SPECIAL PERMIT APPLICATION

EXHIBIT 12 - 2015 SHPD SUBMITTAL SHEET AND 2015 ARCHAEOLOGICAL ASSESSMENT

Report submitted directly to Hilo Office Date: .....

Submittal Sheet for Historic Preservation Review Filing Fees

State Historic Preservation Division
601 Kamokila Blvd., #555, Kapolei, Hawai`i 96707

Agency/Firm (Requesting Review): .....

Contact: .....
Phone: ..... Fax: ..... E-Mail: .....
Address: .....

Title of Report/Plan: .....
.....
.....

Island: ..... District: ..... Ahupua`a: .....
TMK [(1) 1-1-001:001]: .....

Submitted Plan/Report Fee & Type: (All reports or plans submitted to the SHPD for review shall be accompanied by the appropriate fee in accordance with HAR §13-275-4 and §284-4).

.....		Indicate here (X) if report is a re-submittal (no fee charged)
.....	$50	Archaeological Assessment
.....	$150	Archaeological Inventory Survey Plan
.....	$450	Archaeological, Architectural or Ethnographic Survey Report
.....	$150	Preservation Plan
.....	$25	Monitoring Plan
.....	$150	Archaeological Data Recovery Plan
.....	$250	Burial Treatment Plan
.....	$100	Archaeological Monitoring Report, if resources reported
.....	$450	Archaeological Data Recovery Report
.....	$450	Ethnographic Documentation Report
.....	$25	Burial Disinterment Report
.....	$50	Osteological Analysis Report

Fee Total: $ ..... Make check payable to "Hawai`i Historic Preservation Special Fund." A service charge of $15 will be assessed on all dishonored checks pursuant to HRS §40-35.5" A copy of this form will be mailed or faxed back to you and will serve as your receipt.

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EXHIBIT 12

An Archaeological Assessment Survey of West Hawaii Concrete's Waikōloa Quarry

TMK: (3) 6-8-001:066 (por.)

Waikōloa Ahupua'a
South Kohala District
Island of Hawai'i

DRAFT VERSION

Prepared By:

Teresa Gotay, M.A.
and
Robert B. Rechtman, Ph.D.

Prepared For:

Jennifer Lim
Carlsmith Ball LLP
1001 Bishop Street, Suite 2100
Honolulu, HI 96813

June 2015

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

ASM Project Number 24370.00

An Archaeological Assessment Survey of West Hawaii Concrete Waikōloa Quarry

TMK: (3) 6-8-001:066 (por.)

Waikōloa Ahupua'a
South Kohala District
Island of Hawai'i

ASM affiliates

EXECUTIVE SUMMARY

At the request of Jennifer Lim of Carlsmith Ball LLP, on behalf of West Hawaii Concrete, ASM Affiliates conducted an archaeological assessment survey of a roughly 220 acre portion of TMK: (3) 6-8-001:066 within the West Hawaii Concrete Waikōloa Quarry Property, Waikōloa Ahupua'a, South Kohala District, Island of Hawai'i. The current study area is located along the boundary between the districts of South Kohala and North Kona and surrounded by undeveloped *'a'ā* lava flows on all sides. West Hawaii Concrete has been operating a concrete quarry within the study area since at least 1995. West Hawaii Concrete intends to seek approval from the Leeward Planning and State Land Use Commissions to extend the duration of the Special Permit and expand the permitted uses to include the following activities in addition to the currently permitted concrete quarrying: green waste processing and composting, cement concrete recycling and asphalt concrete recycling.

This survey 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 when no archaeological resources are discovered during an archaeological 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.

PHRI (Jensen and Burgett 1991) previously prepared an archaeological inventory survey of a roughly 300-acre parcel of land that included the 220 acre parcel which constitutes the current study area. PHRI recorded an absence of cultural resources within the current study area and the presence of nineteen sites in an area adjacent to the current study parcel. Intensive archaeological survey for the current study was conducted on May 20, 2015 by Teresa Gotay, M.A. and Layne Krause, B.A. under the direction of Robert B. Rechtman, Ph. D. Archaeological survey focused on the limited undeveloped sections around the periphery of the quarry site within the study area. Walking north-south transects spaced approximately 25 meters apart, fieldworkers did not encounter any archaeological resources.

Given the negative findings of the prior study and the similar findings of the current study, it is concluded that the proposed extension and amendment of the existing Special Permit will not impact any known historic properties. It is therefore recommended that no further historic preservation work is needed.

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1. INTRODUCTION

At the request of Jennifer Lim of Carlsmith Ball LLP, on behalf of West Hawaii Concrete, ASM Affiliates conducted an archaeological assessment survey of a roughly 220 acre portion of TMK: (3) 6-8-001:066 within the West Hawaii Concrete Waikōloa quarry site, Waikōloa Ahupua'a, South Kohala District, Island of Hawai'i (Figures 1, 2, and 3). West Hawaii Concrete intends to obtain approval from the Leeward Planning Commission and the State Land Use Commission to extend and amend the existing Special Permit, which allows for the operation of a quarry, to include the following activities: green waste processing and composting, cement concrete recycling and asphalt concrete recycling. This project area was subject to an archaeological inventory survey (Jensen and Burgett 1991) conducted in 1991 prior to the establishment of the quarry operation. As the Special Permit process dictates compliance with HRS Chapter 6E, and in an abundance of caution, the landowner decided to provide an updated archaeological study to verify that no historic properties would be affected by the proposed expanded operations.

This survey 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 when no archaeological resources are discovered during an archaeological 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 the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD), the State Land Use Commission (LUC), and the County of Hawai'i Planning Department with respect to the issuance of permits for land use and ground-altering activities. This report contains background information outlining the current study area's environmental and cultural contexts, a review of the findings from one previous archaeological study conducted within the current study area, and survey expectations based on the culture-historical context and previous investigation. An explanation of the current survey methods and findings will also be presented in addition to conclusions and recommendations based on the results of the current study.

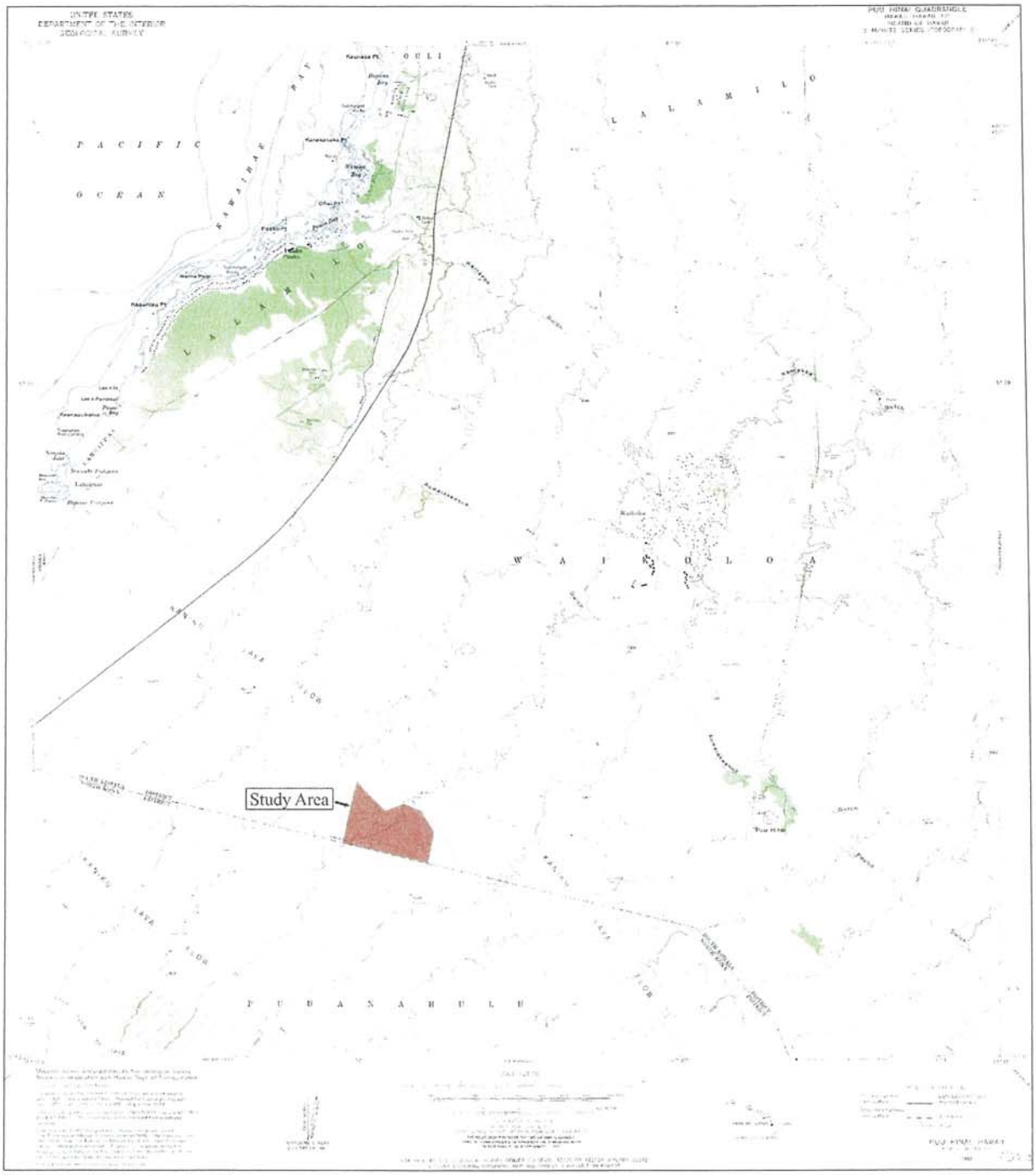

Figure 1. Study area location.

Figure 2. Tax Map Key (TMK) (3): 6-8-001 showing location of current study area (portion of Parcel 066).

Figure 3. Google Earth™ satellite image showing location of current study area outlined in red.

STUDY AREA DESCRIPTION

The current study area consists of 219.990 acres of land within a portion of TMK: (3) 6-8-001:066 located in Waikōloa Ahupua'a, South Kohala District, Hawai'i Island. The study area is situated roughly 4 miles *mauka* of the beachfront at 'Anaeho'omalu Bay, and is located along the South Kohala/North Kona boundary (see Figure 1). The study area is bounded at its south end by a transmission line corridor and unpaved access road (Figure 4), while the east, west, and north sides of the project area terminate in undeveloped land corresponding with the following TMK parcels: (3) 6-8-001:005 (west) and (3) 6-8-001:067 (north and east). Bordering the study area to the north, on TMK (3) 6-8-001:067, is an archaeological preserve containing nineteen sites within a roughly 30 acre area.

A gated access road enters the northwest corner of the study area from Waikōloa Road. This access road leads directly into a graded area with a weigh station (Figure 5) that marks the northwest boundary of the quarry site. Evidence of prior and current mechanical quarrying activity was observed during the field investigation (Figures 6 and 7). These quarried areas and the associated network of ungraded and graded access roads extend south-southeast from the northwest corner of the study area and cover roughly ninety-five percent of the approximately 220 acre property (Figure 8). The study area lands have been operated as a quarry by West Hawaii Concrete since 1995; Figure 9 shows a comparison of aerial photos of the study area taken 14 years apart, which highlights the mechanical alterations to the terrain over time.

The study area is situated at elevations ranging between 694 and 925 feet (211 and 282 meters) above sea level, within two lava flows that emanated from Mauna Loa known as the Kanikū Lava Flow (see Figure 1). Both flows within the study area are rugged expanses of *'a'ā* with near complete absence of soil. The earliest flow dates from between 3,000 and 5,000 years ago while the more recent flow occurred between 1,500 to 3,000 years ago (Wolfe and Morris 1996). Most of the Kanikū flow within the current study area has been altered by the ground disturbance associated with the quarry operations (see Figure 8).

Figure 4. Transmission line and access road marking the southern boundary of study area, view to the east.

Figure 5. Weigh station and graded access road near the entrance to study area, view to the northwest.

Figure 6. Mechanical quarrying activity within the current study area, view to the east.

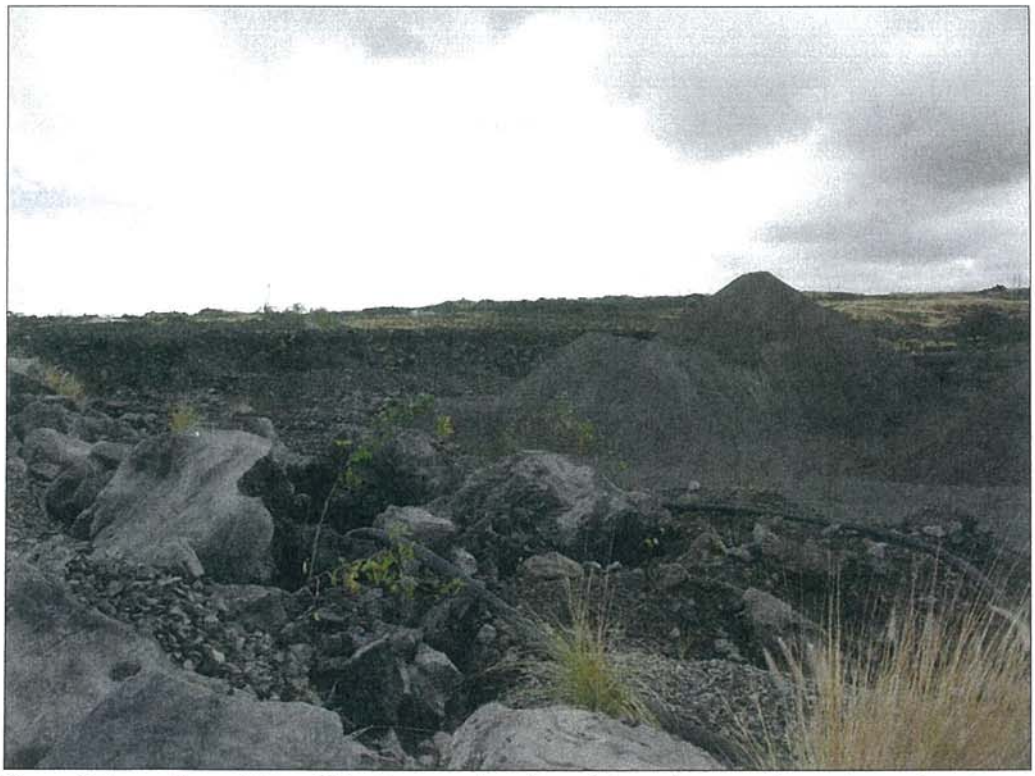

Figure 7. Quarrying activity within the central portion of the study area, view to the northeast.

Figure 8. 2015 Google Earth aerial of study area showing network of access roads and quarried areas.

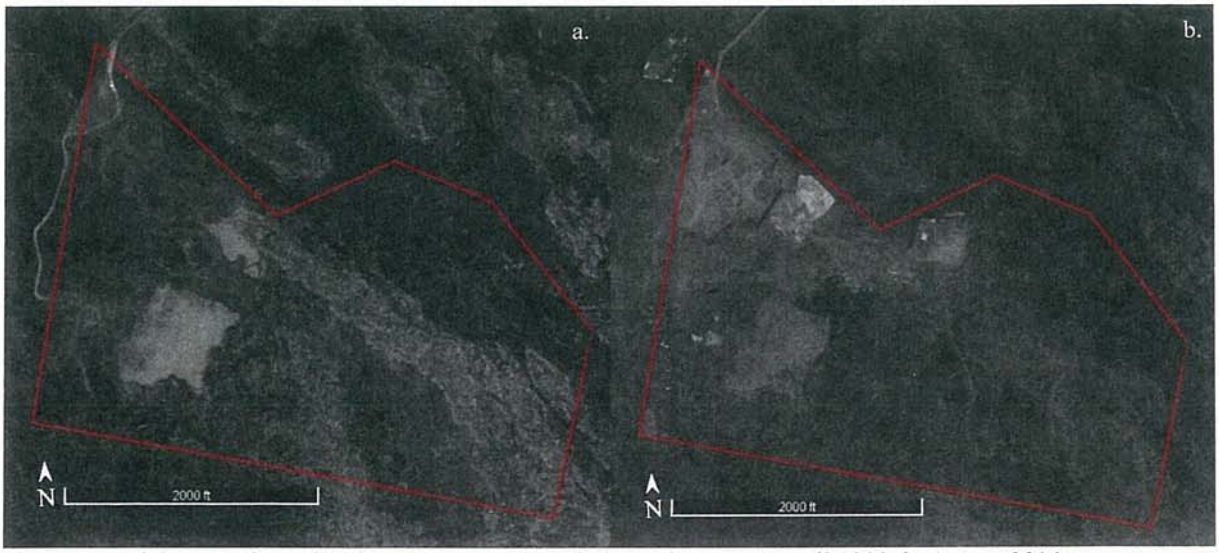

Figure 9. Aerial comparison showing quarry activity within study area: a. April 2000, b. August 2014.

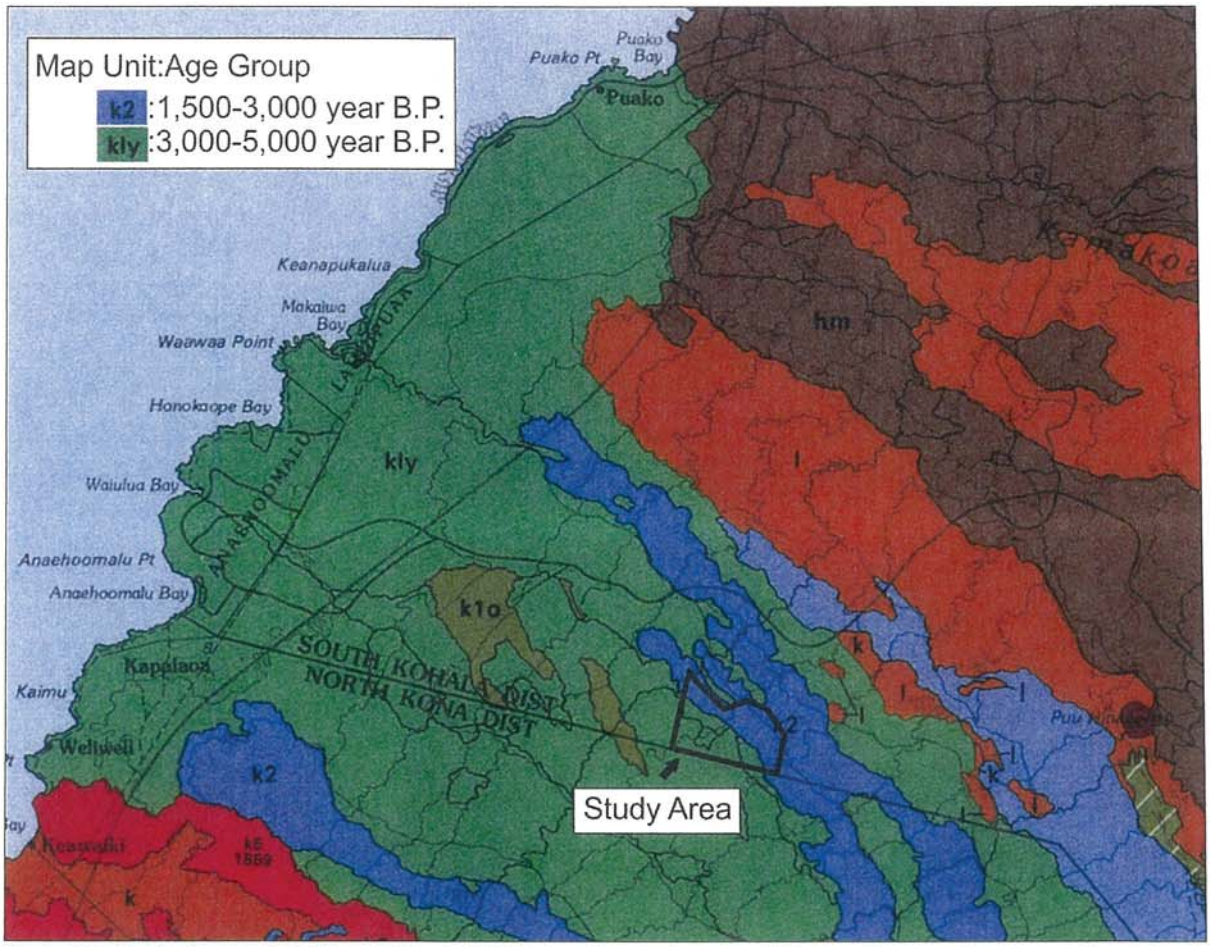

Figure 10. Geologic map (Wolfe and Morris 1996) showing study area within lava flows and corresponding dates.

The mean annual rainfall within the project area is 290.4 millimeters, with most of the rain (39-47 millimeters) falling during the wettest winter months of December and January, and very little rainfall (9-12 millimeters) during the driest summer months of June, July, and August (Giambelluca et al. 2013). As a result of the arid conditions, vegetation is sparse (see Figure 4), consisting primarily of scattered tufts of fountain grass (Pennisetum *setacaeum*). Fauna in the study environment is also limited by the harsh climate; however, fieldworkers did observe the droppings and skeletal remains of feral goats (*Capra* sp.).

2. BACKGROUND

To generate a set of expectations regarding the types of archaeological resources that might be encountered within the study area, and to establish an environment within which to assess the function, age, and significance of any such resources, a general cultural-historical background for the region is presented. The following section consists of a synthesis of Precontact settlement patterns and historically documented land use combined with a review of the findings of a prior archaeological investigation conducted in the current study area.

CULTURE-HISTORICAL CONTEXT

As previously discussed, the current project area is situated in what is today referred to as the *ahupua'a* of Waikōloa in South Kohala District on the leeward side of the Island of Hawai'i (Figure 11). It is within this context that the following discussion of the history and culture of the study area is framed. The chronological summary presented below begins with the peopling of the Hawaiian Islands and includes the presentation of a generalized model of Hawaiian prehistory containing specific legendary references to the vicinity of the study area and a discussion of the general settlement patterns for the district of South Kohala. This is followed by a summary of events in South Kohala after European contact, which includes a discussion of the changing lifeways and population decline of the early Historic Period, a review of land tenure in the study *ahupua'a* during the *Māhele 'Āina* of 1848, and ends with a summary of land use within the current study area during the late Historic Period.

A Generalized Model of Hawaiian Prehistory

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

The Settlement Period is believed to have been initiated by the arrival of settlers from the southern Marquesas Islands. This was a period of great exploitation and environmental modification, when early settlers adapted their familiar patterns and traditional tools into subsistence strategies suited to their new Hawaiian environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order, which was maintained by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the early Hawaiians brought from their homeland certain universal Polynesian customs: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *'aumakua* concept; various epiphenomenal beliefs; and the concept of *mana*.

In the traditional district or *moku* of Kohala, the long ridge of the Kohala Mountains extends perpendicular to the predominant northeasterly trade winds, creating an orographic rainfall pattern that separates the district into two distinct environmental zones; a wetter windward zone on the eastern (Hāmākua) side, and a drier leeward zone on the western (Kona) side. The first settlers of Kohala likely established a few small communities, primarily in the windward valleys and gulches, near sheltered bays with access to fresh water and had an occupational focus on the collection of marine resources. Evidence of the earliest occupation of leeward Kohala has been collected from Kapa'anui, where Dunn and Rosendahl (1989) recovered radiocarbon samples with a potential early date (A.D. 461), and from 'Anaeho'omalu where Barrera (1971) reported A.D. 900 as the initial date for settlement. These early dates should be viewed with suspicion (see Kirch 2011), but it is possible that they represent the earliest establishment of small, short-term camps to exploit seasonal, coastal resources in leeward Kohala. Data recovered from Māhukona, along the leeward coast of North Kohala, suggest initial occupation taking place there by about A.D. 1280 (Burgett and Rosendahl 1993:36); while Cordy (2000) reported on sites in windward Kohala that are believed to have been utilized in the early thirteenth century. Permanent settlement in Kohala has been reported as early as A.D. 1300 at Koai'e, a coastal settlement, with subsistence primarily derived from marine resources and likely supplemented by small-scale agriculture (Tomonari-Tuggle 1988).

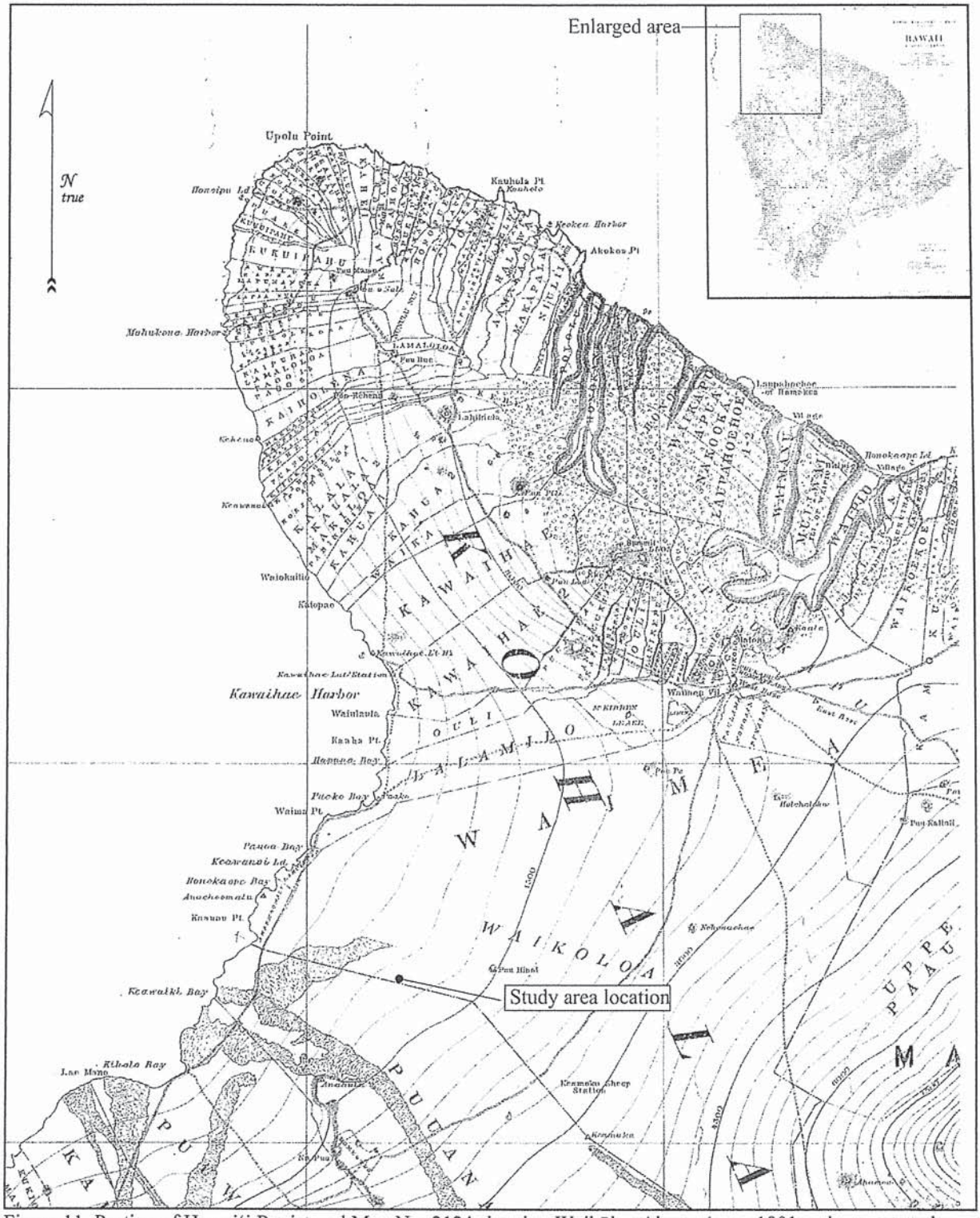

Figure 11. Portion of Hawai'i Registered Map No. 2124 showing Waikōloa Ahupua'a ca. 1901 and current study area location.

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

The Expansion Period of Hawaiian prehistory is characterized by extreme social stratification, major socioeconomic changes, and intensive land modification, which included expanded efforts to intensify upland agriculture. During this period, most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. The greatest population growth occurred during this time, which included a second major migration to Hawai'i from Tahiti, in the Society Islands. One of the earliest specific references to Waikōloa appears in the work of Samuel Mānaiakalani Kamakau who recounted the chants and legendary traditions of Hawaiian prehistory in his writings. According to Kamakau (1976) the priest Pā'ao arrived in the Hawaiian Islands during the 13th century from Kahiki, which has since been interpreted as Tahiti. Pā'ao was the keeper of the god Kū'kā'ilimoku, who had fought bitterly with his older brother, the high priest Lonopele, who expelled him from his homeland (Kamakau 1991).

Lonopele did not let Pā'ao leave peacefully, but instead called on the cold north winds to sink his canoes; one of the winds was named "Waikōloa" (Kamakau 1991:5). Despite Lonopele's best efforts, Pā'ao's canoe was not destroyed and he and his companions (thirty eight men, two stewards, his sister, chief Pili and his wife and the prophet Makuaka'ūmana) arrived safely in Hawai'i after their perilous journey. Kamakau (1991) recounts the following details of Pā'ao and Pili's arrival in Hawai'i:

> It is thought that Pā'ao came to Hawai'i in the time of the *ali'i* La'au because Pili ruled as *mo'i* after La'au. You will see Pili there in the line of succession, the *mo'o kū'auhau*, of Hanala'anui. It is said that Hawai'i Island was without a chief, and so a chief was brought from Kahiki; this is according to chiefly genealogies. Hawai'i Island had been without a chief for a long time, and the chiefs of Hawai'i were *ali'i maka'āinana* or just commoners, *maka'āinana*, during this time.
>
> . . . There were seventeen generations during which Hawai'i Island was without chiefs—some eight hundred years. . . . The lack of a high chief was the reason for seeking a chief in Kahiki, and that is perhaps how Pili became the chief of Hawai'i. He was a chief from Kahiki and became the ancestor of chiefs and people of Hawai'i Island. (1991:100–102)

The *moku* of Kohala appears in several versions of the Pili ruling line's origin story; such as a version discussed by Beckwith (1976) in which Mo'okini and Kaluawilinau, two *kāhuna* of Moikeha, decide to stay on at Kohala. In addition, Kamakau (1964) recounts that

> In the burial cave of Pu'uwepa in Kohala, Hawaii are deposited the bones of Pa'ao, the famous kahuna who built the heiau of Mo'okini at Kohala, and who lived a span of 15 generations before he died. Its entrance is said to be beneath the sea (1964:41)

The Pili chiefs initial ruling center was likely in Kohala too, but Cartwright (1933) suggests that Pili later resided in and ruled from Waipi'o Valley in the Hāmākua District.

Rosendahl (1972) has proposed that settlement in leeward Kohala during the Expansion Period was related to seasonal, recurrent occupation. Coastal sites were occupied in the summer to exploit marine resources, while upland sites were occupied during the winter months with a primary focus on agriculture. According to Hommon (1976), an increasing reliance on agricultural products may have caused a shift in social networks as well; kinship links between coastal settlements disintegrated as those links within the *mauka-makai* settlements expanded to accommodate the exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the *ahupua'a* system. The implications of this model include a shift in residential patterns from seasonal/temporary occupation to permanent, dispersed occupation of both coastal and upland areas.

According to Kirch's (1985) model, the concept of the *ahupua'a* was established sometime during the A.D. 1400s, adding another component to a well-stratified society. This land unit became the equivalent of a local community, with its own social, economic, and political significance. *Ahupua'a* were ruled by *ali'i 'ai ahupua'a* or lesser chiefs;

who, for the most part, had complete autonomy over this generally economically self-supporting piece of land, which was managed by a *konohiki*. *Ahupua'a* were usually wedge or pie-shaped, incorporating all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). This form of district subdividing was integral to early Hawaiian life, and was the product of strictly adhered to resource management planning. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003). The *ali'i* and the *maka'āinana* (commoners) were not confined to the boundaries of their *ahupua'a;* when there was a perceived need, they also shared with their neighbor *ahupua'a 'ohana* (Hono-ko-hau 1974). The *ahupua'a* were further divided into smaller sections such as the *'ili, mo'o'aina, pauku'aina, kihapai, koele, hakuone*, and *kuakua* (Hommon 1986, Pogue 1978). The chiefs of these land units gave their allegiance to a territorial chief or *mō'ī* (king).

Traditionally, Waikōloa was an *'ili* of the *kalana* (or *'okana*) of Waimea (Figure 12), a land division that in ancient times was treated as a sub-district, smaller than a district (*moku o loko*), but comprised of several other land divisions that contributed to its wealth (Maly and Maly 2002). The lands within the *kalana* of Waimea were those that form the southern limits of present day South Kohala District including 'Ōuli, Wai'aka, Lālāmilo, Puakō, Kalāhuipua'a, 'Anaeho'omalu, Kanakanaka, Ala'ōhi'a, Paulama, Pu'ukalani, Pu'ukapu, and Waikōloa, where the current study area is located (Figure 13).

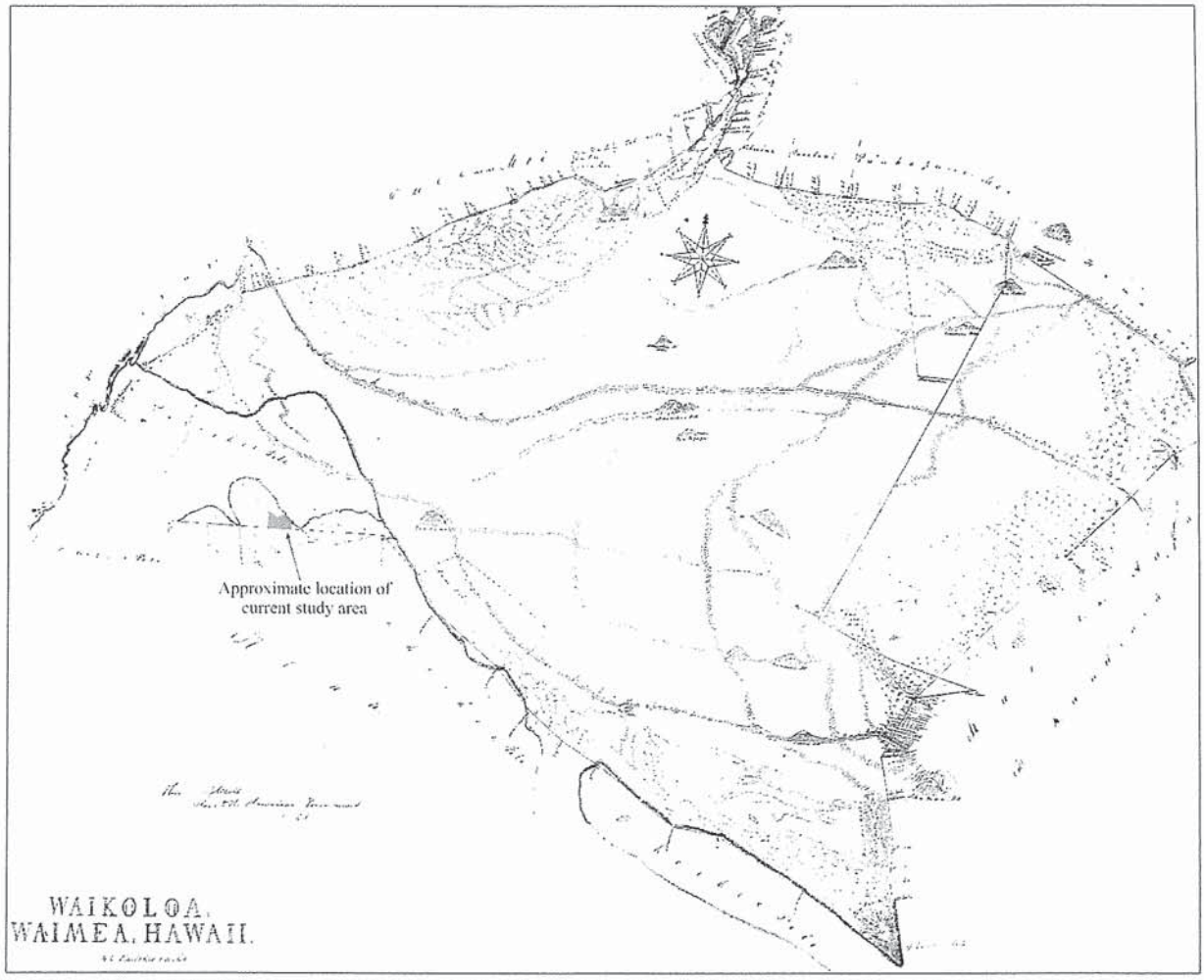

Figure 12. Registered Map No. 574 showing Waikōloa, the *kalana* of Waimea and the approximate location of the current study area (prepared by Kaelemakule, n.d.).

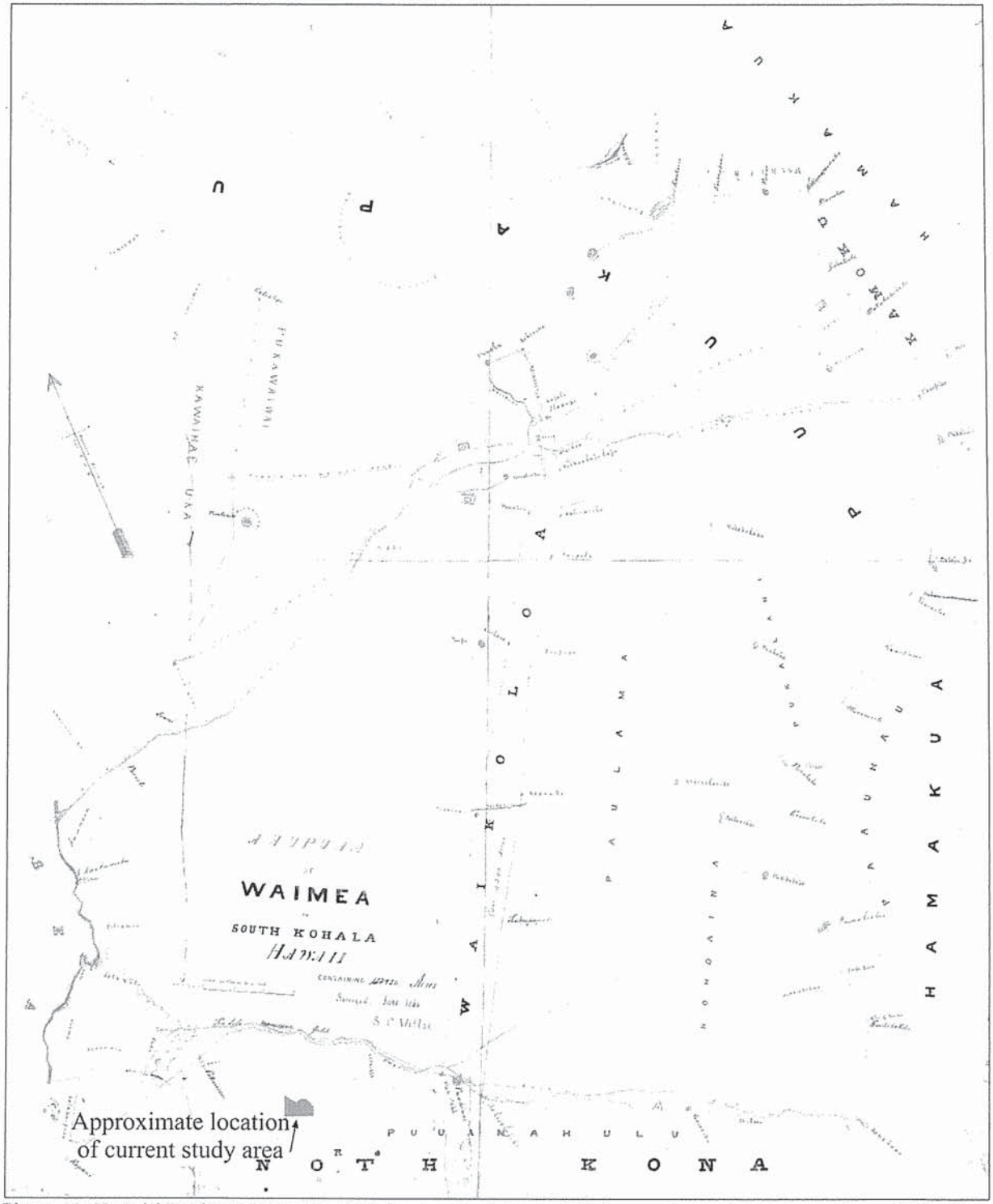

Figure 13. Hawai'i Registered Map No. 712 showing the *kalana* of Waimea and associated *ahupua'a* ca. 1866 with approximate location of the current study area.

Bernice Judd, a former librarian at the Hawaiian Mission Children's society, explains that:

> In the early days Waimea meant all the plateau between the Kohala Mountains and Mauna Kea, inland from Kawaihae. This area is from eight to ten miles long and from three to five miles wide. There was no running water on Mauna Kea, so the inhabitants lived at the base of the Kohala Mountains, where three streams touched the plain on their way towards the sea. . . The middle stream, which was famous for wild ducks, was named Waikoloa, or Duckwater. This and the most westerly stream, called Kahakohau, went towards Kawaihae, but neither reached the sea, except in times of flood. (Judd 1932:14)

In some early accounts, Waikolōa Ahupua'a was referred to as Waikōloa Nui, and the neighboring *ahupua'a* of Lālāmilo as Waikōloa Iki (Maly 1999). Unlike the early maps of Waimea prepared by Kaelemakule (see Figure 12) and S.C. Wiltse in 1866 (see Figure 13), Hawaiian Government Survey maps prepared by John M. Donn in 1901 (see Figure 11) and by C.J. Lyons in 1928 (Figure 14) both show the *ahupua'a* of Waikōloa as it appears today.

Heiau construction flourished during the Expansion Period as religion became more complex and embedded in a sociopolitical climate of territorial competition. Monumental architecture "played a key role as visual markers of chiefly dominance" (Kirch 1990:206). This pattern continued to intensify from A.D. 1500 until contact (A.D. 1778), and archaeological evidence suggests that substantial revisions were made to the political system as well. Within Kohala, the Great Wall complex at Koai'e is organized with platforms in the complex set apart from contemporaneous features; Griffin et al. (1971) interpret this separation within the complex as symbolic of class stratification.

During the Expansion Period agricultural intensification occurred primarily in the uplands of South Kohala. Although most of the taro and sweet potato fields of South Kohala were located in the rainier uplands near the present day town of Waimea (where there was also a sizable permanent population),Handy and Handy relate that:

> the coastal section of Waimea, now called South Kohala, has a number of small bays with sandy shores where fishermen used to live, and where they probably cultivated potatoes in small patches... Puako near the Kona border was a sizable fishing village at one time where there were undoubtedly many sweet potato patches" (1991:532)

In addition to taro and sweet potato fields, *kō kea* (white cane), the most common variety of sugarcane (*Saccharum officinarum*) was often planted near Hawaiian homes and was utilized for a variety of medicinal and culinary purposes (Handy and Handy 1991). Sugar cane was also used as thatch for houses when *pili* grass (*Heteropogon contortus*) or *lau hala* (*Pandanus odortissimus*) were in short supply (Malo 1903). The name of the village of Puakō, literally translates as "sugarcane blossom" (Pukui et al. 1974). Pukui (1983) cites the following ancient proverb that references the sugar cane in Kohala:

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

Pukui stresses that Hawaiian proverbs have layers of meaning that are best left to the imagination of the reader and offers the following interpretation of this proverb:

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

Another Hawaiian legend, the Legend of Kanikū and Kanimoe, two *mo'o* or water-spirits with lizard bodies, is worth mentioning as part of the current investigation because the study area is located within the lava flow (Figure 15) that bears the water spirit's name. According to an interview documented by Wolforth et al., these two *mo'o* took the form of beautiful women and lived in the "large coastal fishpond of Wainānāli'i in Pu'uanahulu" (2005:6). According to the legend, Kanikū and Kanimoe were turned to stone when a lava flow covered the fishpond and as a result, their bodies still lie side by side in the middle of the *'a 'ā* flow, which is how the Kanikū Lava Flow got its name (Wolforth et al 2005).

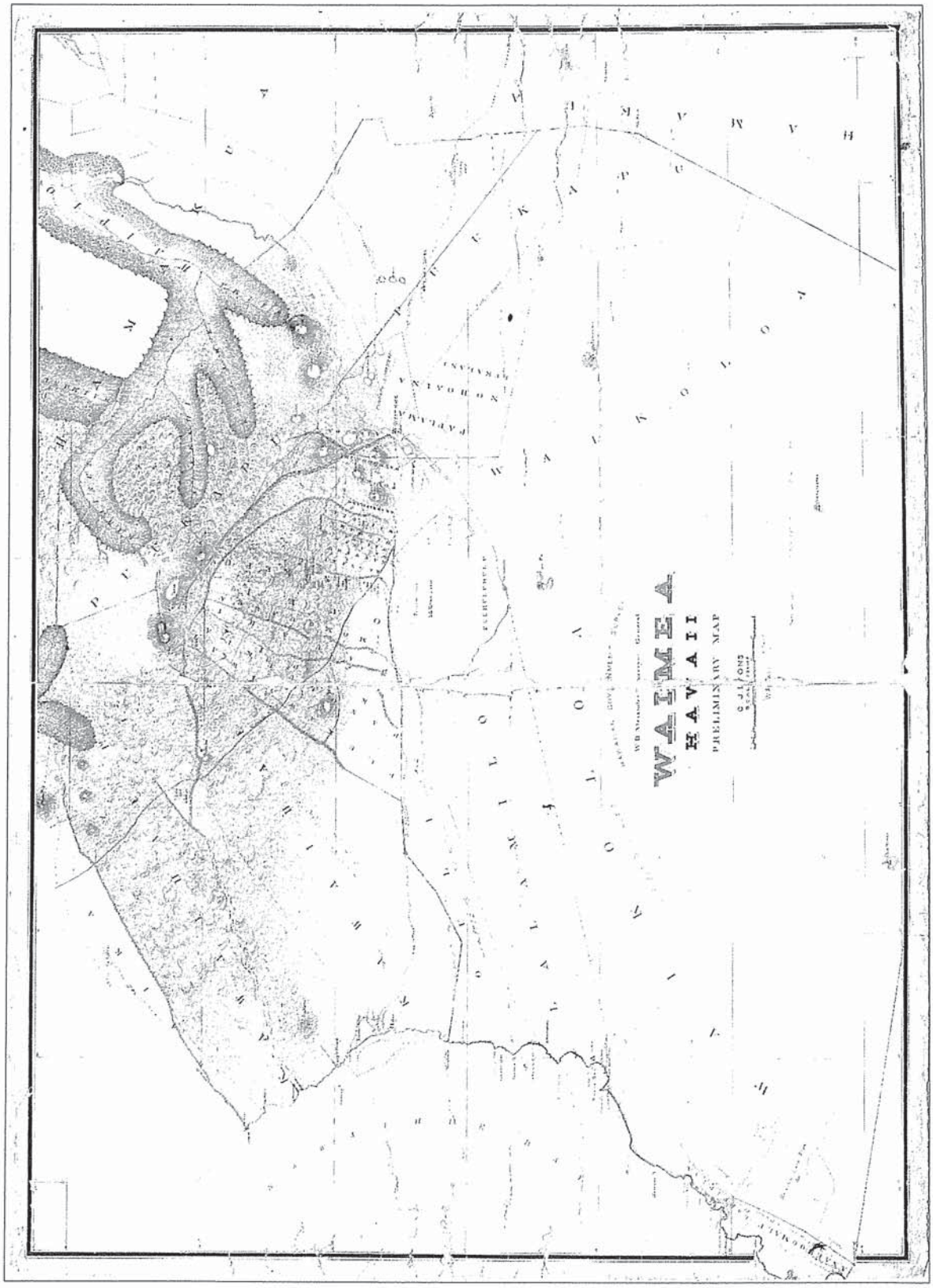

Figure 14. Hawai'i Registered Map No. 1080 showing *kalana* of Waimea with Waikōloa Ahupua'a as it is appears today.

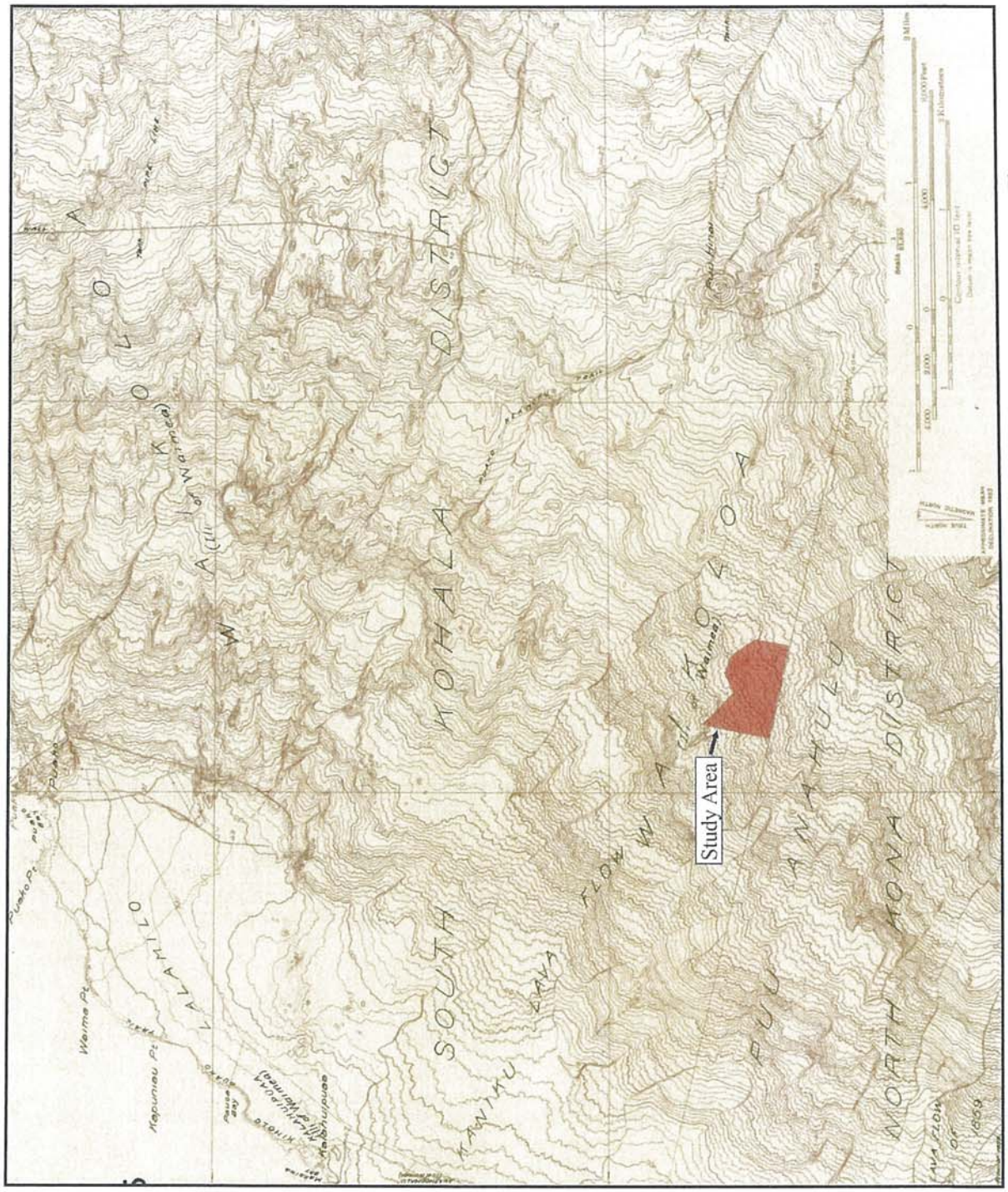

Figure 15. Portion of the 1923 U.S.G.S. Pu'u Hinai quadrangle showing the current study area within Kanikū Lava Flow.

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

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

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

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

> After Kama-Iala-walu's warriors reached the grassy plain, they looked seaward on the left and beheld the men of Kona advancing toward them. The lava bed of Kaniku and all the land up to Hu'ehu'e was covered with the men of Kona. Those of Ka'u and Puna were coming down from Mauna Kea, and those of Waimea and Kohala were on the level plain of Waimea [Waikōloa]. The men covered the whole of the grassy plain of Waimea like locusts. Kamalalawalu with his warriors dared to fight. The battlefield of Pu'oa'oaka was outside of the grassy plain of Waimea, but the men of Hawaii were afraid of being taken captive by Kama, so they led [Kamalalawalu's forces] to the waterless plain lest Maui's warriors find water and hard, waterworn pebbles. The men of Hawaii feared that the Maui warriors would find water to drink and become stronger for the slinging of stones that would fall like raindrops from the sky. The stones would fall about with a force like lightning, breaking the bones into pieces and causing sudden death as if by bullets . . .
>
> . . . The Maui men who were used to slinging shiny, water-worn stones grabbed up the stones of Pu'oa'oaka. A cloud of dust rose to the sky and twisted about like smoke, but the lava rocks were light, and few of the Hawaii men were killed by them. This was one of the things that helped to destroy the warriors of Kama-lala-walu: They went away out on the plain where the strong fighters were unable to find water . . . The warriors of Maui were put to flight, and the retreat to Kawaihae was long. [Yet] there were many who did reach Kawaihae, but because of the lack of canoes, only a few escaped with their lives ... Kamalalawalu, ruler of Maui, was killed on the grassy plain of Puako, and some of his chiefs were also destroyed. (Kamakau 1991:58-60)

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

During this time of warfare, and following the death of Keawe, Kamehameha was born in North Kohala District in the *ahupua'a* of Kokoiki, near the *heiau* of Mo'okini (Kamakau 1992). There is some controversy about the year of his birth, but Kamakau (1992) places the birth event sometime between A.D. 1736 and 1758, most likely nearer to the later date. Kamehameha's ancestral homeland was in Hālawa, North Kohala District (Williams 1919).

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

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

History After Contact

The arrival of Western explorers in Hawai'i marked the end of the Precontact Period and the beginning of the Historic Period. With the arrival of foreigners, Hawai'i's culture and economy were drastically altered. Demographic trends during this period indicate population reduction in some areas, due to war and disease, yet increases in others, with relatively little modification of material culture. 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 (Kirch 1985; Kent 1983). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha I had conquered O'ahu, Maui and Moloka'i, in 1795, Hawai'i had seen the beginnings of a market system economy (Kent 1983). Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, potatoes, corn, beans, figs, oranges, guava, and grapes (Wilkes 1845). Later, as the Historic Period progressed, Kamehameha I died, the *kapu* system was abolished, Christianity established a firm foothold in the islands, and introduced diseases and global economic and political forces began to have a devastating impact on traditional Hawaiian lifeways. This marked the end of the Proto-Historic Period and the decline of the uniquely innovative Hawaiian culture.

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

British explorer Captain James Cook, in command of the ships *H.M.S. Resolution* and *H.M.S. Discovery*, first landed in the Hawaiian Islands on January 18, 1778. The following January, Cook returned to Kealakekua Bay in South Kona District during the annual *Makahiki* festival. According to John Ledyard, a British marine on board Cook's ship, more than 15,000 inhabitants were present at the bay at that time, and as many as 3,000 canoes came out to greet the ships (Jarves 1847). It has been suggested that Captain Cook was mistaken for the returned god Lono himself, as men would not normally be allowed to paddle out during the *Makahiki* without breaking the *kapu* and forfeiting all of their possessions (Kamakau 1992). Cook set sail shortly thereafter but a storm forced him to return to return to Kealakekua Bay for repairs. Cook's return set off a series of unfortunate events that ended in Cook's death along with four of his men and several natives on the shores of Ka'awaloa (Kamakau 1992).

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

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

After the death of Captain Cook and the departure of the *H.M.S. Resolution* and *Discovery*, Kalani'ōpu'u moved to Kona (Kamakau 1992). When famine struck in Kona District, Kalani'ōpu'u ordered that all the cultivated products in Kona be seized. He then set out on a circuit of the island; his first stop was Hinakahua in Kapa'au, North Kohala. During his stay in Kohala, Kalani'ōpu'u proclaimed that his son Kiwala'ō would be his successor, and he gave the guardianship of the war god Kūka'ilimoku to Kamehameha. However, Kamehameha and a few other chiefs were concerned about their land claims, which Kiwala'ō did not seem to honor (Fornander 1996; Kamakau 1992). The *heiau* of Moa'ula was erected in Waipi'o at this time (ca. 1781), and after its dedication Kalani'ōpu'u set out for Hilo to quell a rebellion by a Puna chief named Imakakolo'a.

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

The Rule of Kamehameha I (1782-1819)

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

When construction of Pu'ukoholā Heiau was completed in the summer of 1791, Kamehameha sent two of his counselors, Keaweaheulu and Kamanawa, to offer peace to Keōua. Keōua was enticed to the dedication of the Pu'ukoholā 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 about 1792 (Greene 1993). Between 1792 and 1796 Kamehameha mostly resided at Kawaihae and worked the lands of the Waikōloa-Waimea region (Maly and Maly 2002). By 1796, Kamehameha had conquered all the island kingdoms except for Kaua'i. It wasn't until 1810, when Kaumuali'i of Kaua'i gave his allegiance to Kamehameha, that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976).

In the twelve years following the death of Captain Cook, sixteen foreign ships (all British and American) visited Hawaiian waters (Restarick 1927). In 1790, two sister ships, the *Eleanora* and the *Fair American*, were trading in Hawaiian waters when a skiff was stolen from the *Eleanora* and one of its sailors was murdered. The crew of the *Eleanora* proceeded to slaughter more than 100 natives at Olowalu on Maui. After leaving Maui, the *Eleanora* sailed to Hawai'i Island, where one of its crew, John Young, went ashore and was detained by Kamehameha's men. The other vessel, the *Fair American,* was captured by the forces of Kamehameha off the coast of North Kona, and in an

act of retribution for the Olowalu massacre, they slaughtered all but one crew member, Isaac Davis. Guns and a cannon (later named "Lopaka") were recovered from the *Fair American*, and were kept by Kamehameha as part of his fleet (Kamakau 1992). Kamehameha made John Young and Isaac Davis his advisors.

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

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

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

Around the turn of the century, Kamehameha gave control of present day Waikōloa then Waikōloa Nui Ahupua'a (excluding the coastal *'ili* of 'Anaeho'omalu and Kalāhuipua'a) to Isaac Davis (Rosendahl 2000). Although the land of Waikōloa Nui gifted to Davis encompassed a large area, it lacked extensive resources, and was primarily a place for catching birds and gathering *pili* grass. When Davis died in 1810 without naming an heir, John Young took control of the land and protected it for Davis' children, who were at that time too young to take on the responsibility (Rosendahl 2000).

Waikōloa Nui would eventually become a favored pasture for the cattle given by Vancouver to Kamehameha. By the early nineteenth century the *kapu* cattle quickly multiplied in the region to the extent that they became a scourge for the native planters of the Waimea area. In order to protect the upland agricultural fields from the overwhelming number of grazing cattle, sometime between 1813 and 1819, Kamehameha ordered the construction of a wall extending from the northern boundary of Waikōloa Nui to near Pu'u Huluhulu (Barrère 1983). The wall was designed to keep wild cattle in Waikōloa Nui and out of the more agriculturally productive areas on the Waimea side. The wall was called *Pā* of Kauliokamoa after the *konohiki* who oversaw its construction (Wolforth 2000).

During the first part of the nineteenth century, Hawaiian culture and economy continued their radical transformation as capitalism and industry established a tight grip on the islands. The sandalwood (*Santalum ellipticum*) trade, established by Euro-Americans in 1790 and turned into a viable commercial enterprise by 1805, was flourishing by 1810 (Oliver 1961). This added to the breakdown of the traditional subsistence system, as farmers and fishermen were ordered to spend most of their time logging, which resulted in food shortages and famine and eventually led to population decline. Kamehameha, who resided on the Island of O'ahu at this time, did manage to maintain some control over the trade on Hawai'i Island (Kuykendall and Day 1976; Kent 1983).

Upon returning to Kailua in 1812, Kamehameha ordered men into the mountains of Kona to cut sandalwood and carry it to the coast, paying them in cloth, *tapa* material, food and fish (Kamakau 1992). Kamakau indicates that:

> this rush of labor to the mountains brought about a scarcity of cultivated food . . . The people were forced to eat herbs and tree ferns, thus the famine [was] called Hi-laulele, Haha-pilau, Laulele, Pualele, 'Ama'u, or Hapu'u, from the wild plants resorted to. (1992:204)

Once Kamehemeha realized that his people were suffering, he declared all the sandalwood to be government property and ordered the people to return to their cultivation of the land and devote only part of their time to sandalwood production (Kamakau 1992). In the uplands of Kailua, a vast plantation named Kuahewa was established where Kamehameha himself worked as a farmer. Kamehameha enacted the law that anyone who took one corm of taro or one stalk of sugarcane must plant one cutting of the same in its place (Handy and Handy 1991). While in Kailua, Kamehameha resided at Kamakahonu, from where he continued to rule the islands for another nine years. He and his high chiefs participated in foreign trade, but also continued to enforce the rigid *kapu* system.

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

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

> The death of Kamehameha was the first step in the ending of the tabus; the second was the modifying of the mourning ceremonies; the third, the ending of the tabu of the chief; the fourth, the ending of carrying the tabu chiefs in the arms and feeding them; the fifth, the ruling chief's decision to introduce free eating (*'ainoa*) after the death of Kamehameha; the sixth, the cooperation of his aunts, Ka-ahu-manu and Ka-heihei-malie; the seventh, the joint action of the chiefs in eating together at the suggestion of the ruling chief, so that free eating became an established fact and the credit of establishing the custom went to the ruling chief. This custom was not so much of an innovation as might be supposed. In old days the period of mourning at the death of a ruling chief who had been greatly beloved was a time of license. The women were allowed to enter the heiau, to eat bananas, coconuts, and pork, and to climb over the sacred places. You will find record of this in the history of Ka-ula-hea-nui-o-ka-moku, in that of Ku-ali'i, and in most of the histories of ancient rulers. Free eating followed the death of the ruling chief; after the period of mourning was over the new ruler placed the land under a new tabu following old lines. (Kamakau 1992: 222)

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

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

The indefinite period of free-eating initiated by Liholiho and his failure to reinstate the *kapu* system from Hawai'i to Kaua'i made the traditional religion of Hawai'i vulnerable to the Christian missionaries who began to arrive shortly thereafter. As a result, within one year after Kamehameha I's death Christianity had officially replaced the native Hawaiian religious practices. By December of 1819, Kamehameha II had sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the *'aumakua* worship, to continue (Oliver 1961; Kamakau 1992). With the end of the *kapu* system, modifications in the social and economic patterns began to affect the lives of the common people.

Kohala 1820-1848: A Land in Transition

In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawai'i and arrived in Kailua-Kona on March 30, 1820. Many of the *ali'i*, who were already exposed to western material culture had adopted their dress and religion and welcomed the opportunity to become educated in a western style. Soon they were rewarding their teachers with land and positions in the Hawaiian government. During this period, the sandalwood trade wreaked further havoc on the lives of the commoners, as they weakened from the heavy production, exposure, and famine just to fill the coffers of the *ali'i*, who were no longer under any traditional constraints (Oliver 1961; Kuykendall and Day 1976). The lack of control of the sandalwood trade was to soon lead to the first Hawaiian national debt as promissory notes and levies were initiated by American traders and enforced by American warships (Oliver 1961). The Hawaiian culture

was well on its way towards Western assimilation as industry in Hawai'i went from the sandalwood trade, to a short-lived whaling industry, and gave way to the more lucrative, but environmentally destructive sugar industry.

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

> About eleven at night we reached Towaihae [Kawaihae], where we were kindly received by Mr. Young. . . . Before daylight on the 22nd, we were roused by vast multitudes of people passing through the district from Waimea with sandal-wood, which had been cut in the adjacent mountains for Karaimoku, by the people of Waimea, and which the people of Kohala, as far as the north point, had been ordered to bring down to his storehouse on the beach, for the purpose of its being shipped to Oahu. There were between two and three thousand men, carrying each from one to six pieces of sandal-wood, according to their size and weight. It was generally tied on their backs by bands of ti leaves, passed over the shoulders and under the arms, and fastened across their breasts. (Ellis 2004:405-406)

The population of South Kohala continued to reside either near the shore or in the uplands of Waimea throughout the first half of the nineteenth century, but as previously discussed, the arrival of foreigners, their introduction of a western economy, and the rise of the sugar and cattle industries had a profound impact on daily life in Kohala. Even the landscape of Waimea was substantially altered; initially through deforestation associated with the sandalwood trade, followed by the effects of countless grazing cattle (Rechtman and Prasad 2006). A network of stone walls began to appear as a way for people to keep feral cattle out of their gardens and house lots. Commercial ventures soon replaced traditional agricultural practices and introduced crops (Irish potatoes, watermelons, cabbage, onions, tomatoes, mulberries, figs, and beans) were grown to replenish the cargo ships at Kawaihae Harbor; and in the late 1840s many of the potatoes grown in the Waimea area were shipped to California to help feed the gold rush (Haun et al. 2003). In addition, a sugar mill operated in the Waimea area from the 1820s until the 1840s.

The 1835 missionary census lists 6,175 people living in Kohala and another 1,396 people, including 500 men, 510 women, and 386 children, living in Waimea (Schmitt 1977). In 1837 there were sixty foreigners in Waimea employed as mechanics and bullock hunters (Brundage 1971); and in his report to the American Board of Commissioners to Foreign Missions in 1840, Lorenzo Lyons stated "in my field are sixty or seventy foreigners, from seven or eight different nations. They are beef catchers, sugar manufacturers, shoe makers, merchants, masons, doctors, formers, and what not" (Doyle 1953:118). By 1840, bullock hunting had drastically reduced the population of wild cattle on Hawai'i Island, so much so that a five year *kapu* was placed on hunting them solely for their hides and tallow (Bergin 2004). This lead to further efforts to tame, brand, fence, and herd privately owned cattle (Wilkes 1845). The decline of the whaling industry in Hawaiian waters during this time, combined with the *kapu* on killing wild cattle, lead to a period of economic hardship and population decline in the Waimea area (Escott 2008).

By the mid-nineteenth century, the agriculturally marginal areas of leeward Kohala were abandoned in favor of more productive and wetter lands in windward Kohala. According to Tomonari-Tuggle (1988), the remnant leeward population was concentrated into a few small coastal communities (such as Puakō, located roughly 5 miles northwest of the current study area) and dispersed upland settlements. These settlements were no longer based on traditional subsistence patterns, largely because of the loss of access to the full range of necessary resources. As a result, the windward slopes of North Kohala and the Waimea plain eventually became the population centers for the district. Tomonari-Tuggle clarifies some of the reasons for this migration:

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

The population of the district of Kohala declined rapidly as native populations were decimated by disease and a depressed birth rate. Postcontact epidemics in 1848 and 1849 killed more than 10,000 people in twelve months

throughout the Hawaiian Islands (Tomonari-Tuggle 1988). In 1848 in North Kohala, Rev. Bond reported that 100 people had died within a three week period, and in October of that year he reported that a measles epidemic had nearly every resident of the district in the hospital (Damon 1927). Following these epidemics, the population of the district had been reduced to nearly half of the more than 6,000 people reported in the 1835 census (Schmitt 1977). The number of coastal residents soon dwindled and most of the coastal villages were inhabited by only a few solitary residents. An 1848 description of the town of Waimea cited by McEldowney stated that "it can scarcely be said that there is any native population at all."(1983:432). This statement seems to sum up the devastating demographic changes that were taking place as the native population had been reduced by disease, displacement, and ongoing revisions in land tenure.

Legacy of the Great Māhele (1848-1895)

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

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

The disposition and distribution of the lands of Waimea was rather complicated and was under dispute between the Boundary Commissioners, *kama'āina* informants, and land petitioners. Waimea was a discrete land unit (see Figure 13) considered to be a *kalana* (county) or *'okana* (subdistrict) as opposed to an *ahupua'a* (Pukui and Elbert 1986). To further confound the issue, some of the land units within Waimea were considered *ahupua'a* while others were considered *'ili kūpono*, defined by Puhui and Elbert as "A nearly independent *'ili* land division within an *ahupua'a* paying tribute to the ruling chief and not the chief of the *ahupua'a*. Transfer of the *ahupua'a* from one chief to another did not include the *'ili kūpono* located within its boundaries" (1986:98). As a result of the *Māhele* and Boundary Commission testimonies, many smaller *ahupua'a* names were dropped and the *'ili kūpono* were given *ahupua'a* status; the majority of the Waimea area was retained as Crown Lands, with the exception of a portion of Waikōloa Ahupua'a that was awarded as *Konohiki* Lands. Over 140 claims for Land Commission Awards (LCAw.) were made by native tenants within the Waimea area. Nearly all of these claims were for house lots or cultivated sections (Haun et al. 2003). Of the land commission awards reviewed by Kelly and Nakamura (1981:30), over twenty percent were issued to persons with non-Hawaiian surnames.

During the *Māhele*, Waikōloa (Nui) Ahupua'a was awarded to George Davis Hū'eu (LCA 8521-B; see Figure 2), son of Isaac Davis, one of Kamehameha I's trusted advisors. According to Wolforth et al. (2005), Kamehameha I had given Davis the land as a reward for his service, but after Davis died prematurely under suspicious circumstances in 1810, his friend John Young (another advisor to Kamehameha I) took it upon himself to make sure that Isaac Davis' children would receive their father's lands when they came of age. A portion of Young's Last Will and Testament read as follows (Cahill 1999:167):

> ... I give and bequeath to be equally divided between my surviving children and the surviving children of my departed friend, the late Isaac Davis, of Milford in England, in such manner as it may please His Majesty the King and his Chiefs; Provided always that each and all of the said children receive a just and equal portion. (reproduced in Wolforth et al. 2005:12)

As a result, John Young's lands were designated *'ina ho'oilina* or inherited lands, during the *Māhele*, a designation applied only to these lands that does not appear elsewhere in the *Māhele* records (Wolforth et al 2005).

Royal Patent number 5671 was issued to Isaac Davis that consisted of a large area of dry, non-arable terrain on

grassy slopes known as *pili* lands (after the pili plant that grew in abundance there), which extended to the *'a'ā* on the Kona District boundary; and did not include any portion of the fertile uplands or shoreline access (Wolforth et al. 2005). In 1865, George Hū'eu, Davis's only surviving heir, received Waikōloa as an unsurveyed Land Commission Award.

> We consider it clear that in making the grant the King intended to give, and did give to Isaac Davis, a tract of land of very great extent, although not of proportionate value, There were no cattle or sheep in this country when the grant was made, and the land given to Isaac Davis only yielded what revenue could be derived from wild birds and pili grass (Boundary Commission 1867 in Wolforth et al 2004:13)

In 1868, George Hū'eu leased his remaining lands in Waikōloa to the Waimea Grazing and Agricultural Company, which made them the largest ranching operation on the island (Escott 2008). Under the terms of the lease, the Hū'eu family was allowed to continue grazing their 1,000 head of cattle, 1,000 head of sheep, and 100 horses there (Escott 2008). By the late-1870s, largely due to persistent drought conditions within its grazing lands, the Waimea Grazing and Agricultural Company went out of business; Parker Ranch purchased their herd and acquired their lease for roughly 95,000 acres of Waikōloa. A sketch map prepared by J. S. Emerson in 1882 during the Hawaiian Government Survey of South Kohala (Figure 16), shows the Parker Ranch grazing lands and the network of trails that ran through them.

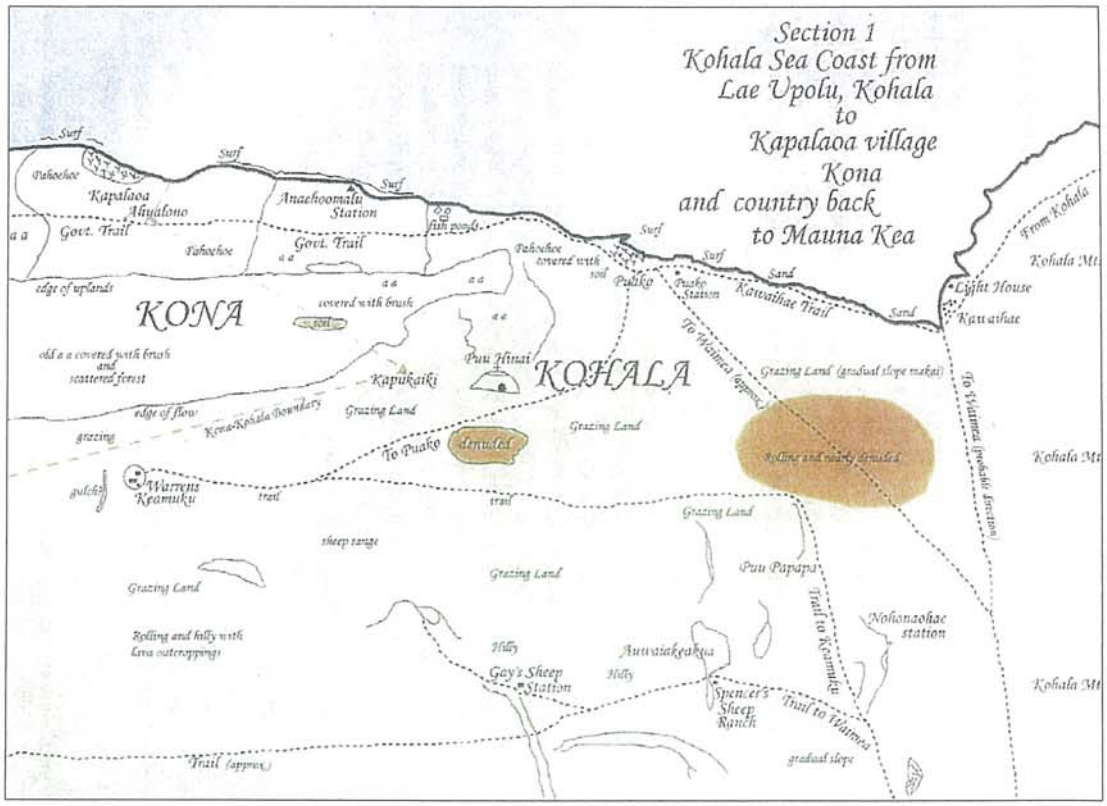

Figure 16. Emerson sketch map of South Kohala coast ca/ 1882 (from Escott 2008:43).

The coastal areas of Waikōloa, 'Anaeho'omalu and Kalāhuipua'a had been passed from Kamehameha I to Kamehameha II and then to Kamehameha III who retained them as Crown Lands until he passed them on to his wife Queen Kalama (LCA 4452; Wolforth et al. 2005). Only nine small residential *kuleana* were awarded in the uplands of Waikōloa near the town of Waimea and none were awarded within or in close proximity to the current study area (Maly 1999). Coastal residents in South Kohala, relied primarily on the ocean for sustenance, and they augmented their diet with produce procured through trade with the upland areas. In addition, according to testimony from 1865 Boundary Commission hearings, Waikōloa Ahupua'a was known as a place for bird catching; Ehu testified, "Waikōloa was the land that had the birds" (Maly 1999:88).

In the decades following the *Māhele* of 1848, the population along the Kohala coast continued to decline and the remnant inland agricultural fields were abandoned as they succumbed to the ravages of free-range cattle or were bought up by ranching and sugar interests. The remaining tenants built *kuleana* walls to enclose their homes, gardens, and domesticated animals in an effort to keep free-ranging animals out of their property and also to mark property boundaries as part of the new land tenure system (Tomonari-Tuggle 1988). The economy also transitioned, becoming cash based and taxes were collected. Foreigners controlled much of the land and most of the businesses, and the native population was largely dependent on these foreigners for food and money (Haun et al. 2003). By the early 1860's, Western Contact had made its inevitable mark on Kohala, but the community remained essentially Hawaiian in nature, and foreigners were still only a small minority in actual numbers (Tomonari-Tuggle 1988).

Oral histories indicate that a dry land planting area referred to as Makahonu was present in Waikōloa near the intersection of Waikōloa Road and Queen Ka'ahumanu Highway, *makai* of the current study area. There is no information in the oral histories of what was specifically cultivated in the planting area although 'Anaeho'omalu and other proximal locations were favorable areas for growing sweet potatoes (Handy and Handy 1991). According to Maly, Makahonu "was still used through the turn of the [twentieth] century" (1999:153).

The Study Area Vicinity during the Twentieth Century

Between the years of 1895 and 1913, the Puakō Sugar Plantation and Mill operated on 1800 acres along the bay in Puakō (Puakō Hisotrical Society). This short-lived operation was run by the Hinds who also founded the Hāwī Mill and Plantation in North Kohala and included leased portions of the Parker Ranch. The Plantation and Mill were forced to close as a result of damaging floods, the lack of freshwater and the high winds that plagued the area (John Hind n.d.). While operational, the Puakō Sugar Plantation led to an influx of population in the area and helped spur the development of roadways connecting Puakō with Kawaihae and Waimea. Upon cessation, the leased lands reverted back to Parker Ranch. The landholdings of Parker Ranch continued to grow as then manager Alfred W. Carter acquired thousands of acres in Waikōloa and neighboring *ahupua'a* that included the Pu'uloa Sheep and Stock Company, which encompassed over 3,700 acres and the Ke'amuku Sheep Station in Waikōloa. Over the next decade these lands were converted to cattle ranching. By 1932, Parker Ranch had grown to include over 325,000 acres of fee lands (Bergin 2004). With the expansion of ranching operations, population also expanded in Waimea.

In December of 1943, nearly 123,000 acres of land in the Waimea-Waikōloa area were leased by the U. S. War Department for use as a troop training area (Escott 2008). The U.S. Military's 91,000-acre Waikōloa Maneuver Area was the site of an artillery firing range on which live ammunition and other explosives were employed, with the remaining acreage utilized for troop maneuvers. The Waikōloa Manuever Area extended from the coast to present-day Pohakuloa Training Area, and from the Waimea-Kawaihae Road to south of Waikoloa Road, where the current study area is located. According to Escott:

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

In September of 1946, the Waikōloa Maneuver Area, with the exception of the 9,141 acre Lālāmilo Firing Range, was returned to Parker Ranch (Haun et al. 2010). When the use permit was cancelled in December of that year, the lands once again reverted to leased cattle pasture administered by the Territory of Hawai'i. Following World War II, the lands in the vicinity of the current study area were once again used for cattle ranching and bird hunting; however, clean-up of unexploded ordnance within the Waikōloa Maneuver Area is still ongoing.

Since the 1950s modern development, concentrated along the coast and around the Villages of Waimea and Waikōloa, north of current study area. In 1949-50 the coastal lands of Puakō were divided into the Puakō Beach Lots and a road was built to Kawaihae, which brought many new residents to the area (Maly 1999). During the 1970s the current alignment of Queen Ka'ahumanu Highway (Highway 19), extending from Kailua to Kawaihae, was constructed across the coastal sections of Waikōloa *ahupua'a*; Waikōloa Road was built to connect the new lower highway with the upper highway (Highway 190); and Waikōloa Village was established about 3.5 miles northeast of the current study area. With the construction of the new highways and the shifting residential patterns, the older coastal roads and *mauka/makai* travel routes largely fell into disuse.

PRIOR ARCHAEOLOGICAL STUDY

The current study area was included in a 1991 archaeological inventory survey of a roughly 300-acre property conducted by PHRI (Jensen and Burgett 1991) for a then proposed quarry location. PHRI identified nineteen sites and established an archaeological preserve with a fifty foot buffer zone, which led to the definition of the current quarry parcel. The archaeological preserve is located on TMK: (3) 6-8-001:067 immediately to the north of the current study area (Figure 17).

The 1991 PHRI archaeological investigation consisted of 100 percent aerial survey at 30-50 feet altitude via helicopter augmented by pedestrian survey of 15-20 percent of the property in areas identified as high probability with respect to the presence of historic properties. Nineteen sites were recorded (Table 1) along the top and around the margins of two *'a'ā* ridges located within the northern third of their study area (to the north of the current study area). These sites appeared to be interconnected by a poorly defined trail system, which was likely only minimally used at the time the features were constructed and for limited access thereafter. No midden, artifacts, or other portable cultural material were detected on the surface of any of the features or in the subsurface testing of a rock shelter feature (SIHP Site 15051B).

Table 1. Sites in archaeological preserve north of the study area.*

SIHP Site No.	*# of Features*	*Feature Type*	*Function*
15030	2	(A) Mound (B) Paving	Possible burial
15031	1	Rock shelter	Temporary habitation
15032	1	Platform	Possible burial/ceremonial
15050	1	Platform	Possible burial/ceremonial
15051	4	(A)Platform (B) Rock shelter (C) Modified sink (D) Terrace	Temporary habitation with possible burial(s)
15052	4	(A-D) Platforms	Possible burial/ceremonial
15053	1	Platform	Possible burial
15054	1	Platform	Possible burial
15055	1	Platform	Possible burial
15056	1	Platform	Possible burial/ceremonial
15057	2	(A and B) Platforms	Possible burial/ceremonial
15058	1	Modified outcrop	Indeterminate
15059	1	Trail	Transportation
15060	1	Platform	Possible burial
15061	1	Platform	Possible burial
15062	1	Rock shelter	Temporary habitation
15063	1	Filled blister	Possible burial
15064	1	Terrace	Possible burial
15065	1	Rock shelter	Temporary habitation

*Data source is Jensen and Burgett (1991).

As a result of the PHRI investigation, all nineteen sites were preserved "as is". The Waikoloa Development Company chose not to proceed with any additional data recovery or further evaluation at that time. As previously discussed, a buffer zone of fifty feet was created around the area where the archaeological features were found, and an archaeological preserves was created on the parcel (TMK: (3) 6-8-001:067) to the north of the current study area.

In May of 1999, PHRI conducted archaeological monitoring for the development of the quarry site and associated access road. In a letter report, PHRI (Rechtman 1999) confirmed that the established buffer zone was maintained: the access road was well *makai* of the buffer boundary and the northern boundary of the quarry (the current study area) was placed an additional 50 meters south of the buffer zone.

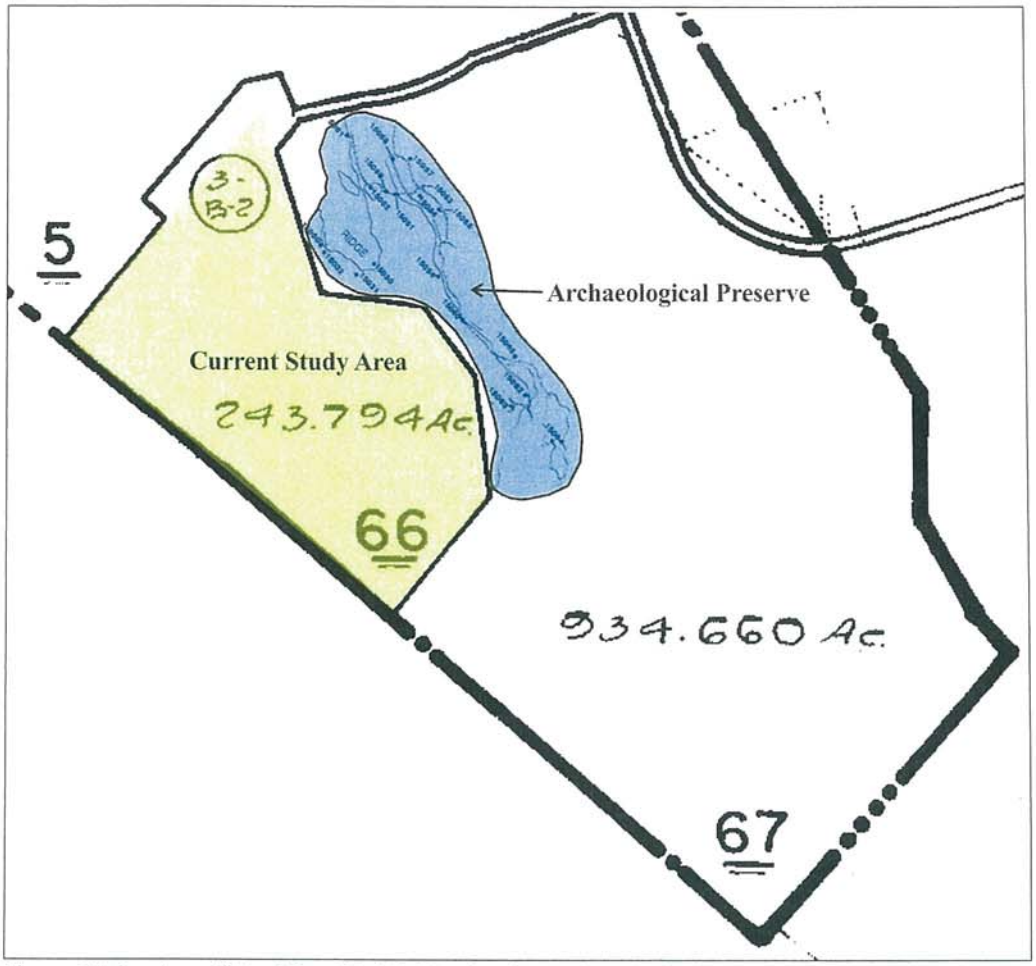

Figure 17. Portion of Tax Map (3) 6-8-001 showing archaeological preserve and current study area.

3. STUDY AREA EXPECTATIONS

Given the recent specific land use history (quarrying activity throughout roughly 95% of the study area), intact archaeological resources if extant could only be identified around the periphery of the land disturbance. Also given that the current study area was investigated for archaeological sites prior to the establishment of the quarry, with negative results, the expectation for finding archaeological sites is extremely low. Based on ethnohistoric and prior archaeological information, the types archaeological features that could exist in this area might be related to the procurement of specific resources, such as *pili* grass and birds (such features would include trails and temporary shelters), or related to burial activities (such features would include platforms, pavements, and trails). There is also the possibility of identifying Historic Period ranching features (trails and enclosures), and evidence of middle twentieth century military activity (enclosures and debris scatters).

4. FIELDWORK

On May 20, 2015, Robert B. Rechtman, Ph.D., Teresa Gotay, M.A. and Layne Krause, B.A. performed a field survey of the study area, which included a visual inspection of the existing quarried areas (roughly 95% of the study area) and a pedestrian survey of the limited undeveloped and minimally disturbed portions of the study area along the periphery of the quarry operation (Figures 18 and 19). In the undeveloped periphery of the study area, field investigators walked north-south transects approximately 25 meters apart; weather conditions and ground visibility were conductive for thorough observation of the terrain.

No archaeological features or portable cultural material was encountered during the pedestrian survey of the study area. A small amount of metal shrapnel was observed during the current fieldwork. This debris is likely related to the former use of the Waikōloa Maneuver Area (ca. 1943-1946) by the U.S. Military.

Figure 18. Minimally disturbed section in the northeastern portion of the current study area.

Figure 19. Small section of unquarried area in the southeastern portion of the study area.

5. CONCLUSION AND RECOMMENDATIONS

Given the negative findings of the current study, supported by similar findings of the prior archaeological study (Jensen and Burgett 1991) that included the current study area, it is concluded that the proposed extension and amendment to the existing Special Permit will not significantly impact any known historic properties. No further historic preservation work is recommended at this time.

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