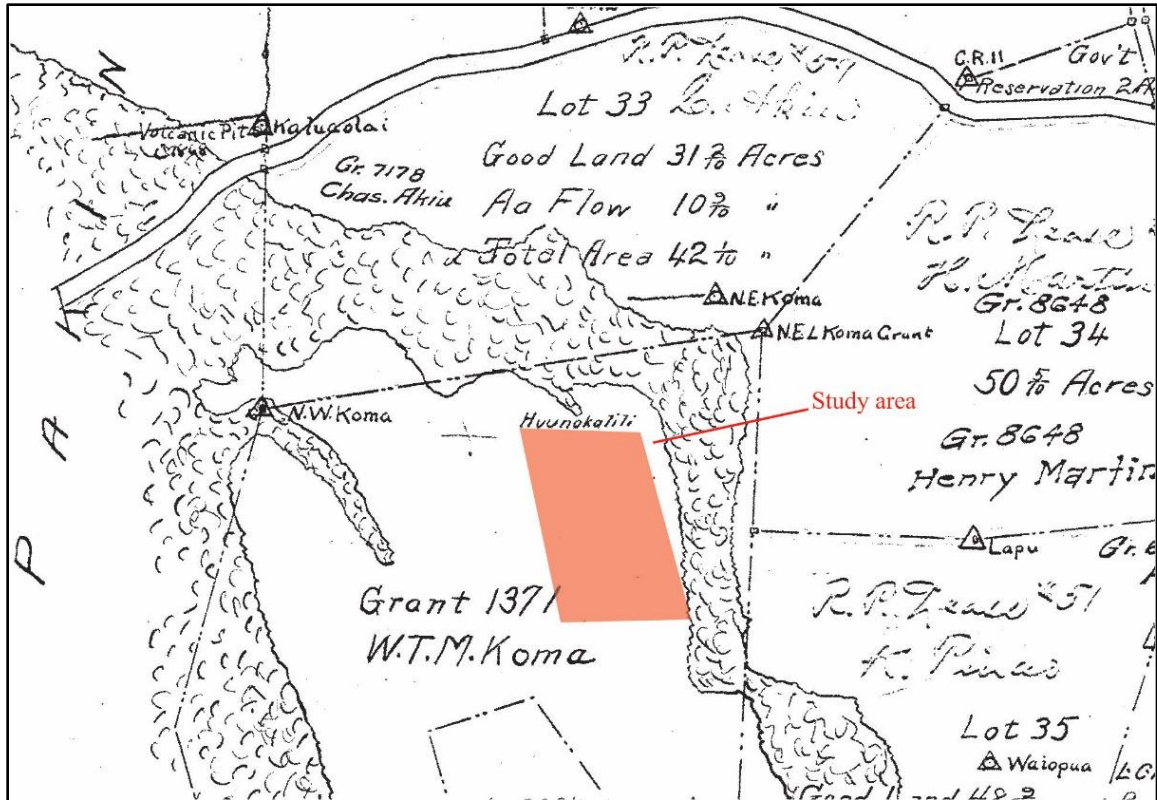


Figure 17. Detail of the Emerson (1903) map showing the location of the current study area relative to the 1868 lava flow and Haunakalili.

Huunakaulii, shown within a *kīpuka* of the 1868 lava flow near the *mauka* boundary of Grant No. 1371 (see Figure 17), is actually a mis-spelling of Hauna-ka-lili, a name that literally translates as “stench [of] the jealousy” (Pukui and Elbert 1986). The name was initially recorded in the field book of a Hawaiian land surveyor named Kaelemakule during the late 1800s, who described the location as follows:

The Haunakalili hole is about 30 ft. deep and 30 ft. in diameter. Meaning - Bad odor of jealousy. The people of the coast and the cultivators of the soil fought on account of jealousy. Starvation killed the vanquished who were thrown in hundreds into this hole. The hole has a stone wall about it to keep the cattle from falling in. Flow of 1868 came to the edge of this hole and a little went into it. (Field Book, Hawai‘i Registered Map No. 517:38)

No additional information regarding the origin of this name was uncovered during the course of this study.

On later U.S.G.S. maps from 1922 and 1962 (Figure 18), the larger *kīpuka* containing Haunakalili is labeled “Kipuka Auna o Ka Lili,” literally meaning “*kīpuka* of the flock of jealousy,” and “Kipuka Mana o Ka Lili,” literally meaning “*kīpuka* of the spirit of jealousy” (Pukui and Elbert 1986). Another nearby *wahi pana* within the boundaries of Grant No. 1371 is Pu‘u Po‘opa‘a (see Figure 18). Pu‘u Po‘opa‘a, literally meaning “hard head hill,” is a topographic high point around which lava flowed on both sides during the 1868 flow; Po‘opa‘a is also the name of an *‘ili* of Kea‘ā Ahupua‘a.

Aerial photographs taken during the mid to late 1900s indicate that the land encompassed by the current study area, while it may have been used for pasture, remained largely undeveloped until the end of the twentieth century. In a 1954 aerial photograph (Figure 19), the current study area appears to be covered in shrub or tree like vegetation, and a road or fence line extends north/south through the *kīpuka*, just west of its western boundary. By 1965, lands to the south and east of the study area appear to have been grubbed, but the study area itself seems relatively unchanged, with perhaps slightly thicker vegetation cover (Figure 20). By 1977, the powerline road located immediately north of the study area had been bulldozed, but again the study appears unchanged (Figure 21). Later aerial photographs indicate that the study area was initially grubbed of vegetation, likely for ranching purposes, between the 1970s and the early 2000s, and that the most recent grubbing episode occurred sometime shortly before 2007 (see Figure 9).



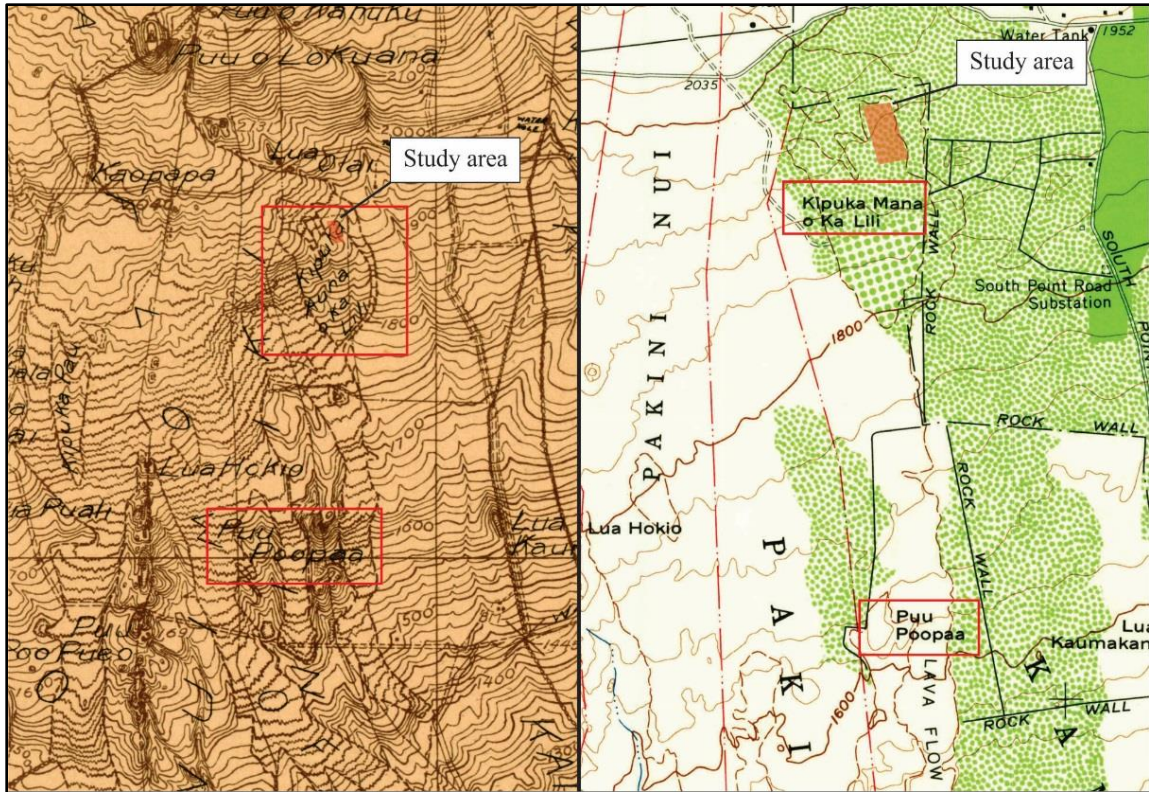


Figure 18. USGS 1922 (right) and USGS 1962 (left) maps; 1922 map reads “Kipuka Auna Ka Lili” while the 1962 map reads “Kipuka Mana o Ka Lili.”



Figure 19. 1954 aerial photograph with the location of the current study area indicated.





Figure 20. 1965 aerial photograph with the location of the current study area indicated.

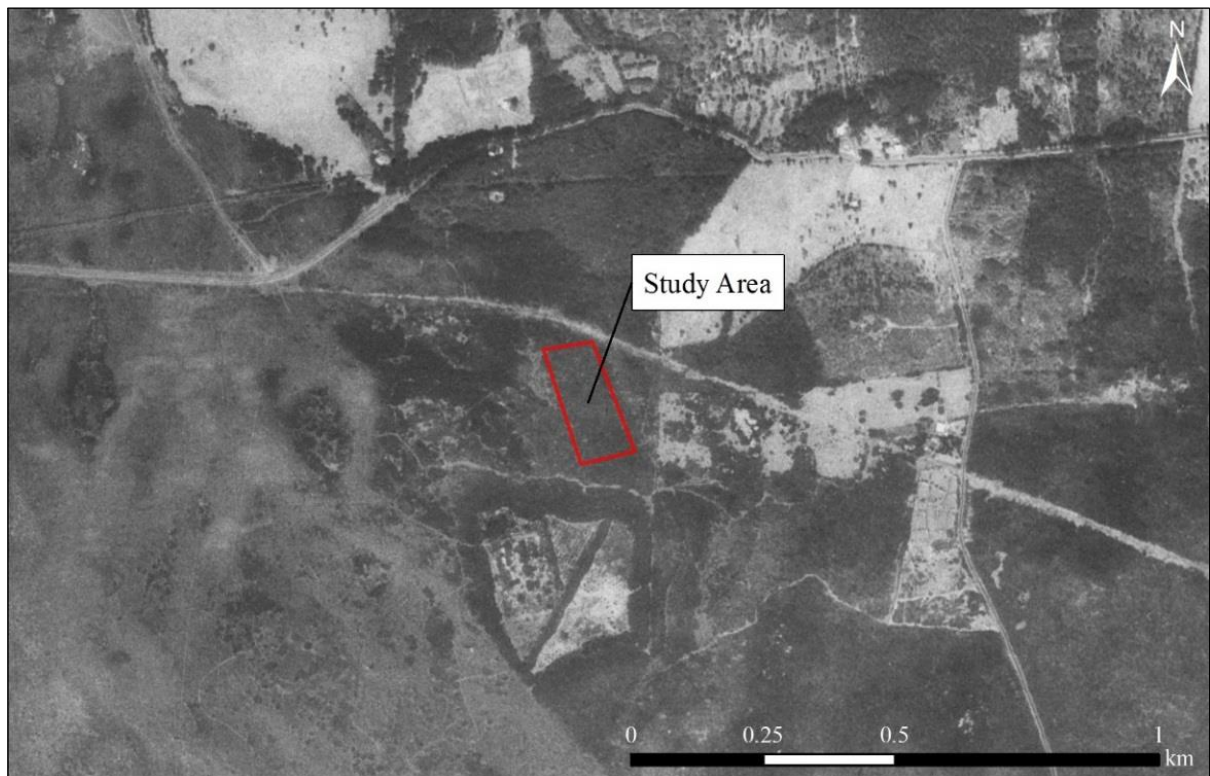


Figure 21. 1977 aerial photograph with the location of the current study area indicated.



## PREVIOUS ARCHAEOLOGICAL STUDIES

Archival research conducted at the offices of DLNR-SHPD in Hilo and Kapolei indicates that the subject parcel has not undergone prior archaeological investigation, however, several previous studies have been conducted within the district of Ka‘ū in the general vicinity of the current study area. The majority of these studies focused on coastal areas near South Point, although a few studies have occurred at more inland locations on parcels situated between South Point and Wai‘ōhinu Town. The earliest archaeological studies conducted by the B. P. Bishop Museum ( Landrum 1984; Sinoto and Kelly 1975; Stokes and Dye 1991) concentrated on coastal areas containing petroglyphs, known *heiau*, and village sites. While more recent studies have been conducted within the *mauka* portions of the *ahupua‘a* of Wai‘ōhinu, Kiolaka‘a, Pu‘u‘eo (Clark et al. 2004), and Pakini Nui and Pakini Iki (Clark and Rechtman 2004), only those within the boundaries of Pu‘u‘eo, Pakini Nui and Pakini Iki Ahupua‘a are included in this discussion based on their relative proximity to the current study area (Figure 22). Most recently, studies of the Ka‘ū field system have been conducted on the lands of the Hawai‘i Volcanos National Park Kahuku Unit and Kamehameha Schools in the vicinity of the current study area. The preliminary findings of these studies, which are as yet unpublished and are not available for review, indicate that the lands in this portion of Ka‘ū were once extensively cultivated during the Precontact Period, and that remnants of this field system are still evident in areas that have not been subject to widespread mechanical grading.

In 1906, John Stokes completed an inventory of the *heiau* of Hawai‘i Island (Stokes and Dye 1991). Stokes visited several *heiau* within the Ka‘ū District and noted at least one (Pakini Heiau) in the general vicinity of the current study area within the *ahupua‘a* of Pakini Nui or Pakini Iki. When Stokes visited the *heiau*, informants led him to a modern cattle pen with high rock walls, suggesting that the *heiau* had been dismantled to construct the pen. The repurposing of the stones comprising the *heiau* is likely, given that pens and corrals at this time were built wherever stones were readily available. This particular *heiau* may also correlate to the location where Imakakaloa may have been sacrificed by Kalaniopu‘u. In 1880, Fornander noted that the *heiau* was erected in expectation of Imakakaloa, who was subsequently sacrificed there (1969:202–203). However, the location of the sacrifice of Imakakaloa is disputed by the people of Wai‘ōhinu who claim that Imakakaloa was actually sacrificed at the *heiau* of Pāpāmoana within Wai‘ōhinu or at another *heiau* called Amamalua within Pakini Nui.

In 1970, Bishop Museum staff conducted an archaeological survey (Sinoto and Kelly 1975) of coastal sites of Pakini Nui and Pakini Iki, located to the southwest of the current study area (see Figure 22). As a result of their investigation, over 100 archaeological sites related to coastal activities (canoe shed, landing ramp, etc.) and habitation (C-shapes, house complexes, etc.) were recorded at Kā‘iliki‘i. Sinoto and Kelly (1975) suggest that the C-shapes could represent the remains of a campsite used by Kamehameha’s army in the 1780s (historical accounts confirm that his army was in the area at that time). Most artifacts found at Kā‘iliki‘i were fishing-related, which suggests that fishing was integral to village life in Kā‘iliki‘i, as in Wai‘ahukini. At Hāwea, located to the west of Kā‘iliki‘i, Sinoto and Kelly recorded 115 archaeological sites that were related to ceremonial practices, iconography, agriculture, and habitation. They concluded that Precontact occupation of Hāwea was similar in nature and duration to that of Wai‘ahukini and Kā‘iliki‘i.

In 1984, the B. P. Bishop Museum conducted a reconnaissance survey (Landrum 1984) along three separate *mauka-makai* transects within Kamā‘oa and Pu‘u‘eo *ahupua‘a*, located to the south of the current study area (see Figure 22). The survey was undertaken to quantify and understand the nature of archaeological resources present particularly within inland areas before any widespread development could occur; because prior to this survey, nearly all the archaeological research at South Point had concentrated on coastal sites. ’s study identified coastal sites in addition to sites situated at elevations up to roughly 500-foot above sea level. As a result of the fieldwork, Landrum (1984) found that a network of trails extended *mauka* from the densely populated coastline to form one main trail that continued out of the survey area, presumably to upland resource areas. Along the trail he found several isolated habitation complexes made up of one to thirty features. The constructions at these complexes were not nearly as substantial as those at the coastal habitation areas, which suggests that the occupation of *mauka* habitation sites was more temporary in nature and short-lived in nature. Landrum (1984:107) concluded, “the archaeological resources throughout the South Point region are being detrimentally impacted by man and nature” He recommended, among other things, that archaeological features should be cordoned off or generally protected from the impacts of man and cattle, and that much more study should be conducted of both the coastal and inland archaeological resources in the area.

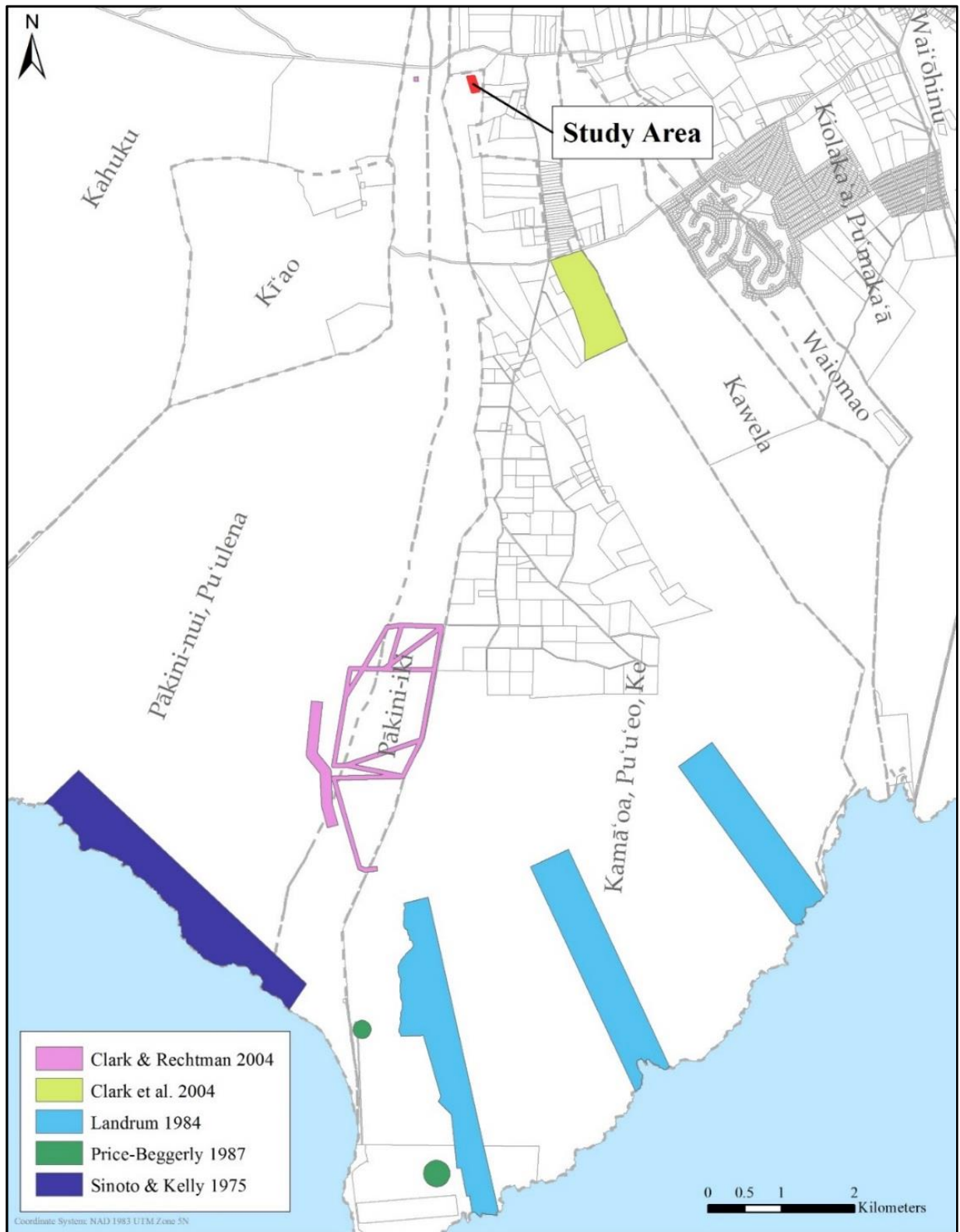


Figure 22. Prior archaeological studies conducted in the vicinity of the current study area.

In 1986, International Archaeology Research Institute, Inc. (IARII) conducted archaeological investigations (Price-Beggerly 1987) at the U.S. Army's Morse Field and Pacific Missile Range Facility (PMRF) located on South Point (see Figure 22). Investigations included survey, mapping, and subsurface testing. As a result of the archaeological investigation, no archaeological features were identified within PMRF, but IARII recorded the Kamā'oa Agricultural System (SIHP Site 50-10-76-10277) beyond the facility's perimeter based on the presence of inferred traditional agricultural features observed in aerial photographs. At Morse Field, three site complexes (SIHP Sites 50-10-76-10274, 50-10-76-10275, and 50-10-76-10276) were identified. SIHP Site 50-10-76-10274 included enclosures, an inferred Historic grave, a stone ramp, a wall, and remnants of a modern concrete construction. Site 50-10-76-10275 contained cairns, wall segments, a C-shape, a modified outcrop, two inferred burial crypts, and a U-shape. SIHP Site 50-10-76-10276 included ranching and 20<sup>th</sup> century military features that included concrete pads, water tank foundations, and core-filled wall segments.

In 2004, Rechtman Consulting, LLC conducted an archaeological inventory survey (Clark et al. 2004) of a roughly 190-acre parcel (TMK: [3] 9-3-003:073) located to the east of the current study area, at the intersection of Kamā'oa Road and South Point Road within Pu'u'eo Ahupua'a (see Figure 22). As a result of that survey, six archaeological sites were recorded, including Historic boundary walls that enclose the entire study parcel (SIHP Site 50-10-73-24122), a Historic burial within a small lava tube (SIHP Site 50-10-73-24123), a lava tube containing two sets of Precontact human skeletal remains and other habitation features (SIHP Site 50-10-73-24124), two collapsed lava tube depressions with historically modified edges (SIHP Site 50-10-73-24125 and SIHP Site 50-10-73-24126), and the remains of a large platform interpreted as a *heiau* (SIHP Site 50-10-73-24127). These sites documented the Historic ranching use of that study parcel, but painted a largely incomplete picture of the Precontact landscape. Nearly the entire study parcel had been mechanically cleared for ranching purposes. The only Precontact site that escaped the widespread mechanical clearing of Historic and Modern times not located within an inaccessible collapsed lava tube or within a lava tube itself, was the large platform that likely functioned as a *heiau* (SIHP Site 50-10-73-24127). Clark et al. (2004) suggest that it is possible, based on a review of Historic literature, that Site 24127 represents the remains of Pakini Heiau, where events important to Kamehameha's eventual rule over the Hawaiian Islands took place.

Later in 2004, Rechtman Consulting, LLC conducted an archaeological inventory survey (Clark and Rechtman 2004) for the proposed expansion of the Pakini Nui Wind Farm in Pakini Nui and Pakini Iki *ahupua'a*, located to the southwest of the current study area (see Figure 22). As a result of the survey, only four archaeological sites were recorded within their study area: two Historic ranch walls (SIHP Site 50-10-76-24074 and SIHP Site 50-10-76-24075), a Historic Survey Marker complex on top of a small *pu'u* known as Ahu a 'Umi (SIHP Site 50-10-76-24330), and a cairn (SIHP Site 50-10-76-24331). In contrast, several archaeological sites and features, consisting a variety of formal and functional types from both Precontact and Historic times were noted in the vicinity of, but beyond their study area boundaries. These additional features included walls, enclosures, terraces, cairns, mounds, modified outcrops, alignments, and a single petroglyph. They were interpreted as being used for habitation, agriculture, possible ceremonial, and ranching purposes. Records and locations of all these archaeological resources were maintained for future use, but they were not reported in detail.

### 3. STUDY AREA EXPECTATIONS

Based on the results of previous archaeological research in the South Point region and a review of historical documentation relative to Precontact and Historic settlement patterns in the area, it is known that during the Precontact Period, the majority of the population resided in small fishing villages concentrated along the coast. A network of trails connected these villages with *mauka* agricultural areas and an overland route which led from coastal Pakini to Puna (Ladd and Kelly 1969). Along these trails, in the intermediate zone, between the coastal and upland resource areas, the Precontact population lived in scattered farms with lone houses or small clusters of houses seldom exceeding four or five in number (Ellis 2004). This lands in the vicinity of the current study area would have been widely cultivated during the Precontact to early Historic Period.

The cultural landscape of Ka'ū changed drastically following an 1868 eruption of Mauna Loa, however, which sent lava flowing to the coast near South Point that surrounded the current study area within a *kīpuka*. A walled pit named "Haunakilili" that was partially filled in by the lava flow, is shown on Historic maps near the northern boundary of the current study area (see Figure 17). This pit was reported by the late nineteenth century Hawaiian land surveyor, Kaelemakule, as the place where the bodies of the vanquished were thrown following an ancient battle for food between the residents of the coast and those of the uplands. Historic Period land use within the study area, following the 1868 lava flow, would have been limited primarily to cattle ranching activities. Given that the entire study area was grubbed in ca. 2007, it is unlikely that any historic properties will be present.

## 4. FIELDWORK

On December 27<sup>th</sup>, 2018, Mathew Clark, M.A. (Principle Investigator), and Lokelani Brandt, M.A., conducted an intensive pedestrian survey of the study area (100% surface survey).

### FIELD METHODS

During the survey, pedestrian transects were walked north-to-south at a 20-meter interval until the entire study area was surveyed to completion. Ground visibility was adequate for identifying historic properties throughout the survey area as vegetation consisted predominately of grazed pasture grass. Immediately outside of the study area however, to the north and east, the vegetation transitioned from grazed grass to thick Christmas-berry trees covering the 1868 lava flow, and obscuring the ground surface along the study area's perimeter. These thickly vegetated areas were inspected at regular intervals to ensure that no historic properties were present on lands immediately adjacent to the current study area. Locational information for the study was collected using a Trimble GeoX7 handheld GPS unit.

### FIELD RESULTS

As a result of the current fieldwork, no archaeological features of any kind were encountered within the boundaries of the study area for the proposed construction of the Arion South Point Photovoltaic Project. The pit known as "Haunakalili" was identified, however, immediately north of the fence line delineating the northern boundary of the study area (Figure 23). This pit (Figure 24), appear much as described by Kaelemakule during the late nineteenth century. It measures about 10 meters in diameter by 10 meters deep, and is surrounded by a core-filled wall of stacked basalt cobbles and slabs. The northern wall surrounding the pit is situated near the edge of the existing HELCO powerline maintenance road, and appears to have been slightly damaged when that road was bulldozed during the 1970s. The bulldozed access road between the HELCO maintenance road and the gate in the fence line along the northern boundary of the study area is located roughly 5 meters east of the eastern wall surrounding the pit; the northern fence line is coterminous with the southern wall surrounding the pit for a short distance as it extends west from the gate (Figures 25 and 26). As noted by Kaelemakule in his Field Book for Hawai'i Registered Map No. 517 (page 38), this wall was likely constructed as a barrier to keep cattle from falling into the hole.



Figure 23. Location of Haunakalili pit relative to the current study area.





Figure 24. Interior of Haunakalili pit, view to the northwest from the southeastern edge.



Figure 25. Southern wall surrounding Haunakalili pit adjacent to the fenceline defining the northern boundary of the study area, view to the north.





Figure 26. Southeastern corner of the wall surrounding Haunakalili pit, view to the northeast.

Haunakalili pit itself was partially filled in by the 1868 lava flow, which is evident as a cascade of hardened lava along its northern interior edge. The ground surface within the pit is also comprised of this Historic lava flow, and a small opening to a subsurface chamber is present where it appears that the flow filled in a former lava tube that once extended north and south for the pit opening. The existing subsurface chamber was inspected, but it is only accessible for a short distance to both the north and south of the opening, and does not extend beneath the current study area. Only modern trash (aluminum cans) was noted within the pit.

## 5. DETERMINATION OF EFFECT AND RECOMMENDATIONS

Given that there were no archaeological resources identified within the current study area, and that the Haunakalili pit is situated wholly outside of the study area, it is concluded that the Arion South Point Photovoltaic Project will not impact any known historic properties. Therefore, the determination of effect for the proposed project is “no historic properties affected.”

With respect to the historic preservation review process of the DLNR–SHPD, our recommendation is that no further work needs to be conducted within the project area prior to or during project implementation. While the development of the study area will not directly impact any known historic properties, as a precautionary measure we recommend that prior to any development activities orange construction fencing be installed along the southern and eastern portions of the wall surrounding Haunakalili pit—where the wall is present next to the northern fence line of the current study area, and where it is present along the access road between the gate in that fence line and existing HELCO powerline maintenance road—to prevent any inadvertent damage. In the unlikely event that significant archaeological resources are discovered during the proposed ground disturbing activity associated with the development of the photovoltaic system, work will cease in the area of the discovery and DLNR-SHPD will be contacted pursuant to HAR 13§13-280-3.

---

**REFERENCES CITED**

- American Board of Commissioners for Foreign Missions  
1846 *The Missionary Herald*. Vol. XLII. T. R. Marvin, Boston.
- Athens, J. S., T. Rieth, and T. Dye  
2014 A Paleoenvironmental and Archaeological Model-Based Age Estimate for the Colonization of Hawai'i. *American Antiquity* 79(1): 144–155.
- Beaglehole, James (editor).  
1967 *The Journals of Captain James Cook on His Voyages of Discovery*. The Hakluyt Society, London.
- Boyd, E. S.  
1903 *Report of The Commissioner of Public Lands for the Year Ending June 30th, 1903*. Hawaii Star Print, Honolulu.
- Brown, J. F.  
1885 *Kau District, Hawaii*. Hawai'i Land Survey Division, Registered Map No. 1409. <http://ags.hawaii.gov/survey/map-search/>, accessed August 10, 2017.
- 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. Prepared By International Archaeological Research Institute, Inc., Honolulu, Hawai'i. Prepared for Belt Collins and Associates and Kamehameha Investment Corporation, Honolulu, Hawai'i.
- Clark, M. R., J. D. Nelson, and R. B. Rechtman  
2004 An Archaeological Inventory Survey of TMK:3-9-3-03:73, Pu'u'eo Ahupua'a, South Point, Ka'u District, Island of Hawai'i. Rechtman Consulting Report RC-0202. Prepared for Kamaoa Development Company, Kailua-Kona, HI.
- Clark, M. R., and R. B. Rechtman  
2004 An Archaeological Inventory Survey for the Apollo Pākini Nui Wind Farm Project (TMKs: 3-9-3-001:06 por. and 3-9-3-004:001 por.), Pākini Nui and Pākini Iki Ahupua'a, South Point, Ka'u District, Island of Hawaii. Rechtman Consulting Report RC-0164. Prepared for Tony Pace, Apollo Energy Corporation, Foster City, California.
- Coan, T.  
1882 *Life in Hawaii: An Autobiographic Sketch of Mission Life and Labors 1835-1881*. Randolph, New York.
- Dana, J. D., and T. Coan  
1868 Recent eruption of Mauna Loa and Kilauea, Hawaii. *American Journal of Science* Series 2-46(136): 105–123.
- Emerson, J. S.  
1903 *Kiolakaa-Keaa Homestead Lots, Kau-Hawaii*. Hawai'i Land Survey Division, Registered Map No. 2176. <http://ags.hawaii.gov/survey/map-search/>, accessed December 17, 2017.
- Donn, J. M.  
1901 *Hawaii, Hawaiian Islands*. Hawaii Territorial Survey Map. Registered Map 2060. <http://hdl.handle.net/10524/49272>, accessed August 9, 2017.

References Cited

---

- Duarte, T.  
2012 Colonization and Prehistory on the Island of Maui: A Radiocarbon Synthesis of Maui Island. M.A. Thesis, Department of Anthropology, University of Hawai‘i at Mānoa, Honolulu.
- Ellis, W.  
2004 *Journal of William Ellis, Narrative of a Tour of Hawaii, or Owhyee; with remarks on the History, Traditions, Manners, Customs and Language of the Inhabitants of the Sandwich Islands*. Advertiser Publishing Co., Ltd., Honolulu.
- Elwell, M., and D. Elwell  
2005 *Historic Na‘alehu : Hawaii’s Deep South*. The Paragon Agency, Publishers, Orange, CA.
- Fornander, A.  
1969 *An Account of the Polynesian Race: Its Origins and Migrations, and the Ancient History of the Hawaiian People to the Times of Kamehameha I*. Ed. John F. G. Stokes. Charles Tuttle & Co., Inc., Tokyo.
- Giambelluca, T. W., Q. Chen, A. G. Frazier, J. P. Price, Y.-L. Chen, P.-S. Chu, J. K. Eischeid, and D. M. Delparte  
2013 Online Rainfall Atlas of Hawai‘i. *Bulletin of the American Meteorological Society* 94(3): 313–316.
- Giambelluca, T. W., X. Shuai, M. L. Barnes, R. J. Alliss, R. J. Longman, T. Miura, Q. Chen, A. G. Frazier, R. G. Mudd, L. Cuo, and A. D. Businger  
2014 Evapotranspiration of Hawai‘i. Water Resource Management, State of Hawai‘i.
- Greene, L.  
1993 A Cultural History of Three Traditional Hawaiian Sites on the West Coast of Hawai‘i Island. United States Department of the Interior, National Park Service, Denver Service Center.
- Handy, E. S. C., and E. G. Handy  
1991 Native Planters in Old Hawaii: Their Life, Lore, and Environment. *Bernice P. Bishop Museum Bulletin* 233. With the collaboration of Mary Kawena Pūku‘i. Bishop Museum Press, Honolulu.
- Hawaiian Volcano Observatory  
2014 Two weeks of terror in Ka‘ū: The devastating events of 1868. *Volcano Watch*. March 27. <https://hvo.wr.usgs.gov/volcanowatch/view.php?id=221>, accessed March 27, 2017.
- Hommon, R.  
1986 Social Evolution in Ancient Hawai‘i. In *Island Societies: Archaeological Approaches to Evolution and Transformation*, edited by Patrick Kirch, pp. 55–88. Cambridge University Press, Cambridge, Massachusetts.
- I‘i, J. P.  
1963 Fragment of Hawaiian History. *B.P. Bishop Museum Special Publication* 70. Bishop Museum Press, Honolulu.
- Kamakau, S.  
1992 *Ruling Chiefs of Hawaii*. Revised edition. Kamehameha Schools Press, Honolulu.
- Kelly, M.  
1969 Historical Background of the South Point Area, Ka‘u, Hawaii. *Pacific Anthropological Records* No. 6. Anthropology Department, B.P. Bishop Museum, Honolulu.
- 1980 Majestic Kau: Moolelo of Nine Ahupuaa. *Departmental Report Series* 80–2. Department of Anthropology, B.P. Bishop Museum, Honolulu.



- 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.
- Kent, N.  
1983 *Hawaii: Islands Under the Influence*. University of Hawai‘i Press, Honolulu.
- King, J.  
1784 *A Voyage to the Pacific Ocean; Undertaken by Command of His Majesty, for Making Discoveries in the Northern Hemisphere: Performed under the Direction of Captains Cook, Clerke, and Gore, In the Years 1776, 1777, 1778, 1779, and 1780*. Vol. III. W. and A. Strahan, London.
- King, R.  
n.d. Hawaiian Land Titles. Manuscript. <https://ags.hawaii.gov/wp-content/uploads/2012/09/Hawn-Land-Titles-by-Robert-King.pdf>.
- Kirch, P.  
1984 *The Evolution of the Polynesian Chiefdoms*. Cambridge University Press, New York.  
1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawaii Press, Honolulu.  
2010 *How Chiefs Became Kings: Divine Kingship and the Rise of Archaic States in Ancient Hawai‘i*. University of California Press, Berkeley.  
2011 When did the Polynesians Settle Hawai‘i? A Review of 150 Years of Scholarly Inquiry and a Tentative Answer. *Hawaiian Archaeology* 12: 3–26.  
2012 *A Shark Going Inland Is My Chief: The Island Civilization of Ancient Hawai‘i*. University of California Press, Berkeley.
- Kuykendall, R.  
1938 *The Hawaiian Kingdom 1778–1854. Foundation and Transformation*. University Press of Hawaii, Honolulu.
- Kuykendall, R., and A. G. Day  
1976 *Hawaii: A History; From Polynesian Kingdom to American Statehood*. Prentice-Hall, Englewood Cliffs, New Jersey.
- Ladd, E. J., and M. Kelly  
1969 An Archaeological and Historical Survey at South Point, Island of Hawaii. Ms. 100069. Department of Anthropology, B.P. Bishop Museum, Honolulu.
- Landrum, J.  
1984 An Archaeological Reconnaissance of Three Mauka-Makai Transects Within Kamao‘a Pu‘u‘eo Ahupua‘a Ka‘u District, Hawai‘i Island.
- Lyman, C.  
1846 Journal (Book IV). Typescript. Hawaiian Mission Childrens’ Society Library, Honolulu.
- Malo, D.  
1839 Causes for the Decrease of Population in the Islands. Translated with comments by Lorrin Andrews. *The Hawaiian Spectator* 2(2): 125–130.  
1951 Hawaiian Antiquities. *B. P. Bishop Museum Special Publication 2*. Second edition. Translator Nathaniel B. Emerson. B. P. Bishop Museum Press, Honolulu.

References Cited

---

- Maly, K.  
2002      The Māhele ‘Āina (The Land Division) an Overview of Documentation Found in the Claims and Awards of the Māhele. Kumu Pono Associates, LLC.
- Menzies, A.  
1920      *Hawaii Nei, 128 Years Ago*. Honolulu, T.H.
- Oliver, D.  
1961      *The Pacific Islands*. University of Hawaii Press, Honolulu.
- Paris, J.  
1926      Fragments of Real Missionary Life. Manuscripts of Rev. John Davis Paris, with contributions by Mary C. Porter, Ethel M. Damon, and Ella Hudson Paris.
- Pogue, J. F.  
1978      *Mooolelo of Ancient Hawaii*. Translator Charles W. Kenn. Topgallant Press, Honolulu.
- Price-Beggerly, P.  
1987      Archaeological Investigations at Morse Field and Pacific Missile Range Facility, South Point, Kama‘oa-Pu‘u‘eo, Ka‘u, Island of Hawai‘i. International Archaeological Research Institution, Inc. (IARI). Prepared for U.S. Army Engineer District, Honolulu.
- Pukui, M. K., and S. H. Elbert  
1986      *Hawaiian Dictionary: Hawaiian-English, English-Hawaiian*. Rev. and enl. ed. University of Hawaii Press, Honolulu.
- Rechtman, R. B., and K. Maly  
2003      Cultural Impact Assessment for the Proposed Development of TMK:3-7-3-9:22, ‘O‘oma 2nd Ahupua‘a, North Kona District, Island of Hawai‘i, Volumes I and II. Rechtman Consulting Report RC-0154. Prepared for Helber Hastert & Fee, Honolulu, Hawai‘i.
- Ruault, C.  
1909      “Madam Pele’s” Awe-Inspiring Visit to Kau. In *The United States Catholic Historical Society*, 5, pp. 95–111. The United States Catholic Historical Society, New York.
- Sahlins, M.  
1985      *Islands of History*. The University of Chicago Press, Chicago.
- Samwell, D.  
1786      *A Narrative of the Death of Captain James Cook, to Which Are Added Some Particulars, Concerning His Life and Character, and Observations Respecting the Introduction of the Venereal Disease into the Sandwich Islands*. G.G. J. and J. Robinson, London.
- Schmitt, R.  
1968      *Demographic Statistics of Hawaii: 1778-1965*. University of Hawaii Press, Honolulu.  
1973      The Missionary Censuses of Hawai‘i. Pacific Anthropological Records 20. Department of Anthropology, B. P. Bishop Museum.
- Sherrod, D. R., J. M. Sinton, S. E. Watkins, and K. M. Brunt  
2007      Geologic Map of the State of Hawai‘i. *Open-File Report 2007-1089*. U.S. Department of the Interior, U.S. Geological Survey. <http://pubs.usgs.gov/of/2007/1089>, accessed April 27, 2018.

- 
- Sinoto, Y., and M. Kelly  
1975 Archaeological and Historical Survey of Pakini-Nui and Pakini-Iki Coastal Sites, Waiahukini, Kailiki'i, and Hawea, Ka'u, Hawaii. *Departmental Report Series 75-1*. Department of Anthropology, B. P. Bishop Museum, Honolulu.
- Soehren, L.  
2005 A Catalog of Hawai'i Place Names Compiled from the Records of the Boundary Commission and the Board of Commissioners to Quiet Land Title of the Kingdom of Hawaii. Part 4: Ka'u. <http://ulukau.org/cgi-bin/hpn?>, accessed September 14, 2016.
- Soil Survey Staff  
2018 Web Soil Survey. *United State Department of Agriculture, Natural Resources Conservation Service*. <http://websoilsurvey.nrcs.usda.gov/>, accessed March 20, 2017.
- Stokes, J., and T. Dye  
1991 Heiau of the Island of Hawai'i: A Historic Survey of Native Hawaiian Temple Sites. *Bishop Museum Bulletin in Anthropology 2*. Bishop Museum Press, Honolulu.
- Tomonari-Tuggle, M. J.  
1985 Cultural Resource Management Plan, Cultural Resource Management at the Keauhou Resort. Paul H. Rosendahl, Ph.D., Inc. (PHRI) Report 89-060185. Prepared for Kamehameha Investment Corp.
- Westervelt, W.  
1916 *Hawaiian Legends of Volcanoes*. G.H. Ellis Press, Boston.
- Wilkes, C.  
1856 *Narrative of the United States Exploring Expedition During the Years 1838-1842, Under the Command of C. Wilkes, U.S.N.* Vol. Volume IV. G. P. Putnam and Co., New York.
- Wilmshurst, J., T. Hunt, C. Lipo, and A. Anderson  
2011 High-Precision Radiocarbon Dating Shows Recent and Rapid Colonization of East Polynesia. *Proceedings of the National Academy of Sciences* 108: 1815-1820.