

Cultural Impact Assessment for the Kapāpala Koa Canoe Management Area

TMK (3) 9-8-001:014

Kapāpala Ahupua‘a
Ka‘ū District
Island of Hawai‘i

FINAL VERSION



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March 2023

ASM Project Number 39580.00



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1. INTRODUCTION

At the request of Forest Solutions Inc. on behalf of the State of Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW), ASM Affiliates (ASM) has prepared this Cultural Impact Assessment (CIA) to inform a Hawai‘i Revised Statutes Chapter 343 Environmental Assessment (EA) being prepared for the Kapāpala Koa Canoe Management Area (KKCMA). The KKCMA is synonymous with Tax Map Key (TMK) (3) 9-8-001:014 (1-B), a 1,257-acre agricultural-zoned parcel (referred to hereafter as the ‘project area’) that is a part of the Ka‘ū Forest Reserve, in Kapāpala Ahupua‘a, Ka‘ū District, Island of Hawai‘i (Figures 1, 2, and 3). The primary purpose of the KCCMA is to provide for sustainable production and supply of *koa* (*Acacia koa*) for the construction of *koa* canoes used customarily for fishing, outrigger canoe racing, and voyaging. Secondary management objectives include native forest protection, protection of watershed resources, protection of forest bird habitat, collaboration with educational and community groups, access for certain recreational activities, and integration of traditional Hawaiian stewardship models with Western conservation practices.

This CIA, which is intended to inform an EA conducted in compliance with HRS Chapter 343, is being prepared pursuant to Act 50 and in accordance with the Environmental Review Program (formerly known as the Office of Environmental Quality Control [OEQC]) *Guidelines for Assessing Cultural Impacts*, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997 (OEQC 1997). Act 50, which was proposed and passed as Hawai‘i State House of Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, specifically acknowledges the State’s responsibility to protect native Hawaiian cultural practices. Act 50 further states that environmental studies “... should identify and address effects on Hawaii’s culture, and traditional and customary rights” and that “native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the ‘aloha spirit’ in Hawai‘i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.”

The current report is divided into four main chapters. Chapter 1, the introduction, includes an overview of the proposed KKCMA project as well as a physical description of the project area. To provide a cultural context of the project area and traditional Hawaiian canoe carving practices, Chapter 2 begins with a historical review of traditional practices and beliefs associated with *koa* harvesting and canoe making. This chapter also includes cultural-historical background information specific to the project area and the broader geographical region of Kapāpala, and at times the greater Ka‘ū District. This chapter also includes a summary of prior archaeological and cultural studies that have been conducted within or near the project area. The methods and results of the consultation process are then presented in Chapter 3. Lastly, Chapter 4 includes a discussion of potential cultural impacts as well as actions and strategies that may help to mitigate any identified impacts.

1. Introduction

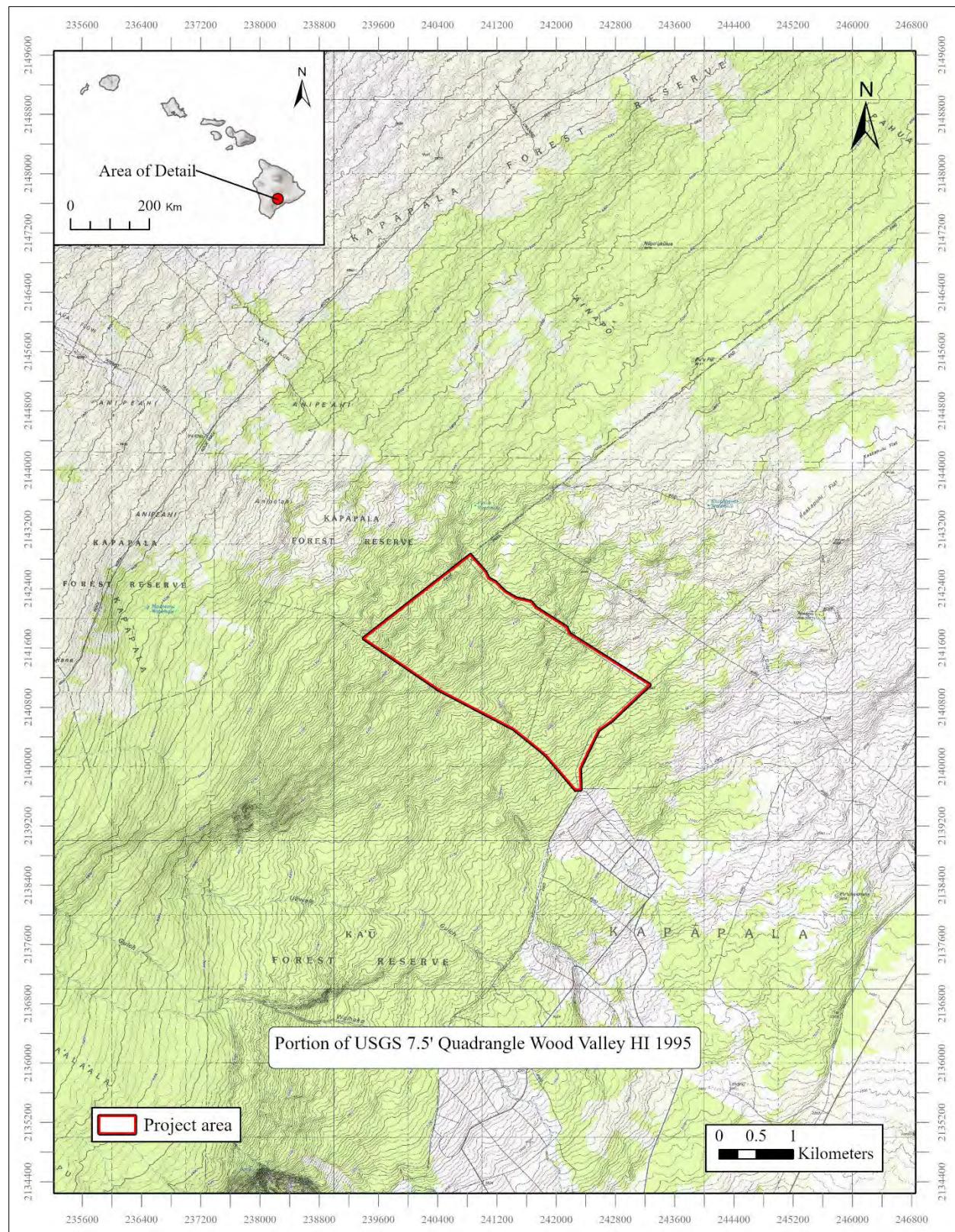


Figure 1. Project area location.

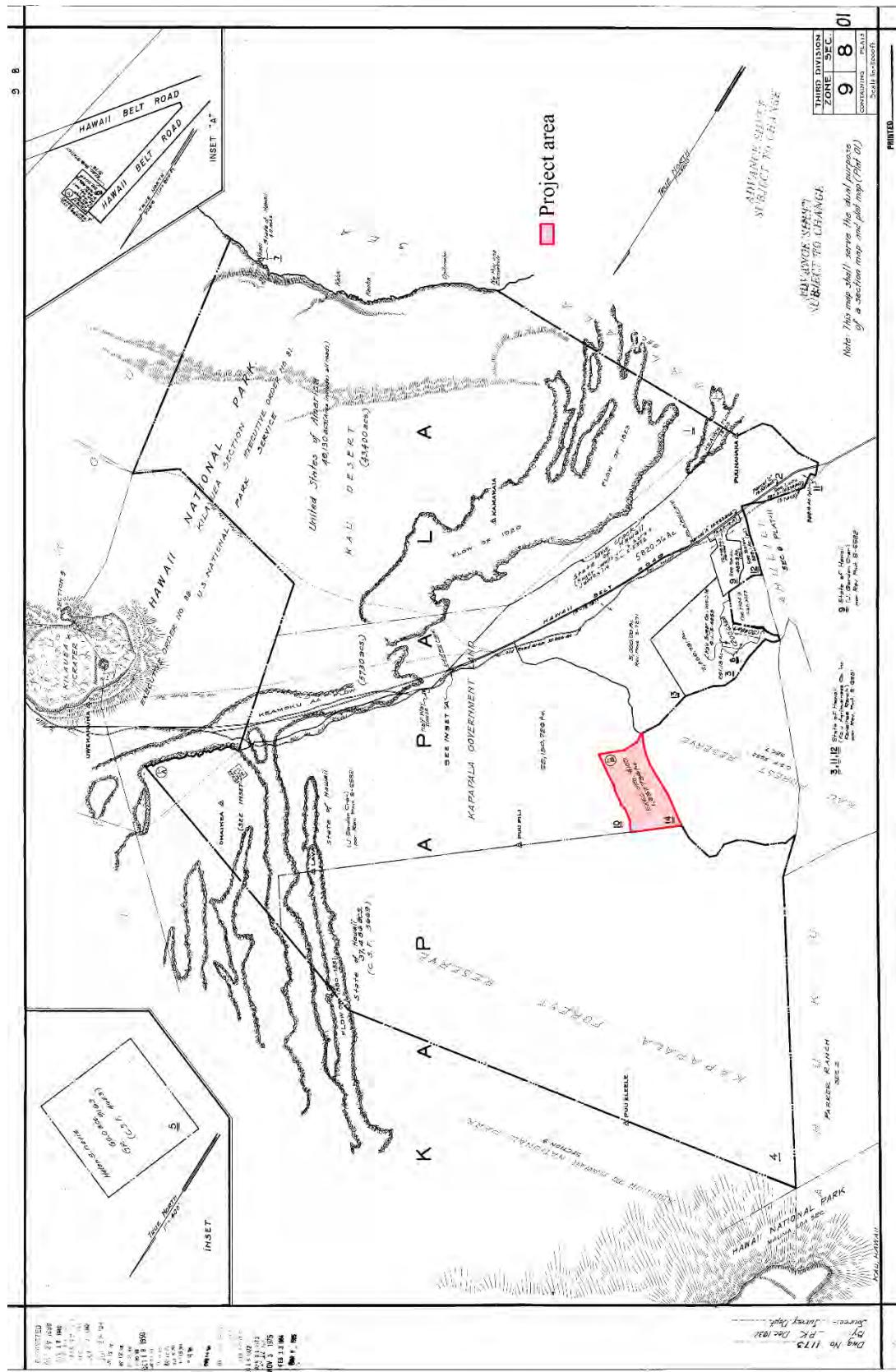


Figure 2. Tax Map (3) 9-8-01 showing project area located within Parcels 014 (1-B).

1. Introduction



Figure 3. Google Earth™ satellite image showing project area location.

PROJECT AREA DESCRIPTION

The project area is situated along the eastern slopes of Mauna Loa between roughly the 1,132-meter (3,713 feet) and 1,552-meter (5,091 feet) elevation in Kapāpala Ahupua‘a, Ka‘ū District. The 1,257-acre KKCMA project area is within the Kapāpala Section of the Ka‘ū Forest Reserve, and it is surrounded by other State-owned lands including other sections of the Ka‘ū Forest Reserve to the southwest, the Kapāpala Forest Reserve to the northwest, and public lands under general lease and revocable permits to Kapāpala Ranch to the northeast and southeast (Figure 4). Portions of Kapāpala Ranch are also a cooperative game management area. The project area is located roughly 3.2-miles *mauka* (west) of Māmalahoa Highway (also known as Highway 11 or Hawai‘i Belt Road), 11 miles east of Moku‘āweoweo Crater, and 11 miles west of Halema‘uma‘u. Access to the KKCMA is through Kapāpala Ranch. At the southeastern boundary of the project area is a gate (Figure 5) that leads into the KKCMA. An unpaved road and cattle fencing extends along the entire perimeter of the project area (Figures 6, 7, 8, and 9). The central portion of the project area parcel is also bisected by an unpaved road (oriented roughly north-south) shown below in Figure 10.

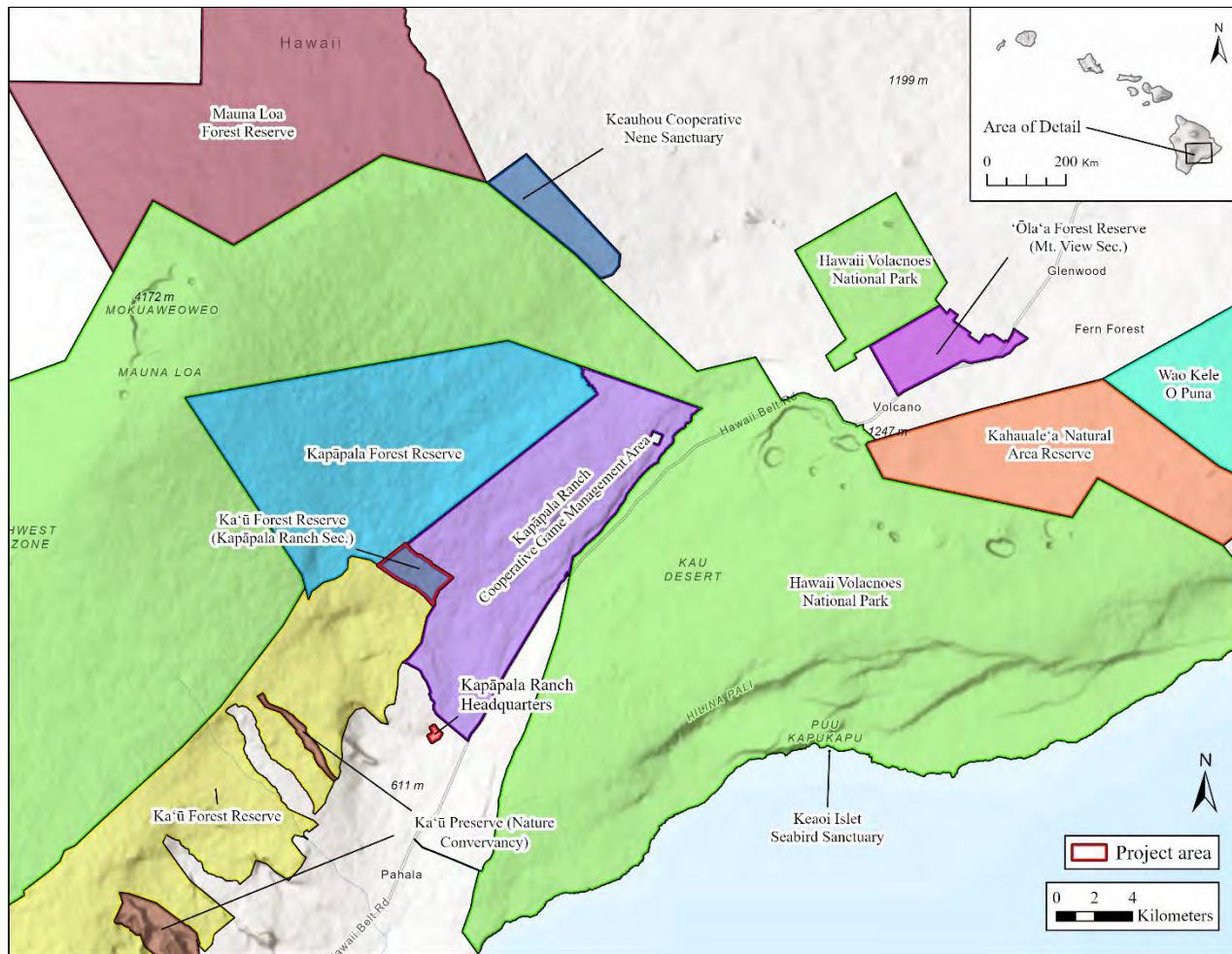


Figure 4. Map showing various forest reserves around the project area.



Figure 5. Entrance into the KKCMA, view to the west.



Figure 6. Access road and cattle fencing along the eastern boundary of the KKCMA, view to the northeast.



Figure 7. Northeastern corner of the KKCMA with Kapāpala Ranch in the background beyond the fence, view to the northeast.



Figure 8. View of access road and forest along the northwestern corner of KKCMA, view to the southwest.



Figure 9. View of access road and forest along the southwest corner of the KKCMA, view to the east.



Figure 10. Access road extending north-south across the KKCMA, view to the north.

At this elevation, the annual precipitation rate is about 83 inches and fluctuates seasonally. During *ho‘oilo* (the wet season) between October and March, the project area received anywhere between 5 to 9 inches monthly and can drop as low as 3 inches during *kau* (dry season) lasting between April through September (Giambelluca et al. 2013). The air temperature in the project area is relatively cool and dips as low as 56° Fahrenheit during *ho‘oilo* and increases slightly to about 62° Fahrenheit during *kau* (Giambelluca et al. 2014). The geology underlying the KKCMA is comprised entirely of *pāhoehoe* flows originating from Mauna Loa between 750-1,500 years ago and mapped in Figure 11 as “Qk3.” Three soil types have been mapped in the project area with the most dominant being Kaholimo medial silt loam with a 10 to 20 percent slope which is mapped in Figure 12 as “573.” Two less dominant soil types are also present including another Kaholimo medial silt loam with a 3 to 10 percent slope found along the northeastern boundary and labeled in Figure 12 as “617” and Alapai hydrous silty clay loam with a 10 to 20 percent slope mapped in Figure 12 as “517” and found along the southeast corner of the project area.

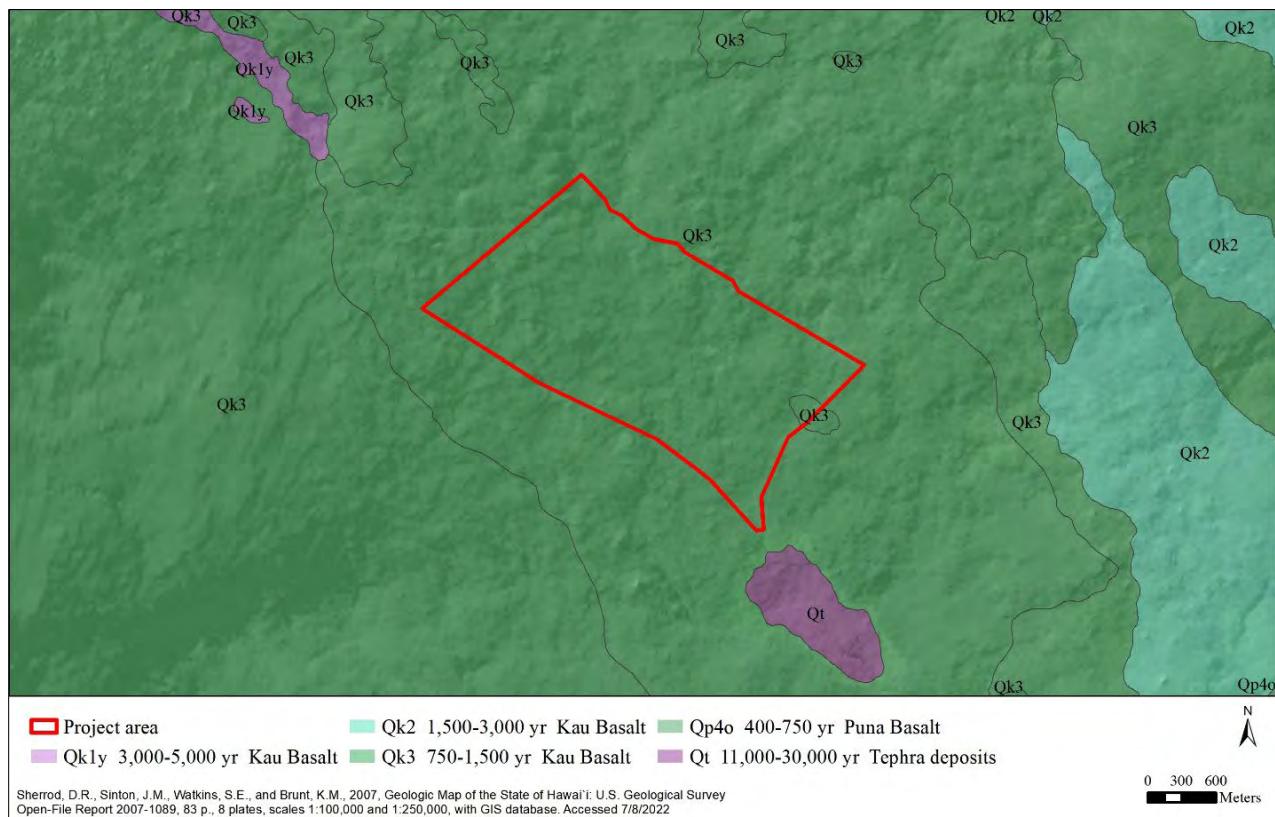


Figure 11. Geology underlying the project area.

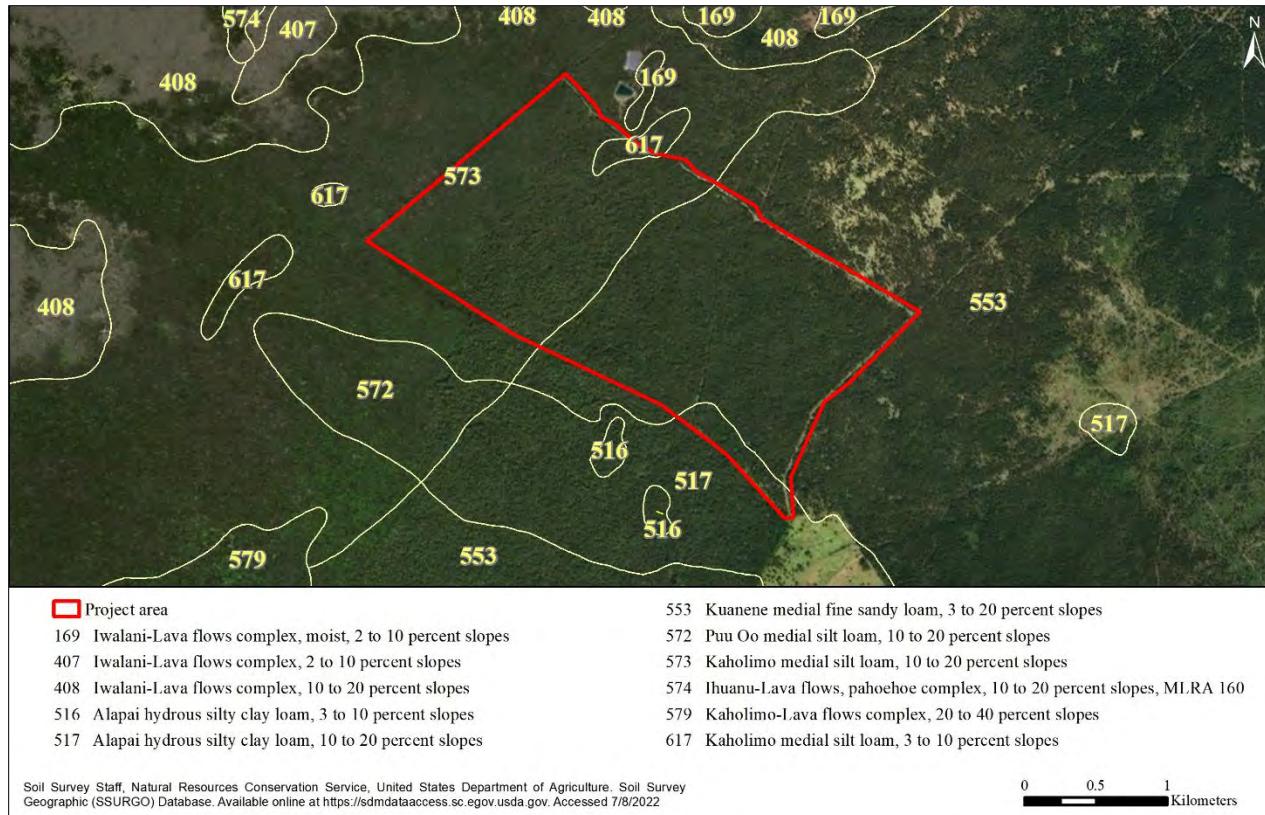


Figure 12. Soils in the project area.

Vegetation and Gulches

The vegetation within the KKCMA is dominated by mesic montane native *koa*-‘ōhi‘a forest. Recent field observations and data collected during forest inventories have divided the vegetation in the project area into four strata (Figure 13), which is largely based on vegetation cover. At the lowest elevation is K01 described as an open ‘ōhi‘a Forest inclusive of 324 acres (Figure 14). Situated *mauka* of K01 is K02, an open Koa-‘ōhi‘a Forest inclusive of 386 acres (Figure 15). *Mauka* of K02 is K03 described as a closed Koa-‘ōhi‘a Forest comprising some 323 acres (Figure 16). At the *mauka*-most end of the project area is K04, described as a mature Koa Forest containing 207 acres (Figure 17). There are at least four gulches of various sizes that extend through the project area, two of which are named. Po‘opipi Gulch extends along the northeastern portion of the project area and Honanui Gulch along the southwestern portion of the project area.

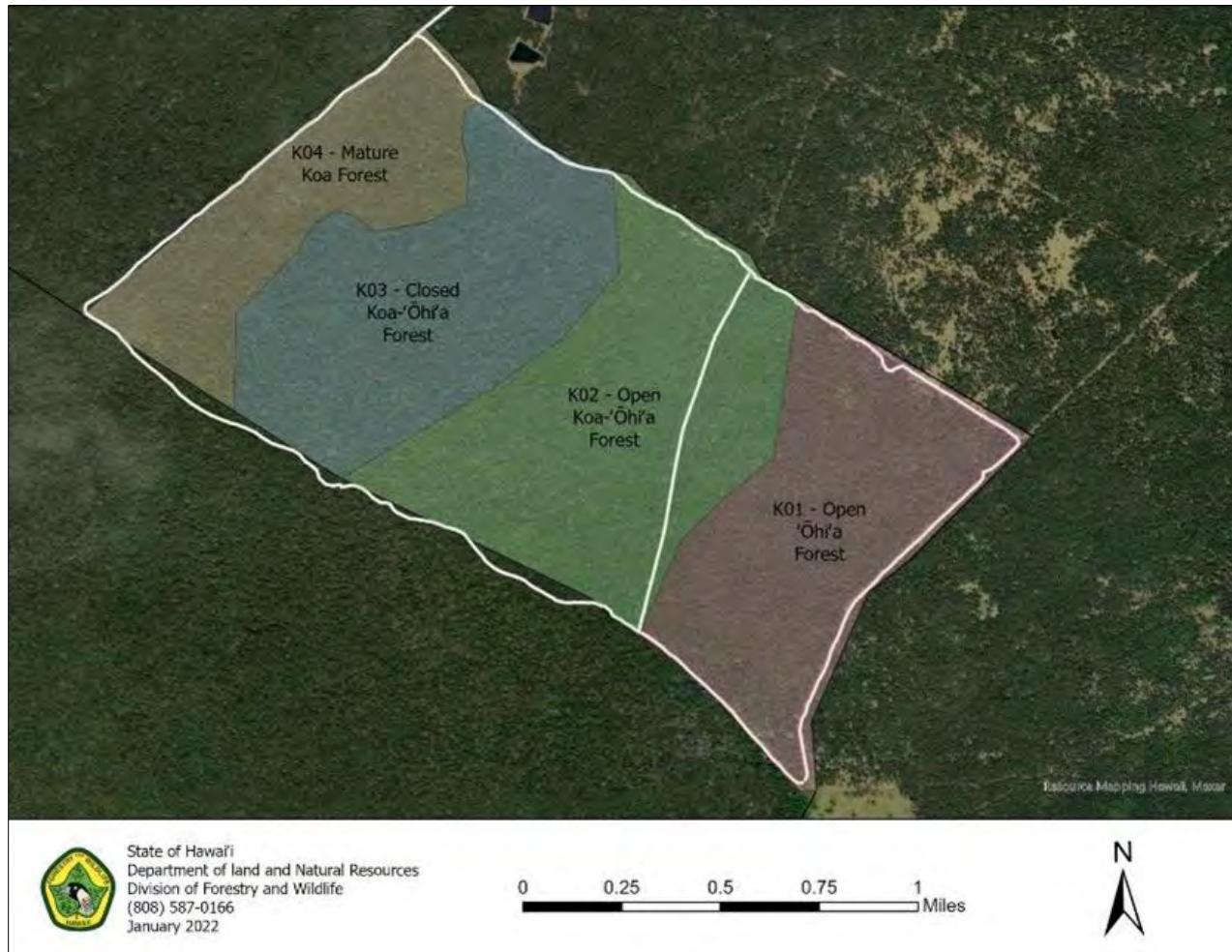


Figure 13. Forest strata in the KKCMA.



Figure 14. View of forest within the northern portion of KO1, view to the southeast.

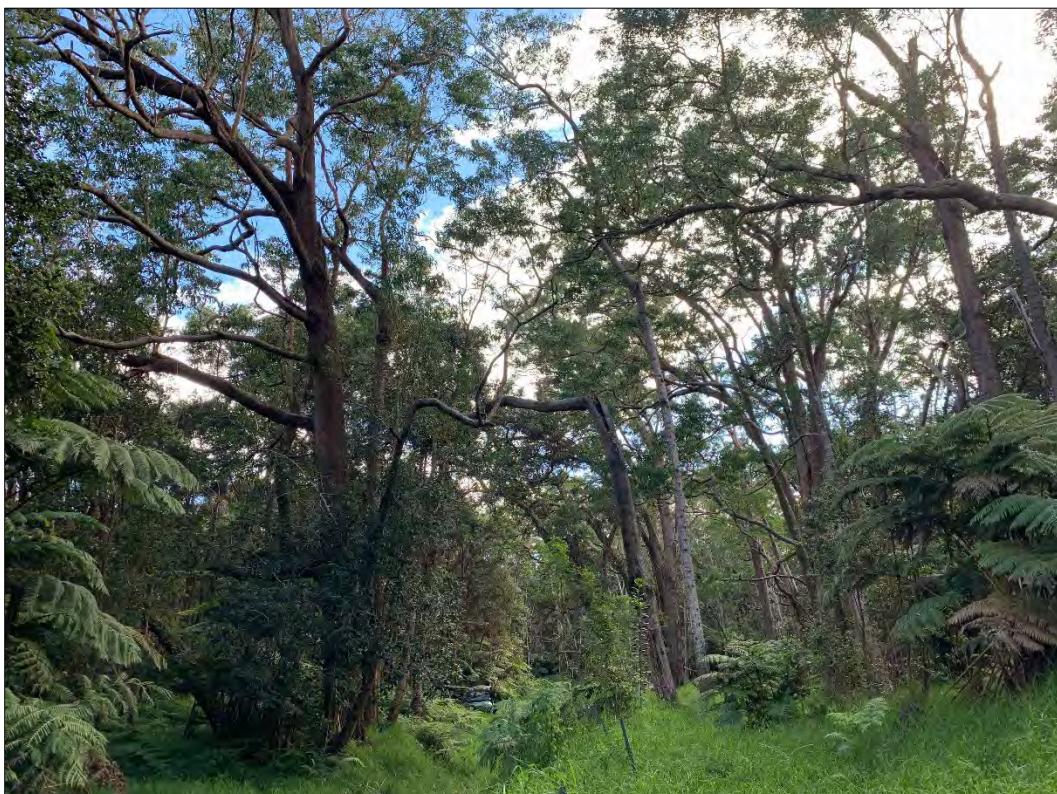


Figure 15. View of forest within K02 along the central (north-south) access road, view to the south.



Figure 16. View of forest along the northern portion of K03, view to the northwest.



Figure 17. View of forest in K04, view to the southeast.

2. BACKGROUND

As specified in the OEQC *Guidelines for Assessing Cultural Impacts* (1997:1), "...the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment." For this CIA, the *ahupua'a* of Kapāpala is considered the 'study area', while the location of the KKCMA is referred to as the 'project area.' Limited background information for Ka'ū, the broader regional designation in which Kapāpala is situated, also falls within the parameters of the OEQC guidelines and ensures that a broader set of cultural practices and histories are considered. Since the scope of this project focuses on the sustainable harvesting of *koa* that will be fashioned into canoes used customarily for fishing, outrigger canoe racing, and voyaging, the background section also includes a synthesis of historical accounts written by David Malo, Abraham Fornander, Tommy Holmes, Edgar Henriques, and Kalokuokamaile—all of whom wrote extensively about the customs and beliefs of traditional *koa* harvesting and canoe making.

To generate a set of expectations regarding the nature of cultural resources and customary practices that might be encountered within the project area and to establish a context within which to assess the significance of such resources, this background section begins with a general culture-historical context. This culture-historical context includes a discussion about the theories and beliefs associated with the settlement of the islands, an overview of traditional land management strategies, and a discussion on the intensification and development of Hawaiian land stewardship practices. This section is followed by a synthesis of historical accounts that speak directly to the customs and beliefs associated with traditional *koa* harvesting and canoe making. This background section includes a chronological summary of background information concerning the history of Kapāpala. Lastly, this section concludes with a summary of relevant prior archaeological and cultural studies that have been conducted within and in the immediate vicinity of the project area.

RESEARCH METHODS

The culture-historical context and summary of previously conducted archaeological and cultural research presented below are based on original research conducted by ASM Affiliates at various physical and digital repositories. Primary English language and Hawaiian language resources were found at multiple state agencies, including the Bishop Museum, State Historic Preservation Division, Hawai'i State Archives, and the Department of Accounting and General Services Land Survey Division. Digital collections provided by the Office of Hawaiian Affairs Papakilo and Kīpuka databases, the Ulukau Hawaiian Electronic Library, and Newspapers.com. Lastly, secondary resources curated at ASM Affiliates' Hilo office offer general information regarding the history of land use, politics, and culture change in Hawai'i, enhancing the broad sampling of source materials cited throughout this CIA.

CULTURE-HISTORICAL CONTEXT

While the question of when Hawai'i was first settled by Polynesians remains contested, scholars working in the fields of archaeology, folklore, Hawaiian studies, and linguistics have offered several theories. With advances in palynology and radiocarbon dating techniques, Kirch (2011), Athens et al. (2014), and Wilmshurst et al. (2011) have argued that Polynesians arrived in the Hawaiian Islands sometime between A.D. 1000 and A.D. 1200. This initial migration on intricately crafted *wa'a kaulua* (double-hulled canoes) to Hawai'i from Kahiki, the ancestral homelands of Hawaiian deities and peoples from southern Pacific islands, occurred at least from initial settlement to the 13th century. According to Fornander (1969), Hawaiians brought from their homeland certain Polynesian customs and beliefs: the major gods Kāne, Kū, Lono, and Kanaloa (who have cognates in other Pacific cultures); the *kapu* system of political and religious governance; and the concepts of *pu'uhonua* (places of refuge), 'aumakua (ancestral deity), and *mana* (divine power). Archaeologist Kenneth Emory who worked in the early to mid-20th century reported that the sources of early Hawaiian populations originated from the southern Marquesas Islands (Emory in Tatar 1982). However, Emory's theory is not universally accepted, as Hawaiian scholars in the past and present have argued for a pluralistic outlook on ancestral Hawaiian origins from Kahiki (Case 2015; Fornander 1916-1917; Kamakau 1866; Kikiloi 2010; Nakaa 1893; Poepoe 1906).

While stories of episodic migrations were widely published in the Hawaiian language by knowledgeable and skilled *kū'auhau* (individuals trained in the discipline of remembering genealogies and associated ancestral stories), the cultural belief that living organisms were *hānau 'ia* (born) out of a time of eternal darkness (*pō*) and chaos (*kahuli*) were brought and adapted by ancestral Hawaiian populations to reflect their deep connection to their environment. As an example, the *Kumulipo*, Hawai'i's most famed *ko'i'honua* (a cosmogonic genealogical chant), establishes a birth-rank genealogical order for all living beings (Beckwith 1951; Liliuokalani 1978). One such genealogical relationship that remains widely

accepted in Hawai‘i is the belief that *kalo* (taro) plants (in addition to all other plants, land animals, and sea creatures), are elder siblings to humans (Beckwith 1951). This concept of hierarchical creation enforces the belief that all life forms are intimately connected, evidencing the cultural transformations that occurred in the islands through intensive interaction with their local environment to form a uniquely Hawaiian culture.

In Hawai‘i’s ancient past, inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy et al. 1991). Following the initial settlement period, communities clustered in the *ko’olau* (windward) shores of the Hawaiian Islands where freshwater was abundant. Sheltered bays allowed for nearshore fisheries (enriched by numerous estuaries) and deep-sea fisheries to be easily accessed (McEldowney 1979). Widespread environmental modification of the land also occurred as early Hawaiian *kandaka mahi’ai* (farmers) developed new subsistence strategies, adapting their familiar patterns and traditional tools to work efficiently in their new home (Kirch 1985; Pogue 1978). Areas with the richest natural resources became heavily populated over time, resulting in the population’s expansion to the *kona* (leeward) side of the islands and to more remote areas (Cordy 2000).

Overview of Traditional Hawaiian Land Management Strategies

Adding to an already complex society was the development of traditional land stewardship systems, including the *ahupua’ā*. The *ahupua’ā* was the principal land division that functioned for taxation purposes and furnished its residents with nearly all subsistence and household necessities. *Ahupua’ā* are land divisions that typically include multiple ecozones from *mauka* (upland mountainous regions) to *makai* (shore and near-shore regions), assuring a diverse subsistence resource base (Hommon 1986). Although the *ahupua’ā* land division typically incorporated all of the eco-zones, their size and shape varied greatly (Cannelora 1974). Noted Hawaiian historian and scholar Samuel Kamakau summarized the ecozones that could be found in a given *ahupua’ā*:

Here are some names for [the zones of] the mountains—the *mauna* or *kuahiwi*. A mountain is called a *kuahiwi*, but *mauna* is the overall term for the whole mountain, and there are many names applied to one, according to its delineations (‘ano). The part directly in back and in front of the summit proper is called the *kuamauna*, mountaintop; below the *kuamauna* is the *kuahaea*, and makai of the *kuahaea* is the *kuahiwi* proper. This is where small trees begin to grow; it is the *wao nahele*. Makai of this region the trees are tall, and this is the *wao lipo*. Makai of the *wao lipo* is the *wao ‘eiwa*, and makai of that the *wao ma’ukele*. Makai of the *wao ma’ukele* is the *wao akua*, and makai of there is the *wao kanaka*, the area that people cultivate. Makai of the *wao kanaka* is the ‘ama’u, fern belt, and makai of the ‘ama’u the ‘apa’ā, grasslands.

A solitary group of trees is a *moku la’au* (a “stand” of trees) or an *ulu la’au*, grove. Thickets that extend to the *kuahiwi* are *ulunahele*, wild growth. An area where *koa* trees suitable for canoes (*koa wa’ā*) grow is a *wao koa* and *mauka* of there is a *wao la’au*, timber land. These are dry forest growths from the ‘apa’ā up to the *kuahiwi*. The places that are “spongy” (*naele*) are found in the *wao ma’ukele*, the wet forest.

Makai of the ‘apa’ā are the *pahe’e* [pili grass] and *‘ilima* growths and makai of them the *kula*, open country, and the ‘apoho hollows near to the habitations of men. Then comes the *kahakai*, coast, the *kahaone*, sandy beach, and the *kalawa*, the curve of the seashore—right down to the ‘ae kai, the water’s edge.

That is the way *ka po’e kahiko* [the ancient people] named the land from mountain peak to sea. (Kamakau 1976:8-9)

The *maka’āinana* (commoners, literally the “people that attend the land”) who lived on the land had rights to gather resources for subsistence and tribute within their *ahupua’ā* (Jokiel et al. 2011). As part of these rights, residents were required to supply resources and labor to *ali’i* (chiefs) of local, regional, and island chiefdoms. The *ahupua’ā* became the equivalent of a local community with its own social, economic, and political significance and served as the taxable land division during the annual *Makahiki* procession (Kelly 1956). During the time of *Makahiki*, the paramount *ali’i* sent select members of his/her retinue to collect *ho’okupu* (tribute and offerings) in the form of goods from each *ahupua’ā*. The *maka’āinana* brought their share of *ho’okupu* to an *ahu* (altar) that was marked with the image of a *pua’ā* (pig), serving as a physical marker of *ahupua’ā* boundaries. In most instances, these boundaries followed mountain ridges, hills, rivers, or ravines (Alexander 1890). However, Chinen (1958:1) reports that “oftentimes only a line of growth of a certain type of tree or grass marked a boundary; and sometimes only a stone determined the corner of a division.” These ephemeral markers, as well as their more permanent counterparts, were oftentimes named as evidenced in the thousands of boundary marker names that are listed in Soehren (Soehren 2005b).

2. Background

Ahupua'a were ruled by *ali'i 'ai ahupua'a* or chiefs who controlled the *ahupua'a* resources. Generally speaking, *ali'i 'ai ahupua'a* had complete autonomy over the *ahupua'a* they oversaw (Malo 1951). *Ahupua'a* residents were not bound to the land nor were they considered property of the *ali'i*. If the living conditions under a particular *ahupua'a* chief were deemed unsuitable, the residents could move freely in pursuit of more favorable living conditions (Lam 1985). This structure safeguarded the well-being of the people and the overall productivity of the land, lest the chief loses the principal support and loyalty of his or her supporters. In turn, *ahupua'a* lands were managed by an appointed *konohiki*, oftentimes a chief of lower rank, who oversaw and coordinated stewardship of an area's natural resources (Lam 1985). In some places, the *po'o lawai'a* (head fisherman) held the same responsibilities as the *konohiki* (Jokiel et al. 2011). When necessary, the *konohiki* took the liberty of implementing *kapu* (restrictions and prohibitions) to protect the *mana* of an area's resources from environmental and spiritual depletion.

Many *ahupua'a* were divided into smaller land units termed '*ili*' and '*ili kūpono*' (often shortened to '*ili kū*'). '*Ili*' were created for the convenience of the *ahupua'a* chief and served as the basic land unit which *hoa'āina* (caretakers of particular lands) often retained for multiple generations (Jokiel et al. 2011; MacKenzie 2015). As '*ili*' were typically passed down in families, so too were the *kuleana* (responsibilities, privileges) that were associated with it. The right to use and cultivate '*ili*' was maintained within the '*ohana*', regardless of the succession of *ali'i 'ai ahupua'a* (Handy et al. 1991). Malo (1951) recorded several types of '*ili*', including the '*ili pa'a*' (a single intact parcel) and '*ili lele*' (a discontinuous parcel dispersed across an area). Whether dispersed or wholly intact, '*ili*' required a cross-section of available resources, and for the *hoa'āina*, this generally included access to agriculturally fertile lands and coastal fisheries. '*Ili kūpono*' differed from other '*ili*' lands because they did not fall under the jurisdiction of the *ahupua'a* chief. Rather, they were specific areas containing resources that were highly valued by the ruling paramount chiefs, such as fishponds (Handy et al. 1991).

Ali'i 'ai ahupua'a, in turn, answered to an *ali'i 'ai moku* (chief who claimed the abundance of the entire *moku* or district) (Malo 1951). Hawai'i Island is comprised of six *moku* (districts) that include Kona, Ka'ū, Puna, Hilo, Hāmākua, and Kohala. Although a *moku* comprises multiple *ahupua'a*, *moku* were considered geographical subdivisions with no explicit reference to rights in the land (Cannelora 1974). While the *ahupua'a* was the most common and fundamental land division unit within the traditional Hawaiian land management structure, variances occurred, such as the existence of the *kalana*. By definition, a *kalana* is a division of land that is smaller than a *moku*. *Kalana* was sometimes used interchangeably with the term '*okana*' (Lucas 1995; Pukui and Elbert 1986), but Kamakau (Kamakau 1976) equates a *kalana* to a *moku* and states that '*okana*' is merely a subdistrict. Despite these contending and sometimes conflicting definitions, what is clear is that *kalana* consisted of several *ahupua'a* and '*ili 'āina*'.

This form of district subdividing was integral to Hawaiian life and the product of advanced natural resource management systems. As populations resided in an area over centuries, direct teaching and extensive observations of an area's natural cycles and resources were retained, well-understood, and passed down orally over the generations. This knowledge informed management decisions that aimed to sustainably adapt subsistence practices to meet the needs of growing populations. The *ahupua'a* system and the highly complex land management system that developed in the islands are but one example of the unique Hawaiian culture that developed in these islands.

Intensification and Development of Hawaiian Land Stewardship Practices

Hawaiian philosophies of life in relation to the environment helped to maintain both natural, spiritual, and social order. In describing the intimate relationship that exists between Hawaiians and '*āina* (land), Kepā Maly writes:

In the Hawaiian context, these values—the “sense of place”—have developed over hundreds of generations of evolving “cultural attachment” to the natural, physical, and spiritual environments. In any culturally sensitive discussion on land use in Hawai'i, one must understand that Hawaiian culture evolved in close partnership with its’ natural environment. Thus, Hawaiian culture does not have a clear dividing line of where culture and nature begins.

In a traditional Hawaiian context, nature and culture are one in the same, there is no division between the two. The wealth and limitations of the land and ocean resources gave birth to, and shaped the Hawaiian world view. The '*āina* (land), *wai* (water), *kai* (ocean), and *lewa* (sky) were the foundation of life and the source of the spiritual relationship between people and their environs. (Maly 2001)

The '*ōlelo no'eau* (proverbial saying) “*hānau ka 'āina, hānau ke ali'i, hānau ke kanaka*” (born was the land, born were the chiefs, born were the commoners), conveys the belief that all things of the land, including *kanaka* (humans), are connected through kinship links that extend beyond the immediate family (Pukui 1983:57). '*Āina* or land, was perhaps most revered, as noted in the '*ōlelo no'eau* “*he ali'i ka 'āina; he kauwā ke kanaka*,” which Pukui (Pukui 1983:62) translated as “[t]he land is a chief; man is its servant.” The lifeways of early Hawaiians, which were dependent

entirely from the finite natural resources of these islands, necessitated the development of sustainable resource management practices. Over time, what developed was an ecologically responsive management system that integrated the care of watersheds, natural freshwater systems, and nearshore fisheries (Jokiel et al. 2011).

Disciplined and astute observation of the natural world became one of the most fundamental stewardship tools used by the ancient Hawaiians. The vast knowledge acquired through direct observation enabled them to detect and record the subtlest of changes, distinctions, and correlations in the natural world. Examples of their keen observations are evident in the development of Hawaiian nomenclature to describe various rains, clouds, winds, stones, environments, flora, and fauna. Many of these names are geographically unique or island-specific, and have been recorded in *oli* (chants), *mele* (songs), *pule* (prayers), *inoā āina* (place names), and *‘ōlelo no ‘eau* (proverbial sayings). Other Hawaiian arts and practices such as *hula* (traditional dance), *lapa ‘au* (traditional healing), *lawai ‘a* (fishing), *mahi ‘ai* (farming) further aided in the practice of knowing the rhythms and cycles of the natural world.

Comprehensive systems of observing and stewarding the land were coupled by the strict adherence to practices that maintained and enhanced the *kapu* and *mana* of all things in the Hawaiian world. In Hawaiian belief, all things natural, places, and even people, especially those of high rank, possessed *mana* or “divine power” (Pukui and Elbert 1986:235; Pukui et al. 1972). *Mana* was believed to be derived from the plethora of Hawaiian gods (*kini akua*) who were embodied in elemental forces, land, natural resources, and certain material objects and persons (Crabbe et al. 2017). Buck (1993) expanded on this concept noting that *mana* was associated with “the well-being of a community, in human knowledge and skills (canoe building, harvesting) and in nature (crop fertility, weather etc.)” (c.f. Else 2004:244).

To ensure the *mana* of certain resources, places, and people, *kapu* of various kinds were implemented and strictly enforced to limit over-exploitation and defilement. Elbert and Pukui (1986:132) defined *kapu* as “taboo, prohibitions; special privilege or exemption.” Kepelino noted that *kapu* associated with *akua* (deities) applied to all social classes, while *kapu* associated with *ali‘i* were applied to the people (in Beckwith 1932). As *kapu* dictated social relationships, they also provided “environmental rules and controls that were essential for a subsistence economy” (Else 2004:246). The companion to *kapu* was *noa*, translated as “freed of taboo, released from restrictions, profane, freedom” (Pukui and Elbert 1986:268). Some *kapu*, particularly those associated with maintaining social hierarchy and gender differentiation were unremitting, while those *kapu* placed on natural resources were applied and enforced according to seasonal changes. The application of *kapu* to natural resources ensured that such resources remained available for future use. When the *ali‘i* or the lesser chiefs (including *konohiki* and *po‘o lawai ‘a*) determined that a particular resource was to be made available to the people, a decree was proclaimed indicating that *kapu* had been lifted, thereby making it *noa*. Although transitioning a resource from a state of *kapu* to *noa* allowed for its use, people were expected to practice sustainable harvesting methods and pay tribute to the paramount chief and the *akua* associated with that resource. *Kapu* were strictly enforced and violators faced serious consequences including death (Jokiel et al. 2011). Violators who escaped execution sought refuge at a *pu‘uhonua*, a designated place of refuge, or an individual who could pardon the accused (Kamakau 1992). After completing the proper rituals, the violator was absolved of his or her crime and allowed to reintegrate back into society.

In summary, the layering and interweaving of beliefs, land stewardship practices, and the socio-political system forms the basis of the relationship shared between the Hawaiian people and the land. It is through the analysis of these dynamic elements that we develop an understanding of the complexity of place.

PRACTICES AND CUSTOMS OF TRADITIONAL HAWAIIAN CANOE MAKING

The Hawaiian term *wa‘a* is a Proto-Polynesian cognate derived from the term *waka* or *vaka* and it has been posited by archaeologist and linguistic scholars that this term and few others have remained largely unchanged “because of their fundamental importance in each society” (Hommon 2013:142-143; Pukui and Elbert 1986). While the term *wa‘a* is most commonly used to refer to a canoe, other definitions include “trench, furrow, receptacle” and was sometimes used figuratively to refer to a woman and at times, “moving masses of liquid lava” because of its similarity to a moving canoe (Pukui and Elbert 1986:375). Canoes appear in many of Hawai‘i’s earliest migration stories (Fornander 1878, 1880, 1916-1917, 1918-1919). The canoes that were used by the early Polynesians to migrate across vast oceans from their ancestral homeland in Kahiki to Hawai‘i were typically double-hulled plank-lashed canoes (Chun and Burningham 1995). As the main transporter of peoples and deities from one island to the next, the significance of the canoe is deeply rooted in the origins of the Hawaiian people and Hawaiian canoe traditions and customs persists today as a critical piece of a living culture.

Upon their arrival in Hawai‘i, early Polynesian voyagers continued to construct and utilize canoes (Figure 18) for fishing, travel, warfare, and play (Chun and Burningham 1995; Fornander 1878). However, their new environment provided a host of endemic hardwood plant species from which they would soon adapt their canoe-making traditions.

2. Background

Koa (*Acacia koa*), the second most prolific tree in the Hawaiian forest—after ‘ōhi‘a (*Metrosideros polymorpha*)—became the choice species for canoes (Holmes 1981). Although *koa* was the principle wood used in canoe-making Malo (1898:168) notes that “from the earliest times the wood of the bread-fruit, *kukui*, *ohia-ha*, and *wiliwili* was used in canoe making...” Known for its range of characteristics and form, botanists generally agree that there are three subgroups of *koa* found throughout Hawai‘i, *Acacia koa*, *A. kauaiensis*, and *A. Koaiā* (*koai‘e*) (Baker et al. 2009; Wagner et al. 1999). Of the three subgroups, *A. koa* (referred to hereafter as *koa*) known for its extraordinary height, circumference, and remarkable durability, was the species relied upon by the ancient Hawaiians for canoe building. The transition from plank-lashed canoes to hollowed out *koa* logs marked an important shift in Polynesian canoe building traditions (Holmes 1981).

Despite its wide spread distribution, not every *koa* tree was suitable for canoe making. According to South Kona Native, Z.P. K. Kawaikaumaiikamakaokaopua (1922) (also known as and referred to hereafter as Kalokuokamaile), the master canoe carvers, known as *kahuna kālaiwa‘a* or *kālaiwa‘a*, was considered the foremost of all traditional occupational trades. The master carver had to possess a wide range of highly specialized technical knowledge. The *kālaiwa‘a* paid close attention to the wood grain and developed a pragmatic classification system in which different wood grains were named based on their attributes. Low-density *koa* (roughly 30-40 pounds per cubic foot), which was most suitable for paddles but sometimes used for canoes, was known as *koa lā‘au mai‘a* (banana-colored *koa*) and was characterized by its soft, lightweight, and yellow color. This type of *koa* was also known as *koa ‘awapuhi* (ginger *koa*) but was considered female. The favored wood grain for canoes was the mid-range density *koa* (40-60 pounds per cubic foot), which was valued for both its durability and strength. High-density *koa* (60-80 pounds per cubic foot) known as *koa ‘i‘o ‘ōhi‘a* (*‘ōhi‘a* grain *koa*) was less ideal for canoe building as the wood was exceptionally dense which made carving very difficult (Holmes 1981).



Figure 18. Mr. A. Lister and Kaiopua with a *koa* canoe at Kealakekua, Kona, Hawai‘i. Photo courtesy of K. P. Emory, Bishop Museum Archives (SN 10480).

According to Holmes (1981), to identify the grain quality, the *kālaiwa‘a* scrutinized the tree’s observable traits including its bark, trunk shape and dimensions, and branching patterns. The whitish bark found on the *lau mai‘a* variety was named *kaekae*, which has been translated by (Pukui and Elbert 1986:109) as “smooth, polished, perfect, as a new canoe without knots or knobs.” In contrast, the tough dark red bark found on the *i‘o ‘ōhi‘a* variety was known as *mauā* meaning “stiff” or “shoots from fallen trunks” (Pukui and Elbert 1986:241). Holmes (1981) provided the following terminology (Table 1) used in identifying *koa* suitable for canoes.

Table 1. Hawaiian *koa* terminology from Holmes (1981:21).

Hawaiian Term	Definition
<i>koa hi‘u wa‘a</i>	growing straight up before branching; also <i>koa hi‘u awa</i> .
<i>koa huhui</i>	growing straight up, with a cluster of branches at the top.
<i>koa huli pū</i>	having wood of such good quality throughout that it was thought best to avoid cracking the log by exposing and drying out the roots, letting the tree fall over, rather than cutting it down.
<i>koa iho ‘ole</i>	crooked but nicely bent in an arc; could be easily shaped to give the hull a “banana” curve; considered the most desirable type.
<i>koa kamahele</i>	having one branch larger and more serviceable than the trunk itself; also <i>koa lālā kamahele</i> .
<i>koa kolo</i>	leaning or sprawling, but still fit for use.
<i>koa kolopū</i>	growing straight up with no significant branching; of uniform diameter nearly the whole length of the trunk; waves will wash into a canoe made from this type.
<i>koa kū ke‘ele wa‘a</i>	straight but somewhat flattened on both sides.
<i>koa kūpalaha</i>	having a broad, straight trunk, but rather flat on one side.
<i>koa kūpalina</i>	generally usable but imperfect; bent, flattened, short, not well-proportioned.
<i>koa kupulā‘iki</i>	same as <i>koa kūpalaha</i> .
<i>koa lālā kamahele</i>	same as <i>koa kamahele</i> .
<i>koa lau kane</i>	(no data)
<i>koa lau kani</i>	strong; considered male; possibly same as <i>koa lau kane</i> .
<i>koa lau nui</i>	a large-leaved variety.
<i>koa no‘u</i>	straight, thick, unblemished, not very tall; suitable for a wide, short canoe such as an ‘ōpelu (heavy duty fishing canoe).
<i>koa poepoe</i>	of good size but short and thick.

Today, *koa* is found across all the main Hawaiian Islands except Ni‘ihau and Kaho‘olawe, with the largest populations found on Hawai‘i Island between the 3,000 to the 6,500-foot elevation where they dominate the native lower montane forest (Baker et al. 2009). Its present-day distribution has been, however, severely disrupted by historical industries such as ranching, logging, land clearing, and wild fire (Holmes 1981).

Several Hawai‘i based historians and scholars have written extensively on the various steps involved in transforming a *koa* tree into the hull of a canoe. Let it be known that while the ‘ike (information) provided may not be specific to the Kapāpala area, the ‘ike is specific to practices of Hawai‘i Island and of the South Kona region. It is presumed by the cohesiveness of these accounts and the geographical closeness of Ka‘ū to South Kona, that the processes utilized by the *kālaiwa‘a* of Kapāpala were likely very similar to the accounts recorded by David Malo, Abraham Fornander, Tommy Holmes, Edgar Henriques, and Kalokuokamaile.

Malo (1903) was a North Kona descendant, famed as a chiefly counselor, Hawaiian historian, scholar, and minister who was born around the time of Vancouver’s second voyage to Hawai‘i. He was integral in recording the history of old Hawai‘i and much of what we know today comes from his contributions. Fornander arrived in the islands around 1838 and married Moloka‘i Chiefess Pinao Alanakapu. He was a judge who, through his writings helped to preserve a lot of Hawai‘i’s traditions and culture (Advertiser 1887). Holmes was an accomplished writer, publisher, and founder of the Polynesian Voyaging Society who specialized in marine and maritime ethnohistory of Hawai‘i and the Pacific Islands (Froiseth and Froiseth 1993; Holmes 1981). Henriques was the recording secretary of the Hawaiian Historical Society in 1926. In 1912 he accompanied *kahuna kālaiwa‘a* Kealakahī and witnessed firsthand, the *wa‘a* ceremonies that took place in Ki‘ilae, South Kona (Henriques 1926) Kalokuokamaile was a South Kona descendent of canoe makers whose father was an expert in this work. He continued to build canoes traditionally during the early 1900s (Holmes 1981).

Beginning Rituals of the Kahuna Kālaiwa‘a

“The building of a canoe was an affair of religion” (Malo 1903:168) Much of Hawai‘i’s traditional practices were religious in nature as they dealt with *kanaka* entering spaces that required certain rituals and protocols to appease the myriad of Hawaiian gods. Due to the dangerous nature of constructing canoes, *kahuna kālaiwa‘a* adhered to a variety of canoe gods in every step of the *kālaiwa‘a* process. One of the first steps in becoming a *kahuna* is choosing your primary god. Kalokuokamaile (1922) names Lea, Mokuhāli‘i, and Kūpā‘aikē‘e as the three primary canoe-carving gods. In addition to these three, countless other gods are called upon during different stages of the process. Table 2 is taken from Tommy Holmes’ (1981:31) and is supplemented with additional gods mentioned by Malo, Kalokuokamaile, and Elbert and Pukui (1971).

Table 2. Akua associated with canoe making (*akua mentioned by Malo and Kalokuokamaile)

Name	Description
<i>Hina-ke-kā</i>	Goddess of canoe bailers.
<i>Hina-kū-wa‘a</i>	Another name for Lea.
<i>Hina-puku-‘ai</i>	Goddess of food plants; sister of Lea; took the form of an ‘elepaio. Elbert and Pukui (1971:384) add that if she [in the form of an ‘elepaio] “pecked a tree, canoe makers knew that it was insect ridden and not suitable for a canoe. The spot where she landed on a felled tree was to be the prow; she then ran toward the stern.”
<i>Ka-pū-‘ā-o-alaka‘i</i>	Another name for Ka-pū-o-alaka‘i.
<i>Ka-pū-o-alaka‘i</i>	Forest goddess; presided over the lines by which new canoes were guided as they were transported from mountains to sea; also Ka-pū-‘ā-o-alaka‘i.
<i>Kama-i-ka-huli-wa‘a-pū</i>	God who aided in floating, righting, and bailing out upset canoes.
<i>Kānealuka</i>	God of canoe builders.
<i>Kū-‘ālana-wao</i>	Kū of the upland offering. Elbert and Pukui (1971:389) add that he was “a god of the forest (<i>wao</i>) and of canoe makers.
<i>Kū-holoholo-pali</i>	Kū who steadies the canoe as it is carried down steep places.
<i>Kū-kalanawao</i>	Kū who guides throughout the mountain wilderness.
<i>Kū-kanaloa</i>	(no data)
<i>Kū-ka-‘ōhi‘a-laka</i>	Kū of the sacred ‘ōhi‘a; also Laka.
<i>Kū-maha-ali‘i</i>	Kū who journeys in the canoe.
<i>Kū-mauna</i>	Kū of the mountains.
<i>Kū-moku-hāli‘i</i>	Kū who bedecks the island; canoe builder’s chief god; husband of Lea; also Mokuhāli‘i.
<i>Kū-‘ōhi‘a-Laka</i>	Another name for Laka.
<i>Kū-olonawao</i>	Kū of the deep forest.
<i>Kū-pepeiao-loa</i>	Kū of the long comb-cleats; god of the seat braces by which the canoe is carried.
<i>Kū-pepeiao-poko</i>	Kū of the short comb-cleats; god of the seat braces by which the canoe is carried.
<i>Kū-pulapula</i>	Kū with many offspring.
<i>Kū-pulupulu</i>	Kū the chip-maker; god of the forest; also Kū-pulupulu-i-ka-nahele, Kulauka.
<i>Kulauka</i>	Another name for Kū-pulupulu.
<i>Laka</i>	God of canoe builders; also Kū-‘ōhi‘a-laka.
<i>Lea</i>	Goddess of canoe builders; wife of Kū-moku-hāli‘i; sister of Hina-puku-‘ai; took form of an ‘elepaio; also Hina-kū-wa‘a, Laea, Lea-ka-wahine.
<i>Lea-ka-wahine</i>	Another name for Lea.
<i>Moku-hāli‘i</i>	Another name for Kū-moku-hāli‘i
* <i>Kū-pā-‘ai-ke‘e</i>	God of canoe makers (Kawaikaumaiikamakaokaopua 1922; Pukui and Elbert 1986). Elbert and Pukui (1971:391) note that Kūpā‘aikē‘e “was also worshipped as the inventor of the adze.”
* <i>Kū-ka-‘ie ‘ie</i>	(Malo 1903)

The process of finding the right tree to create a canoe varies among historians. Malo (1903) suggests a man observing a tree he thinks would be good, to which he then consults a *kahuna kālaiwa'a*. Meanwhile, Kalokuokamaile, Fornander, Holmes, and Henriques cohesively write that consultation with a *kahuna kālaiwa'a* is done prior to finding or coming across a tree (Fornander 1918-1919; Henriques 1926; Holmes 1981; Kawaikaumaiikamakaokaopua 1922). Despite this slight difference, the *kahuna kālaiwa'a* is always consulted when a canoe is requested to be made, and once it is agreed upon, the *kahuna* begins his rituals. First appeasing his primary god, the *kahuna* prepares *mōhai* (offerings) of a pig, a red *kūmū* fish, a black fish, and other items including coconuts and *'awa* (*Piper methysticum*) (Malo 1903). Coupled with the *mōhai* are *pule* (prayer) and the commitment of sleeping next to the shrine in the *hale mua* (men's eating house) until a sound tree is promised (Henriques 1926). The *kahuna* will then know when to make his ascent *mauka* once he dreams of a well-dressed male or female. In the case that the *kahuna* has a dream of a man without a *malo* (loincloth) or a woman without a *pā'ū* (skirt), it indicates that a tree is rotten and not useful, thus requiring the *kahuna* to remain in ceremony until a good omen is received (Malo 1903). Henriques' informant, Kealakahi, noted that this ritual would last roughly three days and on the fourth day is when the *kahuna* made his way up to the forest (Henriques 1926).

The Ascent to the Koa Forest

Once the *kahuna*'s dream revealed to him that his trip into the forest would be successful, preparations for the trip upland were made. The process of finding, felling, and hewing a *koa* often took months in the forest and required the party to prepare all the necessities. Kalokuokamaile records the importance of finding a water source next to the work area, which was considered lucky if a spring was found about a mile away. Kalokuokamaile also lists the other preparations that were needed to be carried into the forest "such as adzes, sleeping kapas, poi, fish, calabashes, water bottles, and ropes" (Pukui and Beckwith 1922). Malo, Kalokuokamaile, and Henriques share that once coming upon a suitable tree, the *kahuna* and his crew set up their temporary camp. Kalokuokamaile however, provides greater detail of how felling the first tree they came across was made into a shelter. Provided below is the Hawaiian from Kalokuokamaile's original articles published in *Ka Nūpepa Kū'oko'a* on *Ke Kalaiwaa Ana Ame Kona Mau Ano* and English translations done by Mary Kawena Pukui and Martha Beckwith (Kawaikaumaiikamakaokaopua 1922; Pukui and Beckwith 1922):

I ka hina ana aku la o ka laau ilalo, o ia ka wa e ana ai oe i ka loloa o ka ili o ka laau koa, elike me kou makemake 8 kapuai paha a i ole 9 paha kapuai ka loa. Alaila, okioki paukuku apuni, alaila, mahele iho ma ke aloe like no me ka lole ana o ka ili bipi. A ina i hemo pono na ili elima a eono paha ua aneane no ia e lawa no na kanaka he umi. No ka mea, o ka laau waa e okiia ana he laau nunui a hookah kanaka anana puni, a kapa'i ka lua o ka kanaka.

O ia hoi, he muku paha ke kapa'i a he iwilei paha. A makaukau keia mau mea, ooki na laau pou hale elua, a kau iho ai ke kaupoku, a hoomoe mai no hoi na wahi laau o'a ame na wahi laau kaola. Aole hoi o ke kaula, he nui ke kaula o ke ie; apau keia mau mea i ka paa hookau ka ili koa iluna o ka hale. Me ka hooponopono maikai ana i ka ili ko ai mea e palahalaha maikai ai ka ili koa apau na ili ko ai ka uhia, hookau iho i mau laau kaola maluna iho i mea e mohala mau ai ka papaa ili, elike me ka piula hale. A hiki i kona maloo ana, aole ia e upiki hou.
(Kawaikaumaiikamakaokaopua 1922)

When the tree fell that was the time to measure out the length of the bark of the tree, any length that one desired, eight or nine feet in length. Cuts were made down the front like a cut made when skinning beef. If five or six pieces of bark peeled off nicely that was almost enough for ten men, because the tree that was being cut for a canoe could be embraced by a man with more to spare that is, about one and a half or perhaps a yard more. As soon as these were ready, posts were cut for the two side posts, the roof put on and the rafters and beams laid on. There was no worry about ropes as there were an abundance of ropes, the ieie vine. When this was completed, the koa barks were laid onto the house, care was taken to see that the koa bark laid nice and flat. After the koa barks were laid, poles were laid on them to flatten them like the shingles of a house. Then when they dried they did not curl up again. (Pukui and Beckwith:5)

Kalokuokamaile continues to emphasize the importance of completing the shelter before dark due to the drastic differences in the living conditions of the forests and the shores:

2. Background

A ina aia no iluna ka la, pono e paina liili; aka, ina ua ahiahi loa, pono e haalele ka ai ana, a paa ka hale i ke kukulu. No ka mea, o ka hale ka mea nui. E pono e paa ia mamua o ka poeleele ana. No ka mea, aole like ka noho ana o ke kuahiwi me ko kahakai nei, ka pumehana. O ka noho ana o ke kuahiwi he ua liili, aia iloko o ka ohu, he ua liili aia iloko, o ka noe, he ua liili aia iloko o kea o e po'ipu ana, ame ka ua u-he hana mao ole ana.

(Kawaikaumaiikamakaokaopua 1922)

Holmes (1981) adds that the temporary shelters were usually lean-to or tent-shaped with layers of ferns as flooring. Once the shelter was complete, the real work began. Locating the perfect tree not only required the *kahuna*'s expert knowledge of the shape, color, density, and grain of a *koa*, but it also involved the expertise of a forest bird known as the *'elepaio* (*Chasiempis sp.*).

Consulting The 'Elepaio

The *'elepaio* were important consultants to follow and observe as this species was also a *kino lau* (many body forms) of Lea and depending on its behavior, indicated if the tree was rotten or suitable. While the rest of the historians (Fornander 1918-1919; Kawaikaumaiikamakaokaopua 1922; Malo 1903) recall the consultation of the *'elepaio* after the felling of a tree, Henriques' (1926) shares how the *'elepaio* is watched for two days, then for three more days, the *kahuna* followed the bird taking note of its behaviors before the felling. A detailed description of behaviors that a *kahuna* would encounter is provided by Fornander in his *Collection of Hawaiian Antiquities and Folk-lore* below:

If the bird darted down and perched on the trunk of the tree and then ran along the trunk to the other end, the canoe-hewing priest would remark: "The canoe is perfect." The conduct of the bird in running direct from the base to the end was the sign which enabled the priest to pronounce it perfect. Where the bird traversed was the top opening of the canoe. Supposing that the opening of the canoe which the bird apparently intended was underneath, the bird would fly to a certain height, then circle over the tree, the priest would understand that it was urging the turning of the tree. But if the opening that the elepaio intended to be was on the side, it would fly in that direction. On the other hand, if the bird came and stood on the trunk of the tree intended for a canoe, if it continued to remain there for some time, the canoe-hewing priest knew that a defect was at that point. If the bird again ran from the trunk and stood in another place, then another defect was at that locality, and thus the bird would indicate all the defects in the canoe, whether it be rottenness, hollow-cored, or knotted. In this way the canoe-hewing priest was made aware of the defects of the [tree for a] canoe. (Fornander 1919-1920:144)

The Cutting and Felling Rituals

Before the cutting and felling of a *koa*, the *kahuna kālaiwa'a* adhered to additional rituals to appease his god(s). Malo (1903), Kalokuokamaile (1922), and Henriques (1926) cohesively record the offering of a pig at or near the base of the *koa* to be felled followed by additional *mōhai* and *pule*. Both Malo (1903) and Kalokuokamaile (1922) offer examples of *pule* that address the canoe gods with a constant *mōhai* of red *kūmū* fish and a pig. Malo (1903) also adds coconuts and *'awa* being offered in addition to the fish and pig. In Kalokuokamaile's (1922) account of his first canoe-building experience, he was advised by his father to gather a red loin cloth in addition to the pig and fish. Continuing with Malo's process, the next day the *kahuna* cooked the pig next to the base of the *koa* tree to be felled, and only after eating the pig did the *kahuna* examine the tree, recited his prayer, and began the felling process. " *O Ku-pulupulu, Ku-ala-na-wao, Ku-moku-halii. Ku-ka-ieie, Ku-palake, Ku-ka-ohia-laka...* *O Lea and Ka-pua-o-alaka'i*, listen now to the ax. This is the ax that is to fell the tree for the canoe..." was a phrase recited by the *kahuna kālaiwa'a* before the *koa* was cut and toppled (Malo 1903). Malo provides additional details regarding the cutting and felling process:

The *koa* tree was then cut down, and they set about it in the following manner: Two scarfs were made about three feet apart, one above and one below, and when they had been deepened, the chips were split off in a direction lengthwise of the tree... When the tree began to crack to its fall, they lowered their voices and allowed no one to make a disturbance. When the tree had fallen, the head *kahuna*

If the sun was still high, it was well to eat a little, but if it was rather late in the afternoon, it was better to leave out the eating until the shelter was built. The shelter was very important and should be completed before dark because living in the mountains was not warm like living at the shore. With life in the mountains, there were showers in the fog, showers in the mist, showers in the heavy clouds overhead and the rains that pour unceasingly. (Pukui and Beckwith 1922:4-5)

mounted upon the trunk, ax in hand, facing the stump, his back being turned toward the top of the tree. Then in a loud tone he called out, "Smite with the ax and hollow the canoe! Give me the malo!" Thereupon the kahuna's wife handed him his ceremonial malo, which was white; and, having girded himself, he turned about and faced the head of the tree. Then having walked a few steps on the trunk of the tree, he stood and called out in a loud voice, "Strike with the ax and hollow it! Grant us a canoe!" Then he struck a blow with the ax on the tree, and repeated the same words again; and so he kept on doing until he had reached the point where the head of the tree was to be cut off. At the place where the head of the tree was to be severed from the trunk he wreathed the tree with ie-ie (*Freycinetia Scandens*). Then having repeated a prayer appropriate to cutting off the top of the tree, and having again commanded silence and secured it, he proceeded to cut off the top of the tree. This done, the kahuna declared the ceremony performed, the tabu removed; thereupon the people raised a shout at the successful performance of the ceremony, and the removal of all tabu and restraint in view of its completion. (Malo 1903:169)

Kalokuokamaile's *pule* is recited below with the translations done by Pukui and Beckwith (Kawaikaumaiikamakaokaopua 1922; Pukui and Beckwith 1922):

<i>E Lea ka wahine kua waa</i>	O Lea, woman who builds canoes,
<i>Akua kalaiwaa</i>	Goddess of canoe making.
<i>I pii mai nei au e kua</i>	I have come up to cut a tree for a canoe.
<i>E oki i kuu laau waa</i>	Here is my gift, a free will offering,
<i>Eia ka 'u uku, alana</i>	A sacrifice for you, o Lea
<i>Mohai ia oe e Lea,</i>	Here is a red fish, a red loin cloth
<i>Eia ka i 'a ula, malo ula</i>	Grant me much skill,
<i>E haawi mai i ka ike a nui</i>	Strength and wise thinking,
<i>Ka ikaika, ka noonoo,</i>	Grant me patience.
<i>Haawi mai ia 'u i ke aholoa</i>	All hindrances and obstacles,
<i>O na alalai o na ke 'ake 'a</i>	In front, behind
<i>Mamua, mahope</i>	And on all sides of the tree which I cut,
<i>A ma na aoao o kuu laau e oki ai</i>	Make them be trifles,
<i>E hoolilo ia lakou i opala</i>	Make the strokes of my adz strike well,
<i>E hoopili pono i ka maka o ke ko 'i</i>	Let the chips fly at each stroke
<i>Ma kuu wahi i makemake ai,</i>	Until the work is finished.
<i>Aole hoopakua i kuu ko 'i</i>	Amama, the prayer is freed
<i>Pa no lele ka mamala</i>	(Pukui and Beckwith 1922:10).
<i>Ahiki i ka pau ana</i>	
<i>Amama ua noa</i>	
<i>(Kawaikaumaiikamakaokaopua 1922)</i>	

In Kalokuokamaile's (in Pukui and Beckwith 1922) process of felling the tree, he recalls being instructed by the head *kahuna* to "Dig under the stump which you had cut" and at this point, Kalokuokamaile knew to bury the red fish and red loin cloth which signaled it was time to cook the pig. Kalokuokamaile details the work that needed to be done before the felling, one of which was preparing *hāpu'u* (*Cibotium menziesii*) fern stumps that acted as cushioning for the *koa*. This was to ensure the protection of the wood from the fall. After the *koa* was felled, the *kahuna* left the adz in the stump of the tree until more work was needed to be done. When it was time for Kalokuokamaile to consume the pig, the head *kahuna* recited the chant below and offered a piece of the nose, the tail, the ears, and internal organs to Kalokuokamaile to eat and free the *kapu*.

<i>E Lea ka wahine kua waa</i>	O Lea, woman who builds canoes,
<i>Akua kalaiwaa</i>	Goddess of canoe making,
<i>A me Mokuhalii, Kupaaikée</i>	And Mokuhalii and Kupaaikée
<i>Na akua kane kalaiwaa</i>	Male Gods of canoe making,
<i>Eia ka puua</i>	Here is pork,
<i>He puua uku, mohai, alana ia oukou</i>	A pork gift, a sacrifice, an offering
<i>Na Kalokuokamaile</i>	From Kalokuokamaile
	Grant him much skill,

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*E haawi i ka ike a nui, ka ike mana, ka
mana palena ole
A nolaila, ke aie nei oukou i ka puua a
Kalokuokamaile
Amama ua noa
(Kawaikaumaiikamakaokaopua 1922)*

Skill and mana, unlimited mana,
So therefore you are obliged to
Kalokuokamaile for his pork.
Amama it is freed
(Pukui and Beckwith 1922:11)

Although the subtle difference between Kalokuokamaile's and Henriques' recollection of consuming the pig was either before or after the felling, their accounts are cohesive in that after the felling, the next part to tend to was the branches and the *ēulu* or the top of the tree (Henriques 1926; Kawaikaumaiikamakaokaopua 1922). Holmes (1981) further details that it wasn't until after this final severing of the *ēulu*, did the *kapu* surrounding the felling process become freed.

The Final Hewing Process

Before the rough hewing began, the *kahuna kālaiwa'a* would take measurements and work out a blueprint of what the finished canoe would look like, taking note of any further rot, and determining which part of the trunk would become the top and bottom of the canoe. After this initial planning was complete, further restrictions were removed allowing other *kālaiwa'a* to begin shaping the log (Holmes 1981; Malo 1903). Most of the accounts recording this process starts with tapering both ends giving the initial shape of the canoe. The exterior sides and *iwikuamo'o* (keel) (Kawaikaumaiikamakaokaopua 1922) are next to be shaped and once done, the crew would utilize different techniques in turning the log over, which was dependent upon the number of people available to help, as well as the size of the log. One method required a stick with a rope attached to the top. Depending on the log, this method was considered easy as angling the stick under the log and pulling on the rope to turn the log over. In other cases, this stick and rope technique required a hole to be made where the opening is to be, then inserting the stick into the hole and pulling on the rope (Holmes 1981; Kawaikaumaiikamakaokaopua 1922; Malo 1903).

Kalokuokamaile's steps in the hewing process differ in that he notes turning the log over and starting on the side where the mouth will be up. He details how the trunk is cut into *paukū* (sections) from stern to prow or prow to stern, then hollowed out:

*I kou paukuku ana, e paukuku oe a loaa ka
i'o ulaula, mai kahi niao a i kekahi niao me
kou malama loa i ke oki ana o moku loa
auanei kekahi niao, a na ia niao e hoouku i
ka waa i ka wa e pahola aku ai i ka waha o
ka waaa. A ua kapaia kela paukuku, he
momona, a he kea; a i ka pau ana i ka
paukuku, e wawahi i kela paukuku me ka
koilipi, mai mua a hope o ka waa.*

*Alaila, pahola oe i ka waha me ke ko'i holu,
e hoiliwai ana a pololei. O ka maikai o keia
hana ana, o ka maikai no ia apau ka waa.
Ua pau ae ola i ka pahola ka waha, o ka
auwaha koe ialoko.*

*O ka hana ana iloko, e okioki huinakolu oe,
mai kahi niao, a i kekahi niao, mai hope mai
a mua. Aole okioki loloa i ka huinakolu,
mahope pipili a ulolohi ka uhau ana a ke
koilipi. (Kawaikaumaiikamakaokaopua
1922)*

In cutting the sections, they were cut down to the red wood from one rim to the other but care was taken not to cut into the rim and so making the canoe smaller when the opening was hollowed out. These sections were called *momona* or *ke'a*. After the cutting was done, the sections were broken up with a sharp adz from prow to stern of a canoe. Then the opening was begun with a bent adz (*ko'i holu*) to make the opening even and straight. When this was well done its work would be good until the canoe was completed. The opening was finished and so the next step was to hollow out the log.
(Pukui and Beckwith 1922:6-7)

The interior shaping and hollowing out required further measurements for the different parts of the canoe. The *kahuna kālaiwa'a* would determine where the *pepeiao* (comb cleats) and *wae* (U-shaped spreader) would be located by utilizing traditional anatomical measurements such as *anana* (distance from fingertips of outstretched arms), *muku* (distance of fingertips from one hand to the elbow of the other arm stretched at the sides), *iwilei* (distance from the collarbone to the tip of the middle finger of the other arm stretched at the sides), *kīko'o* (span between the extended tips of the thumb and forefinger), and *poho* (half of a *kīko'o*) (Holmes 1981).

The hollowing out of the canoe was the last step in this process. As described by Kalokuokamaile (1922), once the hollowing was finished, the canoe would be turned over, the *iwikuamo'o* (lit. backbone; underside of canoe) would be shaped, and lastly, the log turned over again to finish hollowing the interior. Once completed, the hewed canoe would be roped up and hauled from the uplands to the coast for finishing.

Hauling the Roughly Hewn Log to the Coast

Hauling the roughly-hewn canoe from the forest to the coast was, perhaps, the most perilous part of the canoe carving process. Depending on the size of the log, an experienced leader and many skillful hands were required to work in unison to bring the canoe down safely and intact. Kalokuokamaile specifies that *kaula* (rope) which was both thick and long was one of the most important tools used in this process. Once the decision to bring the log down to the coast was made, the workers left the forest and made their way to the shore to initiate the preparation of the *kaula* and assemble helpers that would aid in hauling the semi-hewn log to the shore. Those who assisted in hauling the canoe to the shore were known as *po'e kanaka kauō* (haulers) and *pale wa'a* (canoe guides), the latter of whom, as reported by Kalokuokamaile, was charged with safeguarding the canoe during transportation and preventing injury (Kawaikaumaiikamakaokaopua 1922). Once enough *kaula* was prepared and on a clear sunny day, a great feast was prepared. Preceding the actual hauling, further rituals were held as the course of hauling could present obstacles and potential dangers. The process of hauling was overseen by the head carver, who was situated behind everyone (no other persons could walk beside or behind the head carver as that space was reserved for the *akua*), and the designated *paha* (chant to ease the work) chanter. When it came to the hauling, everyone enjoyed the process, men, women, and children, who sometimes rode on the canoe while it went down a slope, as if one was surfing (Holmes 1981; Kawaikaumaiikamakaokaopua 1922). Holmes (1981:39) provides additional terminology in Table 3 for the specific duties a hauler was responsible for.

Table 3. Hawaiian terminology associated with the different types of hauling duties.

Hawaiian Terminology	Description
<i>Kanaka Kailili</i>	Men who held the <i>kaula kailili</i> (check ropes, two on each side of the <i>kaula ko</i>) to keep the snout of the log on the right course.
<i>Kanaka Pu</i>	Men who kept the hauling rope taut and straight.
<i>Kanaka Ko Waa</i>	Multitude of men who did the hauling that were arranged to the left and to the right of the <i>kaula ko</i> (thick rope attached to <i>maku'u</i>).

(Malo 1903:246) states that the process of hauling the *koa* down “was a scene of riot and tumultuous joy.” To keep the work joyous and the workers focused, the *paha* called out in chant to maintain the group’s lively energy. As evidenced in the following *Mele Ho'okanikani-Pihe*, the hauling of the *koa* out of the forest was not a mundane act. Much vigor, focus, and energy were needed because in the Hawaiian worldview, moving the *koa* was the literal moving of the god. Malo (1903:247) related the following *Mele Ho'okanikani-Pihe*, which is still used today amongst the Hawaiian community to rally people together around a particular cause:

One—	<i>I ku mau mau!</i>	Stand up in couples! It moves, the god begins to run!
All—	<i>I ku wa!</i>	Stand at intervals!
One—	<i>I ku mau mau!</i>	Stand in couples
	<i>I ku huluhulu!</i>	Haul with all your might!
	<i>I ka lanawao!</i>	Under the mighty trees!
All—	<i>I ku wa!</i>	Stand at intervals!
One—	<i>I ku lanawao!</i>	Stand up among the tall forest trees!
All—	<i>I ku wa!</i>	Stand at intervals!
	<i>I ku wa! huki!</i>	Stand at intervals! and pull!
	<i>I ku wa! ko!</i>	Stand at intervals! and hau!
	<i>I ku wa a mau!</i>	Stand in place! And haul!
	<i>A mau ka eulu!</i>	Haul branches and all!
	<i>E huki, e!</i>	Haul now!
	<i>Kuli'a!</i>	Stand up my hearties!
	<i>Umi'a ka hanu!</i>	Hold your breath now!
	<i>A lana, ua holo ke akua!</i>	It moves, the god begins to run!

The success of the hauling relied heavily on working in tandem with everyone, being alert, and listening to the calls that were being made by the *pale wa'a* situated at the front and back of the canoe. Kaloluokamaile shared that “as the

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men called they said, ‘toward Kohala,’ or ‘toward Kau,’ but never to the north or south” to indicate the appropriate direction in which to steer the canoe (Pukui and Beckwith 1922:15). The path taken by the haulers were often pre-cleared and the shortest and most practical route, being only as wide enough for the canoe and haulers to fit. Kalokuokamaile (1922) further shares that it was a waste of time and labor to widen the path as perhaps only two canoes would ever pass through that same route, indicating that a new path was most likely cleared each time a log was hauled (Holmes 1981; Pukui and Beckwith 1922). Because hauling took a lot of time and energy, it was also customary for food to be left at designated resting places that the canoe would be hauled to. Often these resting places were near water sources.

The hauling would proceed and if ‘a’ā flows were encountered, logs known as *ipuwai* (wood rollers) were laid over the rough ‘a’ā to lessen the damage to the canoe. In the case that a canoe did become damaged beyond repair during any part of the hauling process, it was abandoned altogether and left to decay. The hauling ended at the *hālau wa’ā* (canoe shed) located near the coast where the final shaping and assembling of the other parts took place (Holmes 1981).

Whereas during the Precontact and Early Historic periods, hauling the *koa* out from the forest was done entirely by hand, as new technologies emerged including carts and wagons, *kālaiwa’ā* have and continue to adapt their traditions to ease the workload. As evidenced in the photo below (Figure 19), a partially hewn canoe is transported on a wagon frame in Hōnaunau, Kona.

As demonstrated above, the process of selecting, felling, shaping, and hauling a *koa* out of the forest to be made into a functioning *wa’ā* was a deeply spiritual and arduous undertaking. Thus, the continuous use of *wa’ā koa* today and into the future stands as a testament to the significance of this practice and the necessity of obtaining appropriate *koa* trees to ensure the continuation of this long-standing customary tradition.



Figure 19. Five men preparing to haul an unfinished canoe to Hōnaunau, South Kona, to be finished; Hawai‘i. Photo courtesy of K. P. Emory, Bishop Museum Archives.

CULTURE-HISTORY OF KAPĀPALA AHUPUA‘A

Situated along the eastern slopes of Mauna Loa, the expansive *ahupua‘a* of Kapāpala today covers approximately 172,780 acres of the northeastern section of the Ka‘ū District (Figure 20). Kapāpala is also one of just three *ahupua‘a* that encompasses the summit region of Mauna Loa (Handy et al. 1991). Historically, the land of Keauhou which included Kīlauea volcano and comprised of some 50,740 acres was an ‘ili kūpono (independent subdivision) of Kapāpala (Maly and Maly 2004). However, Keauhou during the 1848 *Māhele Āina* was given the status of an independent *ahupua‘a* and is today, the land that separates the districts of Ka‘ū from Puna. Thus, prior to 1848, Kapāpala contained well over 223,000 acres that included vast tracts of forest occupying the central region and flanked on either side by numerous lava flows originating from Mauna Loa and Kīlauea.

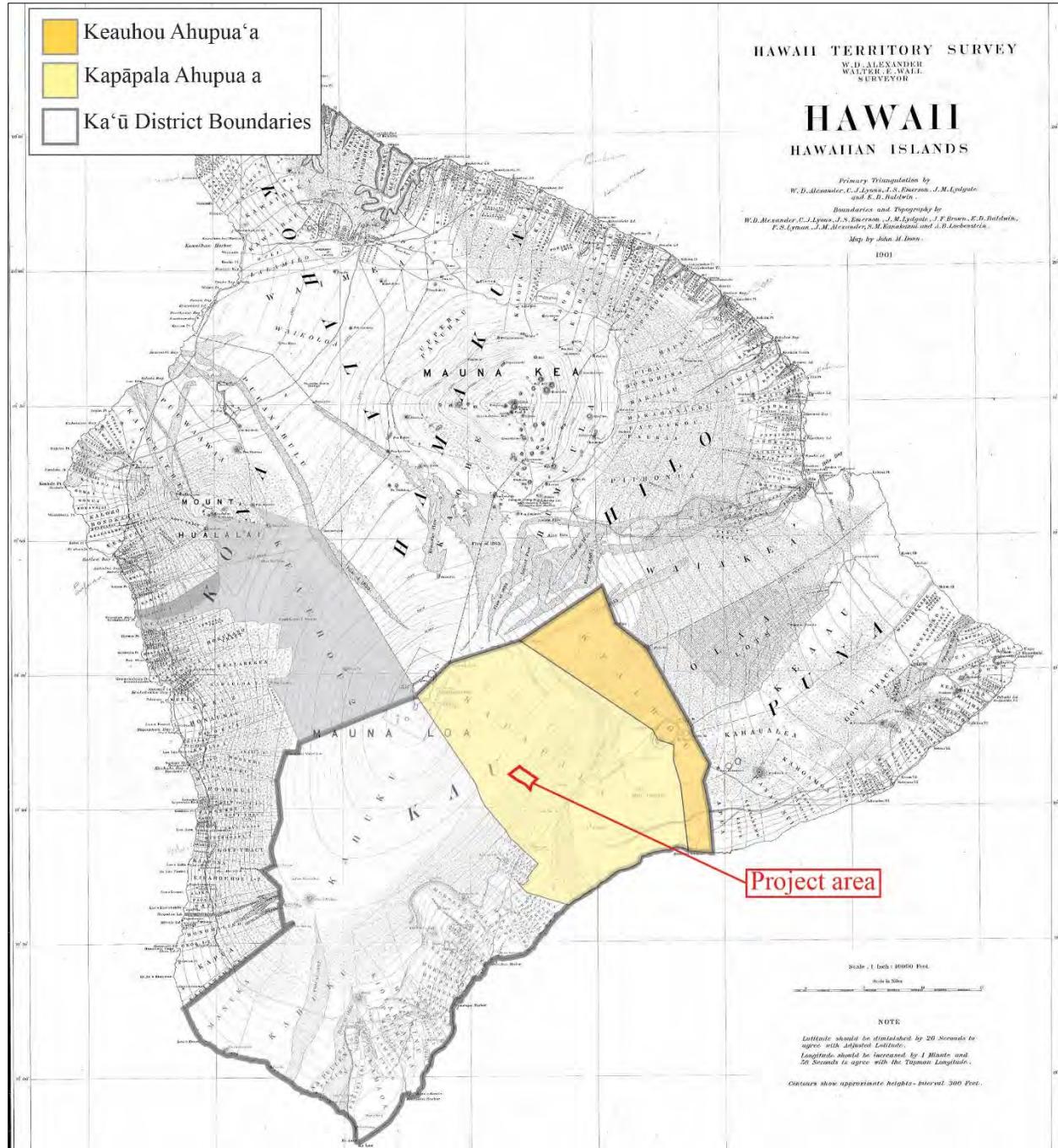


Figure 20. Hawai‘i Registered Map 2060 from J.M. Donn (1901) showing KKCMA project area in Kapāpala, Ka‘ū.

2. Background

In their appraisal of native horticultural practices in the 1930s, Handy et al. provided the following geographical description of Kapāpala Ahupua‘a:

Between the northeasterly *ahupua‘a* of Kapapala and Kilauea, the upland area of active volcanic craters, there was never any cultivation, so far as we could learn. Below Kao-iki Pali the country is covered with lava, and in the forest above the *pali* from Kapapala to Ohiakea the bird snarers or feather hunters had their huts, but no taro was grown. On the land flanking the present Kapapala Ranch, which is now in sugar cane, dry taro used to be grown on the sloping *kula*, on the steep hillsides of gulches, and in the forest lying behind. Forest taro was here referred to as *ulu la‘au* (forest growth), and that on steep slopes as *pi‘ina* (climbing) (Handy et al. 1991:613).

The name Kapāpala refers to the endemic *pāpala* plant (*Charpentiera sp.*), which is found on all of the main Hawaiian Islands in both mesic and dry forests (Pukui et al. 1974; Rock 1913). Often used in the practice of ‘ōahi (firebrand tossing), the buoyant, soft fibrous wood of the *pāpala* was carried to selected coastal precipices on dark moonless nights, lit on fire, then tossed over the cliff where it was carried on the wind to create a fiery aerial display enjoyed by the people (Krauss 1993; Rock 1913). Krauss (1993:96) explains that “the central core of soft pith of the branches burned rapidly, causing streams of sparks to shoot out like fiery rockets.” Krauss (1993) further adds that “some of the embers dropped into the sea; others were intercepted by some of the spectators in canoes in the sea below the cliffs and used to brand themselves as a form of tattooing to commemorate the occasion...such a person was looked upon as a hero.”

Whereas Pukui et al. (1974) associated the place name Kapāpala with the endemic *pāpala* plant, some traditional *mo‘olelo* also identify Kapāpala as the name of a chief. In one such *mo‘olelo*, the chief Kapāpala was killed by the *akua* Pele, who is considered to be “the most important *kupuna* for all ‘ohana of Ka‘ū” (Handy and Pukui 1998:29; Westervelt 1916). In another *mo‘olelo*, Kapāpala was “a champion warrior” who was defeated by two brothers Ka-Miki and Maka‘iole (Kin In and Pukui 2021). Another possible interpretation of this place name may be associated with its geographical placement amidst a volcanically active landscape—a region belonging to Pele—Hawai‘i’s goddess of lava. As Kapāpala is flanked on its western and eastern limits respectively by the volcanically active Mauna Loa and Kīlauea, this ‘āina (land) has experienced Pele’s numerous ‘ōahi (fiery displays). Thus, the name Kapāpala may be indicative of Pele’s fiery displays, the presence or abundance of the *pāpala* plant in this area, or may be a name derived from a local chief or warrior.

The Environmental Setting and Resilient Kinship Networks

Celebrated for its rugged lava-coated landscapes, windswept plains, expansive forests, and excellent fishing grounds, the unique physical environment of Ka‘ū “was a potent factor in conditioning, if not determining, the form and nature of the dispersed community (‘ohana) (Handy and Pukui 1998:18). Handy and Pukui further elaborated on this notion stating:

Ka‘ū is the most rugged, the most forbidding, of all the areas of habitation in these islands, with its lava strewn coasts, vast windswept plains that are almost treeless, beyond which rise the majestic slopes of Mauna Loa, deeply forested just above the plains, but snow-covered towards the summit in winter months. The toughness of Ka‘ū folk was the result of their rugged homeland and hardy life in wresting a living from land and sea. It was affected certainly by the extremes of temperatures as between night, when the breeze and winds flow seaward from frosty altitudes, to midday when the black lava of plains and shore is furnace-hot from the sun. Handy and Pukui (1998:xvi)

Central to surviving in this forbidding landscape was the “dispersed community of ‘ohana [lit. family], of relatives by blood, marriage and adoption” who resided within different *wao* (environmental zones) and had access to a diversity of unique resources (Handy and Pukui 1998:2). Those ‘ohana residing at the coast were known as *ko kula kai* (of the seaward slopes) and those living in the uplands were dubbed *ko kula uka* (of the upland slopes). Understanding the nuances of each *wao* was vital to the people of Ka‘ū, who relied solely on their environment to furnish all their needs. Each *wao* extended horizontally across the district and marked vegetation and rainfall change. Handy and Pukui (1998:19) provide a cartographic sketch delineating the various *wao* in Ka‘ū (Figure 21).

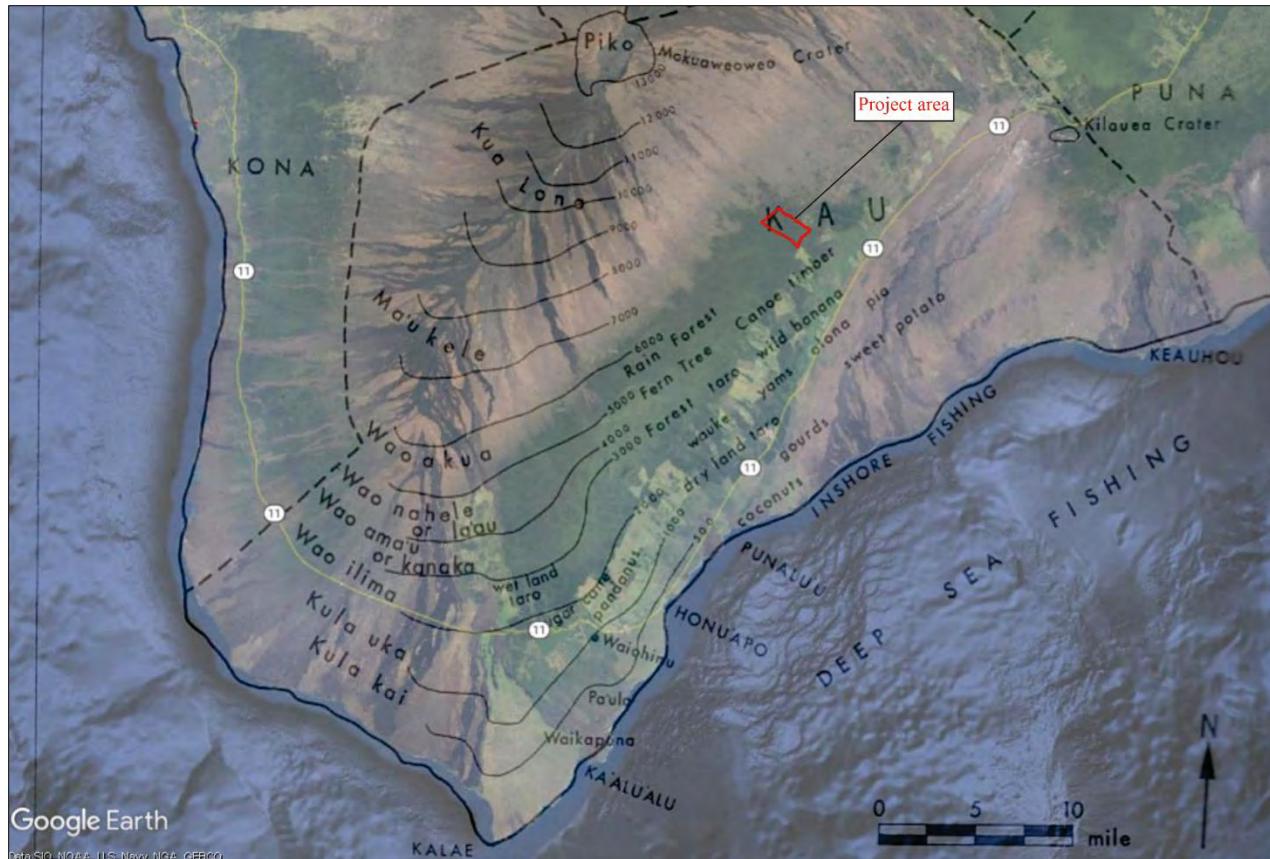


Figure 21. Handy and Pukui's (1998:19) cartographic sketch overlaid on a Google Earth aerial showing the *wao* in Kā'ū.

Based on the elevational location, the project area is situated at the upper fringes of the *wao amau*/*wao kanaka* and extends through the *wao nahele*/*wao lāau* and into the *wao akua*. In characterizing these zones, Handy and Pukui wrote:

Beyond the open slopes (*kula*) become fern lands, then gradually merge with the lower forest (*wao*). In this zone where fern bushes and small trees prosper other varieties of upland taro requiring more water were cultivated, under mulch to keep in the moisture. This continued right back into the lower forest. Here were the wild bananas, wild yam (*Dioscorea*), arrowroot (*pia*); and tree fern (*Cibotium*), whose starchy core was eaten, extending down into this zone from the rain forest.

These zones were not fixed as to altitude. On the east, the wet uplands were wetter and extended lower than on the west, which was both beyond the range of heavy precipitation from trade winds and cut off somewhat by the shoulder of Mauna Loa running back to Kalae. (Handy and Pukui 1998:20-21)

Beyond the zone of habitation of this land of wide spaces on a clear day, the eyes of our deep sea fisherman will see the heavily forested zone (*wao akua*, jungle of gods), where his great *koa* (*Acacia koa*) trees cut for canoe hulls are growing. Beyond that the verdant rain forest, frequently swathed in cloud. (Handy and Pukui 1998:22)

The exchange of resources procured from the various *wao* via kinship networks and the movement of the 'ohana across the 'āina (land) for economic or social affairs were pivotal to surviving in this environment. Handy and Pukui (1998:18) express that "[t]he dispersal of the households comprising the extended family ('ohana), the types of structure constituting the domiciles, the means of livelihood and exchange of products of sea, land, and handcraft between individuals and households were all affected by topography, rainfall and vegetation, the nature of the shore and the sea offshore, by climate and weather and the cycle of seasons." This exchange of resources via kinship networks detailed by Handy and Pukui (1998) offered increased access to geographically dispersed resources, while at the same time buffering against environmental and social perturbations (Allen and McAnany 1994). This network system functioned as a unit in external economic and social affairs, such as placing the burden of taxes levied by the *ali'i* during the annual collection of tribute (*Makahiki*), not on the individual or single households, but on the entire 'ohana (Handy and Pukui 1998).

Ethnographic Accounts of Settlement of Ka‘ū and ‘Aumākua Worship

The extended kinship networks were not only crucial to thriving and expanding in this landscape but played a major role in the settlement of this district. The Hawaiian proverb, “*Hilina‘i Puna, kālele ia Ka‘ū*” describes how the districts of Ka‘ū and Puna were settled by an extended family (Pukui 1983:107). Pukui further elaborates:

The ancestors of these two districts were originally of one extended family. The time came when those of each district decided to have a name of their own, without breaking the link entirely. Those in Ka‘ū referred to themselves as the Mākaha [piece] and those in Puna as the Kumākaha [in a state of fierceness]. (ibid.)

Pukui attributes the ancestor named ‘Ī as one of the progenitors of this extended family. The proverb, “*Ka hālau a ‘Ī*” literally translated as “the house of ‘Ī” describes the spreading of this family throughout Hāmākua, Hilo, Puna, and Ka‘ū (Pukui 1983:141). Another ancestor mentioned in traditional lore is the shark god Kūa. The proverb “*Na mamo i ka halo o Kūa*” relates that Kūa, a great shark god mated with his human sister and bore children (Pukui 1983:247). Kūa is said to be both an ancestor as well as a protector of the district (Pukui 1983). Emerson (1892:8) argued that the “shark was perhaps the most universally worshipped of all the aumakuas, and, strange to say, was regarded as peculiarly the friend and protector of all his faithful worshippers.” Ancestral deity worship is considered a quintessential spiritual practice of the Native Hawaiians of old, and it stands today as a heritable custom, belief, and connection to the past preserved by rich oral traditions, many of which are associated with mythological tales. One such story concerns the famous shark war that occurred at ‘Ewa on the island of O‘ahu in which a power struggle ensued among a group of legendary and primal sharks that resulted in the banishment of the cannibalistic sharks. Five of the shark ‘aumākua involved in the battle were said to be from Ka‘ū, and are identified below (in addition to three other sharks also said to be of Ka‘ū):

Kealiikaua (k) is the hero of the great shark war. He is born at *Ninole, Kau*, on Hawaii. He acts as the friend of man, his great work being to travel about the islands and slay all those sharks who feed on human flesh. Four sharks accompany him.

Kalani (k) is “born on the coast of *Waiohinu* (*Kau* district) from the eye of his mother. His blood has been seen on the forehead of some who worshipped him. He guarded all the people of *Kau* from the other sharks who might harm them. He went to the great shark war at *Ewa*, Oahu, with his kinsman and friend *Kaholeakane*. They were swallowed up by *Kuheimoana* in this war. The little *Kalani* went first into the mouth of the monster, followed by his larger friend, whose size forced the monster to disgorge him. As he came out, the nimble *Kalani* darted out too. Then they swam into shoal water and thus led *Kuheimoana* to her fate. She got stranded on a shoal and was kept from the battle. *Kalani* went too near the shore and had a portion of flesh cut from his back by the people of *Ewa*, who ate it.” In another version, two pieces of his flesh form the spouting horn at *Kealae*. The natives say “If a man in a canoe wears anything red, *Kalani* will pursue the canoe and upset it.”

Kaholiakane [Kaholeakane] (k) is companion to *Kalani* in the great shark war.

Kua (k) a *Kau* shark who joins *Kalani* in the shark war.

Kane (k) companion to *Kalani*.

Haloa, a shark of *Mahana, Kau*, who comes in his spirit form and teaches his *kahu* the medicine to use to cure diseases.

Humeke, of *Kaalualu, Kau*.

Mikololo, of *Pokini, Molilele cliff, Kau*. (Emerson in Beckwith 1917:511-512)

In addition to ‘Ī and Kūa, Handy and Pukui (1998:27) also identify other progenitors who served as ‘aumākua (ancestral god/guardian spirit) to specific families and manifested as the *ipu ‘awa ‘awa* (bitter gourd) and the ‘enuhe (caterpillar):

Believed to be local in origin were other forebears: that one from whose naval grew a gourd vine, originating in a certain cave, which spread over and peopled seven districts of Ka‘ū; another ancestor, identified with a particular hill, who appeared in the form of the caterpillars that feed upon the foliage of sweet potatoes, the staple of life in these districts.

For the Hawaiians of Ka‘ū—whose name has been translated by Handy and Pukui (1998) as “The [ka] Breast [‘ū]”—this beloved land upon which they built their lives shaped their worldview, beliefs, mannerisms, and customs. These people are celebrated in Hawaiian lore for their hardworking nature who labored willingly for their families and

chiefs but were most staunch in not tolerating mistreatment or abuse. Pukui (1983) provides several ‘ōlelo no ‘eau (poetical expressions) that cues us into the nature of this land and its people:

Uhiuhi lau māmane ka wai o Kapāpala.

Covered with *māmane* leaves is the water of Kapāpala.

The stream in Kapāpala, Ka‘ū often becomes very muddy. The people used to place *māmane* branches in the water to help the mud settle so that some drinking water could be obtained. This saying applies to a person who tries to cover up the wrongdoings of another. (Pukui 1983:313)

Ka ‘ū, ‘āina kipi.

Ka‘ū, land of rebels.

The people of Ka‘ū were known to rebel against oppression, even killing their own oppressive chiefs. (Pukui 1983:168)

Ka ‘ū, ‘āina kua makani.

Ka‘ū, a land over whose back the wind blows.

Ka‘ū is a windy land. (Pukui 1983:173)

Ka ‘ū nui kua makani.

Great Ka‘ū of the windblown back.

The wind always blows in Ka‘ū. (Pukui 1983:176)

Ka ‘ū mākaha.

Ka‘ū of the fierce fighters.

The district of Ka‘ū, Hawai‘i was known for its fierce and independent warriors. Kohāikalani, Koihala, and Hala‘ea, selfish and oppressive chiefs, were each destroyed by rebellious subjects. (Pukui 1983:176)

Ka ‘ū nui maka lepo.

Great Ka‘ū of dirty faces.

An expression of ridicule. Ka‘ū, Hawai‘i, is a dry, wind-swept district where clouds of dust rise into the air. (Pukui 1983:176)

The Hawaiian of Ka‘ū resiliently adapted to the environmental limitations of their ‘āina, a land where some of the most legendary and dramatic natural phenomena have and continue to occur. Handy and Pukui (1998) emphasize that:

This legendary setting must likewise be understood in specific detail as a pillar and gourd, certain rock formations, trees, volcanic and meteorological phenomena are *kupuna* (forbears). Of particular families and persons: relationship, tabus, in fact every phase of personal and family life, are contingent upon affinity arising herefrom.

LEGENDARY ACCOUNTS FEATURING KAPĀPALA

Traditional Hawaiian *mo ‘olelo* are key entry points to understanding the history and ideologies that have been attached to a specific place. The term *mo ‘olelo*, which means “succession of talk,” has many meanings, including story, tale, myth, history, literature, tradition, and legend (Pukui and Elbert 1986:254). For this study, the term *mo ‘olelo* is used to reference Hawaiian narratives that are mythological or legendary in nature. A review of *mo ‘olelo* that feature Kapāpala is important because *mo ‘olelo* aid in tracking important social and environmental change and are nuanced with ‘ike *kūpuna* (ancestral knowledge) and perspectives that remain relevant to a living culture (Kikiloi 2012). In some cases, *mo ‘olelo* can be expansive, and detailed, and are sometimes interconnected to other *mo ‘olelo* through certain characters or events. Furthermore, a review of *mo ‘olelo* sheds light on aspects of Hawaiian culture including historical figures, beliefs, traditions, *wahi pana* (legendary places), and place names, all of which contribute to an in-depth understanding of the people, their culture, and their connection to a place.

Many of the *mo ‘olelo* that feature the ‘āina of Kapāpala are intimately tied to Pele-honua-mea (also known as Pele), the *akua wahine* (female deity) of lava who established her home in the depths of Halema‘uma‘u (Handy and Pukui 1998). Kalākaua (1888) indicates that active worship of Pele was ongoing since at least the 12th century and that the abolition of the *kapu* system in 1820 had little to no effect on this practice, which remains ongoing. In addition to being revered as a goddess, Pele was also worshipped as an ‘aumakua by her descendants. According to Nimmo (1990:43), “most Hawaiians living in the volcano areas of Hawai‘i, the districts of Ka‘ū, Puna, and Kona, at the time of European contact traced their ancestry to Pele”. Pele is frequently and comprehensively referenced in historical and mythological

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literature. Likewise, traditional tales of Pele's migration to Hawai'i from Kahiki are many and varied. Because Pele's story is so well-recorded in Hawaiian mythology, she is sometimes perceived, by some, as a sort of mythic cultural manifestation. However, for many Native Hawaiians and especially those from Ka'ū, Pele, in her most absolute form, is the lava. She is tangible and continues to exact her mighty powers. She commands respect, for she is the creator of land, and continues to instill that sense of wonder and awe in the people who get to experience her powerful earthly creations. Handy and Pukui (1998) emphasize that:

It is profoundly significant that the Hawaiians of Ka-'u did not fear or cringe before, or hate, the power and destructive violence of Mauna Loa. They took unto them this huge Mother mountain, measured their personal dignity and powers in terms of its majestic and drama...They loved Pele, whose home was their land: they endured her furies, and celebrated the drama of creation with which they lived so intimately in the songs and dances of the sacred *hula*, which dramatizes the myth of the "Woman of the Pit" (the crater, Kilauea) and her "family." Embodied in cloud, thunder and lightning (Lono), in the forest and verdure (Wahine 'Oma'o, "Green Lady") in Hi'iaka "of living waters," the healer, and other cosmic terrestrial forces that encompassed them.

Historical literature tells us that with Pele's arrival and subsequent settlement, she transforms the islands. Kalākaua (1972:140) places the arrival of Pele and Hi'iaka during the reign of Kamiole, or more specifically, in approximately A.D. 1175, and notes that "every tradition refers to them as deities at the time of their arrival at Hawai'i." When Pele arrived on the shores of Hawai'i, she learned that a fire god by the name of 'Ai Lā'au already had jurisdiction over the island. As Westervelt (1916) explained, after landing at Keahialaka in Puna, Pele embarked towards the mountains in her desire to go at once and see 'Ai Lā'au who lived in Kīlauea. By the time Pele arrived at Kīlauea, she found 'Ai Lā'au's home vacant. Having observed Pele making her way towards him, 'Ai Lā'au was overcome by fear and dread and sought to escape. Pele went to Kīlauea and dug vehemently day and night until she was satisfied, thus establishing Kīlauea as her home.

Given Kapāpala's geographic location, there are several recorded *mo 'olelo* that tells of Pele's interaction with this area. Handy et al. (1991) mentioned that on the bare plains of Kapāpala stood a solitary *kukui* (*Aleurites mollucana*) tree, which is said to have been a place where Pele rested. This lone *kukui* tree was reportedly observed by Handy et al. (1991:231) in 1935 "but it looked very old and feeble." In addition to this obscure reference, the following paragraphs contain summaries of other *mo 'olelo* that feature Pele as well other chiefs and chiefesses.

Ke Kaua Nui Weliweli Ma Waena o Pele a me Waka

Between May through December of 1899, Hawaiian literary author Moses Manu published *He Moolelo Kaao Hawaii no ke Kaua Nui Weliweli ma Waena o Pelekeahiloa a me Wakakeakaikawai* (a Traditional Hawaiian Account Regarding The Ferocious Battle Between Pelekeahiloa And Wakakeakaikawai) in the Hawaiian language newspaper *Ka Loea Kalaaina* (Manu 1899). As the title suggests, the *mo 'olelo* recounts the battle between the fire deity Pele-ke-ahi-loa (Pele the long flame, an epithet for Pele) and the *mo 'o wahine* (female reptilian-water deity) Waka-ke-aka-i-ka-wai (Waka the reflection in the water, an epithet for Waka). Although Manu named the *mo 'olelo* after this battle, the *mo 'olelo* also tells of Pele's *mo 'okū 'auhau* (genealogy) and migration to Hawai'i from Tahiti with various family members. Manu also recounts the story of Pele's sister, Kapō'ulakīna'u, who is noted as the first of Pele and her relatives to arrive in Hawai'i and traverse the archipelago in search of a new home. Broadly speaking, the *mo 'olelo* records the physical transformation of the landscape and other places in the *moku* of Ka'ū, Puna, and Hilo from lush forests and white-sand beaches into the volcanic landscape that is seen today. Reference is also made to the lands of Kapāpala and the nearby Punalu'u as the place where the *mo 'o wahine* Waka fled through, in her attempt to escape Pele's fires.

Before delving into this fascinating tale, it is worth providing some context about *mo 'o*, their characteristics, and their significance in Hawaiian culture. According to Brown (2022:3) in her study titled *Ka Po'e Mo'o Akua Hawaiian Reptilian Water Deities*, *mo 'o* "embody the life-giving and death dealing properties of water, the element with which they are associated." Brown adds that:

Mo'o are not ocean dwellers. Instead, they live primarily in or near bodies of fresh water. As a class of deities, they vary greatly in size—as huge as a mountain or as tiny as a house gecko. Many mo'o have alternate forms. Predominately female, those mo'o who masquerade as humans are often described as stunningly beautiful. Tradition holds that when you come across a body of fresh water in a secluded area and everything is eerily still, you should not longer for you have stumbled across the home of a mo'o. When the plants are yellowed and the water covered with a greenish-yellow froth, the mo'o is at home. If so, you should leave quickly lest the mo'o make itself known to you, to your detriment. (Brown 2022:3)

Below is a summary of the *mo 'olelo*, derived from Manu's (1899) original Hawaiian language text, with a focus on the battle, the events that led up to it, and the aftermath. The segment of the *mo 'olelo* summarized here begins at Halema'uma'u, one of the *hale lua* (pit homes) of Pele and her extended family. One day, Pele spotted a white bird encircling her home; it had long tailfeathers and black feathers along its head and wings. After seeing the bird on multiple occasions, she became annoyed and wanted to know more about it. Using her magical powers (*mana kupua nui*) Pele discovered that the bird, a *koa'e* (*Phaeton lepturus*), was half-man. She instructed her younger sister, Hulikapaauianua, to spy on the bird-man, follow him home, and confirm what she saw. Hulikapaauianua did as her sister commanded and followed the bird-man to his home near the sea in Pū'ula, Puna. It was here that Hulikapaauianua confirmed that the bird was indeed half-man—a handsome man named Puna'aikoa'e.

When Hulikapaauianua returned to Kīlauea and informed Pele of what she saw, Pele immediately departed her home without telling her family where she was headed. When she reached Pū'ula, she shapeshifted into a beautiful young woman and offered an arousing chant. Puna'aikoa'e, infatuated with this mysterious woman, invited her into his home and inquired about her identity. Pele revealed who she was and they became lovers. When Pele returned to Halema'uma'u, she told her family of Puna'aikoa'e and made it clear to her younger siblings that he was hers alone. Puna'aikoa'e went to live with Pele, who permitted him to roam freely around Kīlauea except for Pu'u'oni'oni, a place that was reserved for Hi'iakaikapoliopele—Pele's favorite younger sibling. On numerous occasions, and with Pele's permission, Puna'aikoa'e left Halema'uma'u for extended visits with his family in Puna, Hilo, and Ka'ū. Pele and Puna'aiko'ae lived happily with this arrangement for some time.

One day, when Puna'aikoa'e was in 'Ola'a, he saw a beautiful woman like no other in the forest. The next day, he saw her again and introduced himself. The woman was the *mo'o* (reptilian water deity) Wakakeakaikawai (Waka) from O'ahu. It was as if Puna'aikoa'e forgot about Pele, and thus he spent a great deal of time with Waka. Pele knew who Puna'aikoa'e was with, and in respect of Waka, sent her younger sister, Kapuokokaulaokeahi, to retrieve Puna'aikoa'e. When Kapuokokaulaokeahi reached Puna'aikoa'e, she witnessed him and Waka relaxing together and told him to return to Kīlauea per the instructions of her sister. He was reluctant at first, but upon being reminded of Pele's power, he returned with Kapuokokaulaokeahi to Kīlauea. Waka, saddened by Puna'aikoa'e's departure, cried out to him, instructing him that when he saw a spiderweb in front of his face, it would be her. When Puna'aikoa'e reached Kīlauea, Pele told him that she would not be angered by his behavior on this occasion, but in the future, death would be his punishment.

Waka loved Puna'aikoa'e dearly and constantly thought about him. Eventually, she resolved to retrieve him and made her way to Ka'auea, where she released an eight-eyed, white-bellied spider. The spider reached the edge of the cliffs at Uēkahuna and peered into Halema'uma'u, where many men and women were resting. It descended into the crater, found Puna'aikoa'e, and crawled on one of his ears. Startled by the spider's movements, Puna'aikoa'e woke up and noticed a web in front of his nose. Remembering what his lover told him, he realized that the spider was from Waka. Careful not to awaken anyone, Puna'aikoa'e made his way out of Halema'uma'u and to Ka'auea where Waka was waiting. Once they were reunited, they made their way first to Kapulei, then to Kapāpala, then to a cave called Kaualehu in the uplands of Punalu'u, where one of Waka's *mo'o* relatives lived.

In the morning, Pele woke up to find Puna'aikoa'e was no longer with her. Infuriated by his departure, she instructed Kapuokokaulaokeahi to find him and confirm if he was with Waka. Kapuokokaulaokeahi did as she was instructed and eventually found the couple at Kaualehu. When she told Puna'aikoa'e to return with her to Halema'uma'u, Waka refused and sent Kapuokokaulaokeahi back to Pele. Kapunohu, the *mo'o* relative who lived at Kaualehu, warned Waka that her refusal would have terrible consequences. Before departing, Kapuokokaulaokeahi warned Waka and Puna'aikoa'e of the dangers they would soon face. Kapuokokaulaokeahi hastily made her way back to Halema'uma'u and told Pele of everything that transpired. Enraged, Pele met with her family who resolved to support her. This was the beginning of the battle that ensued.

Pele instructed many of her older relatives and younger siblings to stay at Kīlauea, while she took Hi'iakaika'alemoe and Hi'iakaika'ale'i with her. Hi'iakawāwahilani was left to assist their uncle, Lonomakua. The *pele* (lava) made its way underground from Kīlauea to Punalu'u. Three earthquakes occurred because of the movement of lava. Pele then instructed her younger sisters to make the sea rise upon the lands of Punalu'u. As the sea rose, it remained calm like water in a mountain stream and did not cause much destruction to the people living there. The sea rose all the way to the cave of Kaualehu, and as Waka and Puna'aikoa'e saw this, they did not know it was Pele in hot pursuit of them. As the sea quickly receded away from the entrance of her cave, Kapunohu looked out and saw smoke billowing from the sea and uplands. She told Waka and Puna'aikoa'e, "See! You two have brought me danger and conflict due to your behavior. Leave quickly. Pele surrounds us, there is nowhere for you to escape. Think quickly about how you can resolve this."

After responding to Kapunohu, Waka and Puna'aikoa'e exited the cave to fight Pele. Waka began calling to Mo'oinanea and Kihaniulūmoku, respectively the head *mo'o* and guardian of Paliuli. In turn, Mo'oinanea called out CIA for the Kapāpala Koa Canoe Management Area, Kapāpala, Ka'ū, Hawai'i

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to the *mo'o* of Kaua'i to meet above Kalalea. They did as instructed and Mo'oinanea laid out a net made of spiderwebs that she used to transport the *mo'o* to Punalu'u. She then called out to the *mo'o* of O'ahu, Molokai, Maui, and Lāna'i to gather; she used her spiderweb net to transport them all to Punalu'u for the ensuing war. Once in Ka'ū, the land was filled with *mo'o*, and they knew that Pele was near and watching them. Mo'oinanea instructed the *mo'o* to wait before engaging with Pele.

Pele again made the sea rise two more times to the cave where Waka and Puna'aikoa'e were hiding. Once they began to flee, Pele's fires ignited, smoke billowed from the dirt, and burning rocks were hurled at the two lovers. As the other *mo'o* saw this, they knew that there was a reason why Pele was pursuing their *mo'o* relative. When they learned that it was because Waka took Pele's man, they decided that Waka would face the consequences of her actions without their assistance.

Waka and Puna'aikoa'e attempted to flee from Pele and sought aid from *mo'o* living in the mountains above Punalu'u. They rested for a bit when they arrived, only to be forced to flee once more when Pele found them and began to burn the forest. They ran back to Punalu'u, jumped into the sea, and swam to Honu'apo in hopes that Waka's *mo'o* relatives, Ka'ilioalono and Kawelohea, would assist them. Again, Pele thwarted their plans, killing any *mo'o* that dared to disobey Mo'oinanea's orders and assist Waka.

Waka and Puna'aikoa'e eventually made their way to Hīlea and later to Keāiwa. When Pele was near, they both transformed into birds (Waka became an owl and Puna'aikoa'e a *koa'e* bird) and flew away to Pākau. To no avail, Pele was still in hot pursuit, and with all their strength, Waka and Puna'aikoa'e fled to Pānau, then to Kaimū, Kamā'ili, 'Ōpihikao, and numerous other places until they reached Puna'aikoa'e's homeland of Pū'ula. Having no time to rest, they continued to flee to Paliuli, then to Māwae along the coast of Hilo. Finally, at Waiākea pond in the *ahupua'a* of Waiākea, Puna'aikoa'e was killed. Waka continued to flee but was soon forced into a large pond in Keaukaha and killed by Pele. Her body was turned to stone. The pond that Waka was killed in now bears her name. It is a place where 'ōwāwaka (a type of Hawaiian mussel) was abundant in previous times.

It is said by the people of old that this battle is the reason why lava covered most of Puna, Ka'ū, as well as a long stretch of sand from Waiākea, Hilo to Pānau, Puna, known as Ke One Lau'ena a Kāne.

Chief Kapāpala Taunts Pele and Meets Certain Death at Kīlauea

W.D. Westervelt (1916:33-34) in his book *Legends of the Volcanoes* related several tense stories that tell of Pele's interactions with chiefs of Hawai'i Island who sought to compete with the fiery goddess in ancient pastimes such as *hōlua* and surfing. One such account recorded by Westervelt tells of Pele's encounter with a chief named Kapāpala. Having heard of the mystical fire woman, Kapāpala went to the edge of Halema'uma'u to investigate. There he found a group of beautiful women and was welcomed by Pele. They delighted in each other's company and challenged each other in many games and contests. Kapāpala was so victorious in their games and contests that he boasted greatly and told Pele that he could ride his surfboard on her fiery lake. Angered by the chief's daring remarks, Pele became furious at the thought of Kapāpala desecrating her sacred home. In an act of defiance, Kapāpala grabbed his surfboard and threw it down on a wave of molten fire as it encircled the crater wall. The audacious chief proceeded to surf the molten wave and to further show his contempt for Pele, stood on his head and rode the crest of the molten surf. In a fury, Pele called to her fire servants and 'aumākua (family gods) to aid in Kapāpala's destruction. With the help of her fire servants and 'aumākua, they hurled fiery waves across the lake causing the wave that Kapāpala was riding to become distorted. Unable to steady himself on the turbulent wave, at once, Kapāpala was tossed off his board and plugged into the heart of Pele's flaming crater where he perished.

Battle Between Pele and Kamapua'a

Fornander (1918-1919:332-342) in the fifth volume of his series titled *Hawaiian Antiquities and Folk-lore*, recounted one of many battles between Kamapua'a and Pele. In one such battle, Kamapua'a, a half-man, half-hog chief of O'ahu and adversarial lover of Pele, sailed for Hawai'i, landed in Puna, and proceeded to Kīlauea where Pele and her siblings were living. Once at Kīlauea, Kamapua'a stood at 'Akanikōlea, a point of land overlooking the crater that was *kapu* to Pele. While overlooking the crater, Kamapua'a saw Pele's sisters, Hi'iakaikapua'ane'ane and Hi'iakaikapoliopele at the pit of the crater floor stringing *lei*. As Kamapua'a called out in chant to the sisters, Pele overheard his voice but paid him no attention. Kamapua'a again called out, but this time his chant was provocative and nuanced with *kaona* (hidden meanings), in an attempt to entice Pele. Pele responded from the bottom of Halema'uma'u, "Hele ala aku hoi ke kanaka, o ka puua ka la, oia ka mea e ala aku ai." (I would get up if you were a man; but being a hog I will not get up) (Fornander 1918-1919:334-335). Pele's retort prompted Kamapua'a to ask his gods why Pele slighted him and his gods instructed him to chant once more to Pele. Here Kamapua'a uttered the following chant to Pele in which mention is made to the waters of Kapāpala:

*Ia Makalii lau awaawa o Puna,
Hala ka wai mauka o Kapapala,
Lani pili o Hilo—e,
I Hilo, i Puna Kaua e!
E Pele e! ilaila kaua e noho ai,
Kui ana i ka lehua i Hopoe nei la,*
(Fornander 1918-1919:335)

By Makalii the leave of Puna were made bitter,
The waters went above Kapapala,
The heavy rains fell at Hilo,
In Hilo and Puna the rains fell.
O Pele, let us make our abode there,
And string the lehua at Hope.
(Fornander 1918-1919:334)

Pele's sisters urged her to respond to Kamapua'a, who had taken the form of a handsome man. Pele countered her sisters stating that they were indeed mistaken as the man standing at 'Akanikōlea was a pig disguised as a man who was the grandson of Kamaunuaniho and the son of Kahikiula and Hina. The sisters insisted that what they were seeing was a striking man and not a pig. Pele stood fast in her argument and maintained that the man was nothing more than a pig. Kamapua'a called out in chant to Pele several times more but this only incensed the unpredictable fire goddess.

Pele immediately ordered her siblings to stoke the fires and commanded that her two brothers Hi'iakalalo and Hi'iakaluna climb above Kamapua'a. As Pele's brothers approached Kamapua'a, he again asked his gods who these beings were. His gods informed him that if the brothers ever came together, the pig-man would meet certain death. To distract the brothers and avoid his impending doom, Kamapua'a sent his love god, Lonoikeaweawehaloha who cunningly made love to the brothers. Kamapua'a's ploy worked and the brothers completely forgot the commands of their sister Pele. Keenly aware of Kamapua'a's deceitful ruse to bring about trouble, Pele proceeded to take Kamapua'a to the lowlands of Puna in Mālamānui and order Lonomakua and her siblings to again stoke the fires. After Pele and Kamapua'a exchange words, at the command of Pele, Lonomakua and Pele's siblings hurled molten rocks through the sky toward Kamapua'a. The liquid hot rocks reached the breast of Kamapua'a. Pele mistakenly thought he had been consumed by her fires, so she left and returned to her home at Kīlauea where she began to put out her fires. Kamapua'a was, however, surrounded by the powers of his gods Kuiliaikekaua and others which protected him from succumbing to Pele's wrath.

Kamapua'a again appeared at 'Akanikōlea, very much alive. Vexed at the sight of Kamapua'a, Pele ordered that the fires be reignited once more. When Kamapua'a saw the fires, he called to his sister, Keli'iomakahanaloa who appeared in the form of a small cloud. The moisture-laden cloud hovered directly over the pit of Kīlauea and Keli'iomakahanaloa sent torrential rains that extinguished Pele's fires and caused the pit to overflow with water. All that was saved from this rainstorm was Pele's fire-making sticks. Kamapua'a in his hog form descended into the pit of Kīlauea until the whole place became overrun with hogs. Kamapua'a then opened his jaws, wielded his tusk, and swallowed all of Halema'uma'u including Pele and her family where they descended into the depths of the pig's belly until they were nearly dead. Kamapua'a's fickle love god, Lonoikeaweawehaloha saw this scene and decided to end this horrific event so he put compassion in Kamapua'a's heart which saved Pele and her family from their deaths.

Kamapua'a, at once, ascended the crater cliff to 'Akanikōlea but Pele not willing to back down to the pig deity, ordered Lonomakua to stoke the fires once more. Using the fire-making sticks that were spared from the flood, Lonomakua rubbed them together until the fire in Kīlauea was rekindled and it overflowed the crater rim. At last, the fires reached the haughty Kamapua'a at which point he called for his various supernatural body forms including the *olomea*, *hala*, *uhaloa*, and *'ama 'uma 'u* to grow with great vigor which shut off Pele's fires. The battle lasted many days until finally, the two adversarial lovers came together and agreed to divide the island of Hawai'i into Pele and Kamapua'a respective territories. Pele took the districts of Puna, Ka'ū, and Kona—lands known for their volcanic and rocky nature—and Kamapua'a took for himself, the districts of Kohala, Hāmākua, and Hilo—lands celebrated for their lush greenery. Thus the complex love saga between Kamapua'a and Pele ended.

Story of Nānaele

In their collaborative book, *Folktales of Hawai'i*, (Pukui and Green 1995:77-79) related the account of Nānaele, a comely high chiefess of Ka'ālāiki, Ka'ū who escaped from her negligent husband Nāliko, a young chief of Kohala. One day, a company of travelers from Kohala visited Ka'ū and saw the kind and fair Nānaele. The travelers coveted the chiefess as a wife for their chief, Nāliko. A proposition was made to Nānaele and she consented after hearing that Nāliko was "a pleasant man, handsome, modest, and industrious, with other good qualities" (Pukui and Green 1995:77). Nāliko agreed to take Nānaele as his wife and a short time later the two were married at Ka'ālāiki, and the pair returned to Kohala to live out their life as husband and wife.

Nānaele soon learned that her husband was not faithful and he often neglected her as he amused himself in *hula* and in the company of Kohala's young women. Unable to leave, Nānaele hoped that she could win his affection but Nāliko paid her no attention and left her without food. The body of the Ka'ū chiefess began to waste "away until she was nothing but bone" (Pukui and Green 1995:77). One day Nānaele approached her husband and pleaded with him to return home

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and attend to her, however, Nāliko disregarded her concerns and returned to his pleasurable and neglectful ways. After her husband left, Nānæle crept out of the house in search of food. In a weakened state, the chiefess crawled along until she collapsed at the home of some farmers who were raising pigs. A passerby hearing the commotion from the pigs walked over to investigate and found the exhausted Nānæle laid out on the ground. The passerby picked up Nānæle and carried her back to his home where she was cared for by his wife.

By the time Nānæle began to recover from her feeble state, word had reached Ka‘ū about the chiefess’s poor condition. The people of Ka‘ū, with heavy hearts, decided to fetch their chiefess and bring her back home. People from Ka‘alāiki, Kawā, Kahuku, and as far as Kona and Kohala lent their assistance to retrieve the stricken chiefess. Two people carrying a *mānale* (palanquin) marched to the home where Nānæle was staying. Placing her on the *mānale*, the two individuals carried her some distance to a place where other men were stationed to relieve the weary bearers. She was taken by relay until Nānæle reached her home of Ka‘alāiki. Here, with the help of her people, Nānæle made a full recovery and she once again became sought after by many suitors.

Having heard of the improved condition of Nānæle, Nāliko planned to return to Ka‘alāiki to get his wife back. News of Nāliko’s plan had reached Ka‘ū and the people prepared to protect Nānæle from returning to Kohala. Perceiving Nāliko’s plan, the people of Ka‘alāiki reported to Nānæle’s parents their scheme to hide the chiefess from the careless Nāliko. The people took Nānæle and concealed her at Kawā. Meanwhile, a carefully planned feast was prepared at Ka‘alāiki in anticipation of Nāliko’s arrival. As expected, Nāliko arrived at Ka‘alāiki and was greeted by his in-laws who informed him that Nānæle and her attendants had gone bathing in the sea but would return later in the evening. In the meantime, Nāliko was entertained with chant, dance, and drinks that put the unpleasant chief into a tranquil state. The men of Ka‘alāiki had planned, under the cover of darkness, to slay the awful chief but an old man pitied the chief and whispered to Nāliko:

They mean to kill you! Here! Delay is perilous! I will guide you to a place where you can hide. Come with me! (Pukui and Green 1995:79)

When the people of Ka‘alāiki were preoccupied, Nāliko and the old man fled through an underground cave until they “reached a spot back of the Kapāpala stock ranch where they ran along between the mountains Hualālai and Maunaloa” until Nāliko escaped back to his home district of Kohala. To avoid suspicion, the old man returned to Ka‘ū and found the people searching the countryside between Kahuku to the crater at Kīlauea. The old man discreetly joined the search party and watched as the people futilely searched for Nāliko.

Having returned to Kohala, Nāliko knew he would never again see Nānæle, and had it not been for the old man, he would have been killed. The chiefess of Ka‘alāiki lived out the rest of her life in peace with her parents and her people.

KA‘Ū ALI‘I FROM THE PRECONTACT TO EARLY HISTORIC PERIOD

Aside from the *mo‘olelo* (presented above) regarding the chief Kapāpala and his ill-fated encounter with Pele, the historical records associating Ka‘ū’s chiefly lineage to the lands of Kapāpala are relatively silent. However, from the writings of Kamakau and others, we can construct a generalized chronology of those *ali‘i* (chiefs) that ruled the Ka‘ū District. Kamakau (1991:101-102) asserts that “the chiefs of Hawai‘i island were from Maui and from O‘ahu and Moloka‘i between the times of ‘Aikanaka and Hanala‘a-nui” and that “[t]here were seventeen generations during which Hawai‘i island was without chiefs—some eight hundred years.” Kamakau (1991) adds that the *po‘e ali‘i* or chiefly people residing on Hawai‘i Island during this time were Punalu‘u, Hīlea, Honomalino, Hīkapoloa, and several other unnamed individuals. Kamakau suggests that the lack of chiefs on Hawai‘i Island is the reason Pili (also known as Pilika‘aiea), a chief from Kahiki was brought by the high priest Pā‘ao to Hawai‘i. Although Kamakau associated these names with ruling chiefs, the names of some of these chiefs have been preserved and remembered as *ahupua‘a* names, two of which (Punalu‘u and Hīlea Ahupua‘a) are within eastern Ka‘ū.

The Reign of ‘Umi a Līloa to Keawenuia‘umi

‘Umi a Līloa, a renowned *ali‘i* of the Pili line, is often credited with uniting the Island of Hawai‘i under one rule sometime during the 1600s (Cordy 2000; Kamakau 1992). ‘Īmaikalani, who was a powerful warrior and chief from Ka‘ū, resisted ‘Umi, but failed to defeat him in his younger days. Combat between the two *ali‘i* occurred over an extended period, however, when ‘Īmaikalani became blind in his old age, he maintained his reputation for strength and skill in battle. Of ‘Īmaikalani, Kamakau (1992:18) related the following:

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, flashed like lightning, and rumbled like an earthquake. When he struck behind him, a cloud of dust rose skyward as though in a whirlwind. ‘Umi-a-Līloa 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.

It was only through the skill and cunning prowess of ‘Umi’s lifelong friend, Pi‘imaiwa‘a, that ‘Īmaikalani was finally defeated. Pi‘imaiwa‘a studied ‘Īmaikalani until he became knowledgeable of the Ka‘ū chief’s strength and marvelous skill, and then he killed the two men who led ‘Īmaikalani on either side, the forty men who carried his spears, and all of his pet ducks. When ‘Īmaikalani was alone and helpless, Pi‘imaiwa‘a killed him and Ka‘ū became ‘Umi a Līloa’s (Kamakau 1992). ‘Umi a Līloa with the aid of his generals, Pi‘imaiwa‘a, ‘Ōma‘okāmau, and Kōī went on to conquer all of the district chiefs of Hawai‘i Island, where ‘Umi then divided the land amongst his chiefs and gave Ka‘ū to ‘Ōma‘okāmau (Fornander 1916-1917).

Succeeding ‘Umi a Līloa was his eldest son Keli‘iokāloa. Little is known of Keli‘iokāloa’s reign, however, Fornander (1880:111) writes that after his death “there supervened a season of internal war, anarchy, and confusion” which was likely the result of the district chiefs’ refusal to acknowledge Keli‘iokāloa’s brother, Keawenuia‘umi as the sovereign. There appear to be conflicting ideas of who the rightful sovereign was which led to two potential heirs competing for the kingdom, Keawenuia‘umi and Kūka‘ilani, Keli‘iokāloa’s son (Cordy 2000; Fornander 1880). At the time of this conflict, the ruling chief of Ka‘ū was Kahalemilo, the son of ‘Īmaikalani (Fornander 1916-1917). Kahalemilo and the other district chiefs of Hawai‘i Island were eventually slain by Keawenuia‘umi.

Keawenuia‘umi and the Rise of the ‘Ī Chiefs

After slaying all of the chiefs of Hawai‘i Island, Keawenuia‘umi turned his attention to consolidating his power by appointing a new line of district chiefs. He named his half-brother, Kumalaenui a ‘Umi (Kumalae) as the new chief of Hilo, which eventually resulted in the outward expansion of the ‘Ī line of Ka‘ū chiefs into Hilo. Keawenuia‘umi later married off one of his daughters from Kamolanui-a-‘umi to Makua, the son of Kumalae. Born from this union was a daughter who became the mother of the ruling chief ‘Ī. The descendants of ‘Ī went on to rule over Hilo for many generations and subsequently expanded their territory to include portions of Hāmākua, Puna, and Ka‘ū districts (Cordy 2000). Pukui (1983:141) recorded the following ‘ōlelo no ‘eau “Ka hālau a ‘Ī” (the house of ‘Ī) which commemorates the political expansion of the ‘Ī line throughout the east Hawai‘i districts.

From the ‘Ī genealogy descended a long line of powerful rulers, many of whom ruled from Ka‘ū including the high chiefess, Lonomā‘aikanaka, her son Kalaninui‘tamamao and his son Kalani‘ōpu‘u, and his son, Keōuakū‘ahu‘ula (McKinzie 1983). Edith Kawelohea McKinzie in her book *Hawaiian Genealogies Volume I* cites a chiefly genealogy chant that was published in the July 20, 1896 edition of the Hawaiian language newspaper, *Ka Maka ‘āinana*. This chant detailed the genealogy from Lonomā‘aikanaka down to her great-grandson, Keōuakū‘ahu‘ula who would be the last standing district chief to battle against Kamehameha. That portion of the chant is recited below along with a translation provided by the lead author of this study:

<ol style="list-style-type: none"> 1. Keaweikekahialiiokamoku k noho ia Lonomāaikanaka w, loaa o Kalaninuiiamamao k. 2. Kalaninuiiamamao k noho ia Kamakaimoku w, loaa Kalaniopuu k. 3. Kalaniopuu k noho ia Kanekapolei w, loaa o Keoua Kuahuula k a me Pauli Kaoleioku k. (McKinzie 1983:40) 	<ol style="list-style-type: none"> 1. Keaweikekahialiiokamoku (male) dwelled with Lonomāaikanaka (female), born was Kalaninuiiamamao (male). 2. Kalaninuiiamamao (male) dwelled with Kamakaimoku (female), born was Kalaniopuu (male). 3. Kalaniopuu (male) dwelled with Kanekapolei (female), born were Keoua Kuahuula (male) and Pauli Kaoleioku (male).
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Another of ‘Umi’s descendants to have ruled Ka‘ū was the *ali‘i wahine* (chiefess) Keakealaniwahine, who amongst other things, is remembered for conducting religious ceremonies at various *heiau* (temples) around Hawai‘i Island including Punalu‘u, southeast of the project area. As the story is told, during one of her circuits, she was accompanied by the chief ‘Ī and his son, Kua‘ana-a-‘Ī, both of whom were descendants of ‘Umi a Līloa. During this circuit, ‘Ī died, and to prevent defilement and as custom dictated, Kua‘ana-a-‘Ī departed and left Keakealaniwahine alone to complete the ceremonies. Keakealaniwahine construed this as an act of revolt and attempted to kill Kua‘ana-a-‘Ī. Kua‘ana-a-‘Ī and his followers captured Keakealaniwahine and banished her to Moloka‘i for two years, during which time he and his son, Kuahu‘ia, ruled the island. After her time on Moloka‘i, Keakealaniwahine returned to Hawai‘i Island and Kua‘ana-a-‘Ī placed Ka‘ū, Kona, and Kohala under her control (Cordy 2000).

The Reign of Lonoikamakahiki down to Kīwala‘ō and Kamehameha

In a portion of the *Legend of Pupukea* recorded by Fornander (1918-1919:436-451), he recounts the events that led up to a war between the chiefs of Maui and Hawai‘i Island. Although this war was centered primarily in the Waimea-South Kohala region of Hawai‘i Island, a portion of this story tells of the rallying of the troops from the various districts of Hawai‘i. At the center of this epic war were two brothers, Lonoikamakahiki and his junior, Pupukea, who were from Hawai‘i Island. Leading the Maui forces in this battle were Kamalālāwalu and his distinguished warrior, Makakūikalani. Lonoikamakahiki was a celebrated ruling chief of Hawai‘i Island with lineal ties to the ancient Pili dynasty (a Hawai‘i Island lineage with ties to Waipi‘o Valley) since roughly A.D. 1300. He was the son of Keawenui a ‘Umi, the grandson of ‘Umi a Līloa, and recognized as an accomplished and dexterous warrior.

Upon the advice of two of Lonoikamakahiki’s allies who had infiltrated the Maui army, Kūmaikeau and Kūmaikaia, Kamalālāwalu arrived at Pu‘u Hōkū‘ula in Waimea only to find the *pu‘u* (hill) bare of any vegetation or rocks—resources that he was told would help in his victory over the Hawai‘i Island chief. As Kamalālāwalu conversed with Kūmaikeau and Kūmaikaia in Waimea, messengers were sent to summon Lonoikamakahiki who was residing at Kealakekua, Kona and Pupukea who was living at Kapāpala, Ka‘ū:

When the messenger appeared before him [Lonoikamakahiki], he said to Lonoikamakahiki: “Kamalalawalu and Makakuikalani have come to give battle to you both; and have contended with Kanaloaua, who is a captive of Kamalalawalu.”

When Lonoikamakahiki heard these things, he questioned the messenger: “Where is the battle to take place?” The messenger replied: “There at Waimea, on top of that hill, Hokuula, where Kamalalawalu and all Maui are stationed.” Upon Lonoikamakahiki hearing this, instantly the overseers went forth to muster all the men of Kona. It is said that there were 32,000 men of Kona at that time. From thence the messenger traveled till he arrived at Kapapala, in Kau, where Pupukea was residing. When he heard [the tidings], he gathered together Kau, and marched forth between Maunakea and Hualalai. The herald journeyed on and touch Puna, at Hilo, and Hamakua, to gather the people together at Kohala, and hearing, they came. At this sallying forth, there were very many men, the paths being overcrowded and the dust rising on account of the tread of the soldiers. (Fornander 1918-1919:446)

According to this *mo‘olelo*, the soldiers from the districts of Hawai‘i Island marched to Waimea using four main routes. Thirty-two thousand soldiers from Kona traveled from Kanikū; 112,000 contingents from Ka‘ū traveled from ‘Ōhaikea, a land area in Kapāpala, through the saddle of Mauna Kea and Hualālai; 160,000 men from Puna, Hilo, and Hāmakua traveled from Mahiki (a forested section of Waimea); and another 96,000 combatants marched from Kaholeiwai to Moumoualoa. As the battle ensued, Kamalālāwalu quickly realized that his army was vastly outnumbered. Instead of a full-fledged battle, Lonoikamakahiki and Kamalālāwaly resolved that Pupukea and Makakūikalani would stand first to fight to determine the outcome of the war. Pupukea delivered two swift blows with his spear and Makakūikalani fell to his death. Upon the death of Makakūikalani, the Maui forces retreated to the coast in an attempted escape but they were quickly overwhelmed and slaughtered.

The lands of Ka‘ū and Kapāpala figure more prominently in the decades preceding and throughout the reign of Keōuakū‘ahu‘ula and Kamehameha. It was also during this period that the first Westerners set their sights on Hawai‘i in the year 1778, thus marking the end of Hawai‘i’s Precontact Period and the beginning of the early Historic Period. 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 (Beaglehole 1967). The following January (1779), during a return trip to the islands, Cook and his men visited the southern tip of Hawai‘i Island where they described a large village on the point (Ka Lae) and met with the inhabitants who brought supplies to their ship. No detailed observations were made by Cook or his men of the Kapāpala area, however, Captain James King, who accompanied Cook on the voyage noted the Ka‘ū District, despite its desolate appearance, seemed more populous than the neighboring district of Puna. Kelly (1969) estimated the population of Ka‘ū to be anywhere between 10,000 and 13,500 at the time of European contact. King provided the following description of Ka‘ū:

It is not only by far the worst part of the Island but as barren waste looking a country as can be conceived to exist...we could discern black streaks coming from the Mountain even down to the Seaside. But the [southern] neck seems to have undergone a total change from the Effect of Volcanoes, Earthquakes, etc...By the SE side were black honey combed rocks, near the [southern] extremity, which projects out, has upon it rocks of the most Craggy appearance, lying very irregularly, & of most curious shapes, terminating in Sharp points; horrid & dismal as this part of the Island appears, yet there are many Villages interspersed, & it struck as being more populous than the part of Opoona [Puna] which joins Koa [Ka‘ū]. There are houses built even on the ruins [lava flows] we have

describ'd. Fishing is a principal occupation with the Inhabitants, which they sold to us, & we also had a very plentiful supply of other food when off this end. (Beaglehole 1967:606-607)

After leaving South Point, Cook anchored near Ka‘awaloa at Kealakekua Bay in the South Kona District on January 17th to resupply his ships. This trip occurred at the time of the annual *Makahiki* festival, where many chiefs and commoners were gathered around the bay. According to John Ledyard, a British marine on board Cook’s ship, upward of 15,000 inhabitants were present at the bay, and as many as 3,000 canoes came out to greet the ships (Jarves 1847:59). On January 26th Kalani‘ōpu‘u, the reigning chief of Hawai‘i Island, and former district chief of Ka‘ū visited Cook on board the *H.M.S. Resolution*, where they exchanged gifts. Kamehameha was also present at this meeting (Jarves 1847).

On February 4th, Cook set sail from Kealakekua Bay, but a storm off the Kohala coast damaged the mast of the *H.M.S. Resolution*, and both ships were forced to return to Kealakekua to make repairs. On February 13th, several natives were discovered stealing nails from the British ships. They were fired upon by the crew, and a chief close to Kalani‘ōpu‘u named Palea was knocked down, and his canoe taken. That night one of Cook’s boats was stolen, and the following morning Cook set ashore at Ka‘awaloa with six marines to ask Kalani‘ōpu‘u for its return. Kalani‘ōpu‘u, however, denied any knowledge of the theft and Cook decided to hold the chief captive until the boat was returned (Kamakau 1992). When Cook tried to seize Kalani‘ōpu‘u, a scuffle ensued and Cook was killed (along with four of his men and several natives) there on the shores of Ka‘awaloa. When Captain Cook fell, the British ships fired cannons into the crowd at the shore and several more natives were killed. Kalani‘ōpu‘u and his retinue retreated inland, bringing the body of Cook with them.

After the departure of the *H.M.S. Resolution* and *Discovery* around 1880, Kalani‘ōpu‘u proclaimed his son Kīwala‘ō successor of his kingdom and gave custody of the war god Kūka‘ilimoku to his nephew Kamehameha (Fornander 1996; Kamakau 1992). Kamehameha had been raised with Kīwala‘ō in Ka‘ū for a period of time during his childhood (Ii 1993). In accordance with the wishes of his father, Keōua (the younger brother of Kalani‘ōpu‘u), following the death of his mother, Kamehameha was brought to Ka‘ū by Kalani‘ōpu‘u. According to ‘Ī‘ī:

...Upon their arrival in Kau, Kalaniopuu placed Kamehameha with his wife, the chiefess Kaneikapolei, who put Kamehameha in the hands of her *kaikunane* relatives, Inaina *ma*. He was there for some time and was familiar with the life of the court by the time he became associated with his older cousin, Kiwalao, the son of Kalaniopuu and Kalola. (Ii 1993:6)

In 1781, a rebel Puna chief named ‘Imakakoloa led an uprising against Kalani‘ōpu‘u. It is said that this rebellion was sparked because ‘Imakakoloa grew tired of the incessant and exorbitant demands of Kalani‘ōpu‘u. ‘Imakakoloa, though a worthy opponent, was no match for Kalani‘ōpu‘u’s superior forces, and was soon defeated. Following the defeat, ‘Imakakoloa managed to avoid capture and hid from detection for the better part of a year. While the rebel chief was sought, Kalani‘ōpu‘u “went to Ka‘ū and stayed first at Punalu‘u, then at Wai‘ōhinu, then at Kama‘oa in the southern part of Ka‘ū, and erected a heiau called Pakini, or Halauwailua, near Kama‘oa” (Kamakau 1992:108). ‘Imakakoloa was eventually captured and brought to Pakini Heiau, where Kīwala‘ō was to sacrifice him as an offering. “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 1969:202). However, before Kīwala‘ō could finish the first offerings, Kamehameha, “grasped the body of ‘Imakakoloa 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 Kīwala‘ō’s authority with a sacrificial ritual in Ka‘ū, Kamehameha retreated to his home district of Kohala.

The Era of Keōuakū‘ahu‘ula and Kamehameha I (1782-1819)

After Kalani‘ōpu‘u’s death in April of 1782, several chiefs were unhappy with Kīwala‘ō’s division of the island, and civil war broke out. Kīwala‘ō—Kalani‘ōpu‘u’s son and appointed heir—was killed in the battle of Moku‘ōhai, South Kona in July of 1782. Supporters of Kīwala‘ō, including his half-brother Keōuakū‘ahu‘ula (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 ‘Ī‘ī (Ii 1993) nearly ten years of almost continuous warfare followed the death of Kīwala‘ō, as Kamehameha endeavored to unite the island of Hawai‘i under one rule and conquer the islands of Maui and O‘ahu. Keōua, the chief of Ka‘ū became Kamehameha’s main rival on the island of Hawai‘i, and he proved difficult to defeat (Kamakau 1992). Keawemauhili, after a battle with Kamehameha’s forces, eventually gave his support to Kamehameha, but Keōua and the people of Ka‘ū never stopped resisting.

Stephen Desha in his book *Kamehameha and his Warrior Kekūhaupi‘o* tells of the historic battle named Kaua Kaua‘awa (Battle of the Bitter Rain) that started in Hilo but was eventually routed to several places within Kapāpala. This battle which was fought between the forces of Kamehameha, Keawemauhili, and Keōua began with Kamehameha’s

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invasion of Keawemauhili's army in Hilo. While Kamehameha's forces were engaged in battle on the shores of Hilo, Keōua assembled his Pōniu army to follow rapidly after Kamehameha's warriors in Hilo. Kamehameha had, however, stationed a secondary army led by Ka‘iana above Kainaliu to bar Keōua's warriors from attacking Kamehameha's Hilo army from the rear. When Keōua's Pōniu army met Kamehameha's forces in the uplands of Kainaliu, a hot battle ensued and Keōua's men were forced back. When Keōua heard of this retreat, he ordered another band of warriors known as the Pūkeawe to charge the men led by Ka‘iana. Together Keōua's Pūkeawe and Pōniu armies outnumbered Ka‘iana's men. To escape grave danger, Ka‘iana's forces retreated to ‘Ainapō to reassemble and call for additional reinforcement from South Kona. With the extra forces that numbered about 2,000, Ka‘iana pursued Keōua's men and the battle moved from ‘Ainapō to ‘Ōhaikoa, a high point of land with view planes to the ocean, and then to Kahauloa, and from that place to Keōmuku and Kapāpala (Desha 2000). In detailing the remainder of this battle, Desha added:

Bitter rain and biting cold fell on both sides, causing obscurity and aiding Keōua's warriors in their escape from being slaughtered by the forces led by Ka‘iana. The people of Ka‘ū were familiar with their land and the pits and hidden caves, so that they saved themselves by flight from Kamehameha's fearless men, led by that accomplished *ali‘i* of Kaua‘i [Ka‘iana]. The people of old, in speaking of this battle, said that Keōua's side only escaped by being covered by that bitter rain so that they disappeared from the sight of their opponents. The reason, also, for this kind of rain being called ‘awa was, that in a state of intoxication with ‘awa, a similar mist would descend and obscure a man's mind, and he would topple over. Thus this rain of the mountain became an ‘awa rain. (Desha 2000:182)

Although neither side was victorious, both armies eventually retreated but they continued to periodically wage war on each other. The near-constant warring on the island of Hawai‘i following the death of Kīwala‘ō undoubtedly affected the people in Keōua's home district of Ka‘ū. Westervelt (1916) related the story of Keōua, Keawemauhili, and Kamehameha that began after the battle of Moku‘ōhai, but tells of another 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 his home district via Kapāpala a portion of his army and accompanying family members were killed by the historic eruption remembered by Hawaiians as Keonehelelei (the falling sands) emanating from Kīlauea (Moniz Nakamura 2003). Westervelt writes:

... Kiwalao's half-brother Keoua escaped to his district Ka-u, on the southwestern side of the island. His uncle Keawe-mau-hili escaped to his district Hilo on the southeastern side.

For some years the three factions practically let each other alone, although there was desultory fighting. Then the high chief of Hilo accepted Kamehameha as his king and sent his sons to aid Kamehameha in conquering the island Maui.

Keoua was angry with his uncle Keawe-mau-hili. He attacked Hilo, killed his uncle and ravaged Kamehameha's lands along the northeastern side of the island.

Kamehameha quickly returned from Maui and made an immediate attack on his enemy, who had taken possession of a fertile highland plain called Waimea. From this method of forcing unexpected battle came the Hawaiian saying, “The spear seeks Waimea like the wind.”

Keoua was defeated and driven through forests along the eastern side of Mauna Kea (The white mountain) to Hilo. Then Kamehameha sent warriors around the western side of the island to attack Keoua's home district. Meanwhile, after a sea fight in which he defeated the chiefs of the islands Maui and Oahu, he set his people to building a great temple chiefly for his war-god Ka-ili [Kūkā‘ilimoku]. This was the last noted temple built on all the islands.

Keoua heard of the attack on his home, therefore he gave the fish-ponds and fertile lands of Hilo to some of his chiefs and hastened to cross the island with his army by way of a path near the volcano Kīlauea. He divided his warriors into three parties, taking charge of the first in person. They passed the crater at a time of great volcanic activity. A native writer, probably Kamakau, in the native newspaper *Kuokoa*, 1867, describes the destruction of the central part of this army by an awful explosion from Kīlauea. (Westervelt 1916:139-140)

He said: “Thus was it done. Sand, ashes, and stones threw up from the pit into a very high column of fire, standing straight up...When this column became great it blew all to pieces into sand and ashes and great stones, which for some days continued to fall around the sides of Kīlauea. Men, women, and children were killed. (Westervelt 1916:141)

Dibble, the first among the missionaries to prepare a history of the islands, gave the following description of the event:

“Keoua’s path led by the great volcano of Kilauea. There encamped. In the night a terrific eruption took place, throwing out flame, cinders, and even heavy stones to a great distance and accompanied from above with intense lightning and heavy thunder. In the morning Keoua and his companions were afraid to proceed and spent the day in trying to appease the goddess of the volcano, whom they supposed they had offended the day before by rolling stones into the crater. But on the second night and on the third night also there were similar eruptions. On the third day they ventured to proceed on their way, but had not advanced far before a terrible and destructive eruption than any before took place; an account of which, taken from the lips of those who were part of the company and present in the scene, may not be an unwelcomed digression.

‘The army of Keoua set out on their way in three different companies. The company in advance had not proceed far before the ground began to shake and rock beneath their feet and it became quite impossible to stand. Soon a dense cloud of darkness was seen to rise out of the crater, and almost at the same instant the electrical effect upon the air was so great that the thunder began to roar in the heavens and the lightning to flash. It continued to ascend and spread abroad until the whole region was enveloped and the light of day was entirely excluded. The darkness was the more terrific, being made visible by an awful glare from streams of red and blue light variously combined that issued from the pit below, and being lit up at intervals by the intense flashes of lightning from above. Soon followed an immense volume of sand and cinders which were thrown in high heaven and came down in a destructive shower for many miles around. Some few persons of the forward company were burned to death by the sand and cinders and others were seriously injured. All experienced a suffocating sensation upon the lungs and hastened on with all possible speed.

‘The rear body, which was nearest the volcano at the time of the eruption, seemed to suffer the least injury, and after the earthquake and shower of sand had passed over, hastened forward to escape the dangers which threatened them, and rejoicing in mutual congratulations that they had been preserved in the midst of such imminent peril.

‘But what was their surprise and consternation when, on coming up with their comrades of the centre party, they discovered them all to have become corpses. Some were lying down, and others sitting upright clasping with dying grasp their wives and children and joining noses (their form of expressing affection) as in the act of taking a final leave. So much like life they looked that they at first supposed them merely at rest, and it was not until they had come up to them and handled them that they could detect their mistake. Of the whole party, including women and children, not one of them survived to relate the catastrophe that had befallen their comrades. The only living being they found was a solitary hog, in company with one of the families which had been so suddenly bereft of life. In those perilous circumstances, the surviving party did not even stay to bewail their fate, but, leaving their deceased companions as they found them, hurried on and overtook the company in advance at the place of their encampment.’

“Keoua and his followers, of whom the narrator of this scene were a part, retreated in the direction they had come. On their return, they found their deceased friends as they had left them, entire and exhibiting no other marks of decay than a sunken hollowness in their eyes; the rest of their bodies was in a state of nature preservation. They were never buried, and their bones lay bleaching in the sun and rain for many years.”

A blast of sulphurous gas, a shower of heated embers, or a volume of heated steam would sufficiently account for this sudden death. Some of the narrators who saw the corpses affirm that, though in no place deeply burnt, yet they were thoroughly scorched.”

Keoua’s prophets ascribed this blow from the gods to their high chief’s dislike of Hilo and gift to sub-chiefs of the fish-ponds, which were considered the favorite food-producers for offerings to Hiiaka, the youngest member of the Pele family.

Kamehameha’s prophets said that this eruption was the favor of the gods on his temple building.

The people said it was proof that Pele had taken Kamehameha under her special protection and would always watch over his interest and make him the chief ruler. (Westervelt 1916: 141-145)

The untimely eruption of Kīlauea, as Keōua’s army attempted to return to Ka‘ū to stop Kamehameha’s warriors from ravaging their home district cost him about four hundred fighting men along with an untold number of women and children. Kamehameha’s prophets said that this eruption was the favor of the gods who rejoiced at his building of Pu‘ukohola Heiau in Kawaihae, which was constructed around 1790 as part of Kamehameha’s efforts to secure his rule

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over Hawai‘i Island (Fornander 1969). Although a portion of Keōua’s forces was killed during this eruption, Keōua made it safely to his royal center which was at Punalu‘u (Kamakau 1992). Despite the loss of men, Keōua continued to resist Kamehameha. In 1791 Kamehameha’s forces, under the leadership of Ka‘iana attacked Keōua’s forces in Ka‘ū. Fornander (1996:326–327) recounted the battle thusly:

The war with *Keoua* was vigorously continued by *Kamehameha* during the year 1791. One army corps under command of *Keeaumoku*, to which John Young and Isaac Davis were attached, operated against Hilo, while another corps under *Kaiana-a-Ahaua* was sent against Kau. Though sorely pressed on both sides, yet *Keoua* bravely kept his ground during the spring and summer of that year, and no decisive advantages were gained by *Kamehameha* in any of the battles fought. The prolonged contest, however, began to tell upon the resources of *Keoua*, yet with consummate tact and bravery he showed a bold and ready front to every attack, from whatsoever quarter aimed.

No reminiscences of the operations against Hilo have survived, but of the campaign in Kau some notices have been collected by the native historians. Supported by a fleet of war canoes hovering about the South Cape (“Lae a Kalaeloa”) of Hawaii, *Kaiana* fought several engagements with *Keoua* at Paiahaa, at Kamaoa, and at Naohulelua, but they were what may be called drawn battles, *Kaiana* sometimes remaining master of the field, and sometimes being obliged to fall back on his flotilla for support. During one of the intermissions in this martial game *Keoua*, suddenly changed his ground from Kau to Puna. *Kaiana* looked upon this move as a confession of weakness, followed *Keoua*, into Puna, and with jubilant exultation anticipated an easy victory. At a place called Puuakoki the two forces met, and *Kaiana* was so severely handled by *Keoua*, and by his generals, *Kaieiea* and *Uhai*, that he made a precipitate retreat out of Puna and returned with his men to Kona, reporting his ill success to *Kamehameha*.

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 warriors of his guard” (Kamakau 1992:155). When Pu‘ukohola Heiau was completed in the summer of 1791, Kamehameha sent his two counselors, Keaweheulu and Kamanawa, to deceitfully entice Keōua to Kawaihae. The counselors arrived at Keōua’s compound and gave their speech but Keōua’s men (Ka‘ie‘iea and Uhāi) were skeptical and attempted to persuade Keōua to kill the two counselors:

Keoua’s people nodded at each other, and Ka‘ie‘iea said to Keōua, “It will be a good thing to kill these counselors of Kamehameha.” Keoua answered, “They must not be killed for they are younger brothers of my father.” Ka‘ie‘ie went on, “If these are killed he will have but two counselors left, and the government will become yours.” “I can not kill my uncles.” The two messengers rolled along in the dirt until they came to the place where Keoua was sitting, when they grasped his feet and wept. When the weeping was over Keoua asked, “What is your errand?” Keawe-a-heulu answered, “We have come to fetch you, the son of our lord’s older brother, and to take you with us to Kona to meet your younger cousin, and you two to be our chiefs and we go to be your uncles. So then let war cease between you.” “I consent to go with you to Kona,” answered Keoua. (Kamakau 1992:155)

After agreeing to go to Kawaihae, Keōua sailed via canoe while his men traveled on foot over the mountain. Keōua sailed along the Kona coast, stopping at different locales including Honomalino, Ka‘awaloa, and Kailua. At each stop, Keōua’s men urged the killing of the counselors to which the chief consistently refused. After leaving Kailua, Keōua sailed to Luahinewai in the Kekaha portion of North Kona. While at Luahinewai, “Keoua went to bathe, and after bathing he cut off the end of his penis (‘omu ‘o), an act which believers in sorcery call “the death of Uli,” and which was a certain sign that he knew he was about to die” (Kamakau 1992:156). Before departing Luahinewai, Keōua arranged his chiefs and officers about him in his double canoe and placed his royal regalia and weapons in the canoe of Keaweheulu as a sign that he knew he would be killed.

Keōua and his men were enticed to the dedication of the Pu‘ukohola Heiau by this ruse and when he neared Pu‘u Kohola, Keōua was killed and sacrificed to complete the dedication of the *heiau* (Kamakau 1992). While the body of Keōua was being carried to the *heiau*, a chief named Kaiheki‘oi uttered the following chant, which is still used “by the old people of Ka‘ū who retain their love of Keoua and hatred for Kamehameha” (Kamakau 1992:158).

Ku‘u haku i ka ua Ha‘ao e,

Ke lele a‘e la ka ua,

Ma uka o ‘Au‘aulele,

Lele ka ua, lele pu no me ka makani.

E lele po‘o and ka wai o ka ha,

Ku‘u haku mai ka wai

My lord of the rain of Ha‘ao,

The rain flies fast,

Flies over the upland of ‘Au‘aulele,

The rain flies driven by the wind.

The rain drives down from the cliffs above,

The tears for my chief

Ha 'ule po 'e e.

Drops down on the heads of the people.

The assassination of Keōua gave Kamehameha undisputed control of Hawai'i Island, however, the people of Ka'ū never acknowledged Kamehameha as their chief (Greene 1993). So beloved and attached to their land and chiefs, the people of Ka'ū continued their unwavering support for Keōua even in the face of grave political conquest. Like the *mele* cited above, this staunch attitude is widely celebrated in many compositions. Once such *mele* (songs) quoted below is a *mele inoa* (name chant) composed for Kupake'ī, who was a descendant of the 'ī line. Kupake'ī along with Keōua reigned during the time of Kamehameha and Kupake'ī would have succeeded Keōua as the district chief had Kamehameha not killed him. In the following *mele*, the Ka'ū chiefs draw upon their knowledge of their lands to counter and demonstrate their disdain towards the intruding political forces of Kona. The following is a portion of the *mele* that was documented and translated by Pukui (1949:251-252).

*'Aole au i makemake ia Kona
O Kau ka'u
O ka wai o Kalae e kahe ana i ka po a 'ao.
I ke kapa, i ka 'upi kekahi wai,
Kulia i lohe ai he 'aina wai 'ole.
I Mana, i Unulau ka wai kali,
I ka pona maka o ka I'a ka wai aloha e,
Aloha i ka wai malama a kane
E hi'i ana ke keiki i ke hokeo,
E hano ana, e kani 'ouo ana,
Ka leo o ka huewai i ka makani,
Me he hano puhi ala i ke aumoe,
Ka hoene lua a ka ipu e o nei.
E lono i kou pomaika'i, Eia!
Mamuli o kou hope 'ole, okoa ka ho'i,
A ma ka wa kamalii nei, mihi malu,
'U wale iho no.
Aloha 'ino no ka ho'i ke kau mamua.
'U'ina 'ino noho'i ke kau i hala aku nei.*

I do not care for Kona,
For Kau is mine.
The water from Kalae is carried all night long.
(Wrung) from tapas and some from sponges.
This land is heard of as having no water,
Except for the water that is waited for at Mana and Unulau,
The much prized water is found in the eye socket of the fish,
The water prized and cared for by the man,
The child carries a gourd container in his arms.
It whistles, whistles as the wind blows into it,
The voice of the water gourd is produced by the wind
Sounding like a nose-flute at midnight,
This long-drawn whistling of the gourd, we hear.
Hearken, how fortunate you are!
There is no going back, (our) ways are different.
In childhood only does one regret in secret,
Grieving alone.
(Look) forward with love for the season ahead of us.
Let pass the season that is gone

By 1796, with the aid of foreign weapons and advisors, Kamehameha conquered all of the island kingdoms except Kaua'i. In 1810, when Kaumuali'i of Kaua'i gave his allegiance to Kamehameha, the Hawaiian Islands were unified under a single leader (Kuykendall and Day 1976). He and his high chiefs participated in foreign trade but continued to enforce the ancient *kapu* system (Kamakau 1992). Kamehameha would go on to rule the islands for another nine years until his passing in 1819 at his home at Kamakahonu, Kailua.

Death of Kamehameha, the Overturning of the 'Aikapu

Kamehameha died in 1819 at his royal residence of Kamakahonu in Kailua, Kona, and his son Liholiho (Kamehameha II) was named heir to the newly consolidated kingdom. Upon his death, Kamehameha's wife, Ka'ahumanu, announced the last *kauoha* (commands) of her late husband:

O heavenly one! I speak to you the commands of your grandfather. Here are the chiefs; here are the people of your ancestors; here are your guns; here are your lands. But we two shall share the rule over the land. Liholiho consented and became ruling chief over the government. (Kamakau 1992:220)

Following the death of a prominent chief, it was customary to lift all the *kapu* that maintained social order and the separation of men and women, as well as elite and commoners. Under the ancient *kapu* of the land, merely naming a chief as heir was only a part of the process. As tradition required, the newly established ruling chief had the arduous task of performing a prescribed set of ancient rituals (referred to as the 'aha ritual) at the *luakini heiau* until the proper signs from the gods, particularly Kū were received (Malo 1951). Successful completion of the complex 'aha ritual was a means to verify that the gods were in favor of and supported the new chief. Immediately upon the death of Kamehameha, Liholiho was sent away to Kawaihae to keep him safe from the impurities at Kamakahonu brought about by the death of his father. Liholiho in his initial unsuccessful attempts to secure the proper signs from the gods, left Kawaihae and circuited Hawai'i Island, visiting several *heiau* of the *luakini* class, including Punalu'u in Punalu'u, southeast of the project area (Ii 1993; Kamakau 1992). After purification ceremonies Liholiho returned to Kamakahonu:

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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-umuali'i consented to the free eating and it was accepted on Kauai. (Kamakau 1992:225)

Liholiho's cousin, Kekuaokalani, caretaker of the war god Kūka'iliimoku, was distressed by the socioreligious turn of events and rebelled. A battle between the forces of Liholiho and Kekuaokalani was fought in December 1819 at Kuamo'o in North Kona. Kekuaokalani's forces were defeated and the old religion fell with them. Liholiho 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, the 'aumākua worship, to continue (Kamakau 1992; Oliver 1961).

EARLY EUROPEAN VISITORS AND MISSIONARY ACCOUNTS

One of the first European explorers to write specifically of Kapāpala was Archibald Menzies, a botanist who made several trips to Hawai'i, first in 1787 and 1788 under Captain Colnett and later in 1792, 1793, and 1794 with Captain Vancouver. The second visitor to pass through Kapāpala was William Ellis who wrote about the area during his 1823 visit.

Archibald Menzies 1794 Trip to Mauna Loa via the 'Ainapō Trail in Kapāpala

On his 1794 trip, Menzies made a successful ascent of Mauna Loa by way of Kapāpala. The route taken by Menzies was the 'Ainapō trail, which would become the preferred route used by inquisitive visitors to ascend Mauna Loa. Menzies took a canoe from Kealakekua Bay, stopping first at Manukā and then at Pakini Village near Ka Lae, where he left the 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, because of the strong trade winds, 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) 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. (Menzies 1920:181-183)

Menzies (1920:184) 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." As Menzies followed an inland trail, many of his descriptions are centered on the plantations and horticultural techniques he encountered along the way (Kelly 1980). He spent the night at a village called Kī'olokū on a plantation belonging to Keawaheulu, and then continued on his journey, stopping at

other inland plantations at Punalu'u and Kapāpala that belonged to Kamehameha. The exploring party approached Kapāpala and wrote of their experience:

Though we had much reason to be satisfied every step we went, with the kind attentions and unbounded hospitality of the natives, yet we could not be now a little out of temper with them at the great distance they were taking us as it were round the foot of the mountain, till the afternoon we reached a fine plantation called Kapapala, belonging to the king, from which they told us we were to ascend the mountain. As the chief had here to provide his last supplies of provisions for our journey up, we were obliged to stop for the night to allow him some time for that purpose.

In the evening we sent back one of the natives to Kealakekua with a note to Capt. Vancouver to relieve any anxiety he might be under respecting us, and to acquaint him with the distance we had come and the probable time it would still take us to accomplish our object. We were now within a few miles of the volcano, [Kīlauea] of which there seemed to be this day a considerable eruption, and as the wind blow from that direction, the smoke, dust and ashes arising from it proved very troublesome to our eyes in traveling with our faces towards it.

February 13th. Before we set out on the morning of the 13th, I observed the barometer at eight, when the mercury stood at 28 in. 20 pts., which made our height at this place 1800 feet above the level of the sea. The thermometer was at the same time 67 degs. [degrees].

After breakfast, everything being got ready, and the party arranged, we continued our march through the plantation for two or three miles further, and then began our ascent up the south-east side of Mauna Loa in an easy slanting direction, passing through groves of trees and clear spots alternately by a narrow rugged path without meeting any more cultivated ground after we quitted the plantation of Kapapala, or any houses till towards sunset, when we came to two or three old huts where our guides told us we must encamp for the night. The chief no longer depended on his own knowledge of the path, but brought men with him from the last plantation to conduct the whole party up the mountain, which now lay between us as Kealakekua. We had the volcano to our right most part of this day and in the forenoon the smoke and ashes arising from it made the air very thick, which at times proved very tormenting to our eyes.

At sunset the thermometer was at 54 degs., and the barometer stood at 26 in. 50 pts., which made our height from the sea 3,510 feet. (Menzies 1920:187-189

The following day, on February 14th, Menzies (1920:189) and his entourage continued up the slopes of Mauna Loa, which was covered in snow, passing through the same elevation as the current project area where he commented that "and yet we were not here advanced half way up the woody region of the mountain." Menzies (1920) commentary continued thusly:

...we again set forward up the mountain in a reversed oblique direction to what we came the day before, but in so winding and circuitous manner and through such pathless and rugged tracts, avoiding clumps of forest here and there, that, had we not good guides with us, we should have met with insurmountable difficulties.

Towards the evening, we reached the upper verge of the forest nearly over Kapapala, where we encamped for the conveniency of having wood at hand to burn and erect our huts with. The natives having pitches upon a clear spot overgrown only with strong tall grasses, they all set to work and in the course of two hours erected a small village of huts sufficient to shelter themselves and us comfortably for the night. These huts, though finished with such hurry, were neatly constructed and well thatched all over with long grass. A large one was built in the middle of the village for us to eat and sit in, besides a small one for each of us to sleep in, where they spread our bedding on a thick layer of the long grass, so that we enjoyed our repose comfortably as we could wish. (Menzies 1920:189-190)

Concerning the plants observed by Menzies while passing through Kapāpala (at the same elevation as the project area), he wrote:

In this day's march we saw many strange looking plants, different from any we had before observed, but very few of them being either in flower or seed, it was not possible to make out what they were. Near our encampment I found a large beautiful species of *Vicia* clambering up amongst the thickets in full bloom. (Menzies 1920:190-191)

2. Background

Unwilling to endure the icy conditions and in fear of becoming ill, the native guides and the “old chief Luhea” refused to accompany the entourage further up Mauna Loa beyond the 6,500 foot elevation (Menzies 1920:192). Menzies parted way with his guides and proceeded up the snow-capped summit of Mauna Loa. It would another three decades after Menzies 1794 visit that the next western visitor would pen a description of Kapāpala.

William Ellis’ 1823 Pass Through Kapāpala

Efforts to grow Hawai‘i’s Calvinist mission commenced in 1823 when British missionary, William Ellis arrived on the island of Hawai‘i with the goal of touring the island to identify potential locations in which to establish future church centers. While circuiting the island, Ellis journaled his experiences in which he wrote about the places he visited as well as the customs and mannerisms of the native people. Ellis visit post-dates the arrival of the first missionaries by four years, thus his descriptions sometime reflect the early religious and socio-cultural changes of the island during this period. Ellis spent some time in Ka‘ū and while traveling northward from Honu‘apo to Hokukano, Ellis expressed to his native guide, Makoa, his desire to visit Kīlauea. Unwilling to accompany Ellis and his party to Kīlauea for fear that the foreigners might “offend Pele or Nahoarrii, gods of the volcano...,” Ellis describes the interaction with Makoa:

If we were determined on going, he [Makoa] said, we must go by ourselves, he would go with us as far as Kapapala, the last village at which we should stop, and about twenty miles on this side of it; from thence he would descend to the sea-shore, and wait till we overtook him.

The governor, he said, had told him not to go there, and, if he had not, he should not venture near it, for it was a fearful place. (Ellis 1917:154)

Continuing with their journey, Ellis passed through the village at Ka‘ala‘ala which he described thusly:

The land, though very good, was but partially cultivated, till we came to Kaaraara [Ka‘ala‘ala], where we passed through large fields of taro and potatoes, with sugar-cane and plantains growing very luxuriantly.

Maruae, the chief of the place, came down to the road side as we passed by, and asked us to stay for the night at his house; but as Kapapala was only four miles distant, we thought we could reach it before dark, and therefore thanked him, and proposed to walk on. As our boys were tired with their bundles, we asked him to allow a man to carry them to Kapapala. He immediately ordered one to go with us, and we passed on through a continued succession of plantations, in a high state of cultivation. (Ellis 1917:161)

After departing Ka‘ala‘ala, Ellis and his party ventured north to Kapāpala where they met the head man, Tapuahi. Ellis described the features of his host’s house as well as some of the customs and traditions:

About seven o’clock in the evening we reached Kapapala, and directed our weary steps to the house of Tapuahi, the head man. He kindly bade us welcome, spread a mat in front of his house for us to sit down upon, and brought us a most agreeable beverage, a calabash full of good cool fresh water.

The thermometer at sun-set stood at 70°, and we sat for some time talking with the people around us. The air from the mountains, however, soon began to be keen. We then went into the house, and, although we were in a tropical climate, in the month of July, we found a fire very comfortable. It was kindled in a hollow place in the centre of the earthen floor, surrounded by large square stones, and gave both light and heat. But as there was only one aperture, which, as in the houses of the ancient Britons, answered the triple purpose of a door, a window, and a chimney, the smoke was sometimes rather troublesome. (Ellis 1917:161-162)

Few of the Hawaiian females are without some favourite animal. It is usually a dog. Here, however, we observed a species of pet that we had not seen before. It was a curly-tailed pig, about a year and a half old, three or four feet long, and apparently well fed. He belonged to two sisters of our host, who formed part of his family, and joined the social circle around the evening hearth.

In the neighbourhood of Kapapala we noticed a variety of the paper-mulberry, somewhat different from that generally cultivated, which grew spontaneously, and appeared indigenous. Large quantities of the dried bark of this plant, tied up in bundles, like hemp or flax, were piled up in the house where we lodged. It is used in manufacturing a kind of tapa, called mamake, prized throughout the islands on account of its strength and durability.

About eight o’clock a pig was baked, and some taro prepared by our host for supper. At our particular request he was induced to partake of it, though contrary to the etiquette of his country.

When we had finished, Tapuahi and his household assembled for family worship, after which we retired to rest. We had travelled more than twenty-miles, and two of our number had since the morning spoken four times to the people.

Soon after sunrise on the 31st, the people of the place were collected around our house. I requested them to sit down in front, and, after singing a hymn, preached to them a short and plain discourse. Mr. Thurston concluded the service with prayer. The people remained in the place for nearly an hour, and made many inquiries.

Kīlauea was erupting during Ellis's visit as an article published in the missionary newspaper *The Friend* explained:

During 1823 Kilauea was again in action, sending out a great flow which reached the sea at Kapapala, where it extended for six miles. Mokuaweoweo, the summit crater of Mauna Loa, was active for eighteen days in June, 1832, but the flows did not reach the ocean. (*The Friend* 1907)

According to an 1863 *Report of Churches in South Kona Hawaii* prepared by John D. Paris, by 1826, the first church located in South Kona was established under the Reverend James Ely. This church serviced members from "Kapuohao [Pu'u 'Ōhau] on the border of North Kona to Kapapala—the distance of more than one hundred miles" (Paris 1863:1). Paris (1863) also reported that the Chief Naihe and chiefess Kapi'olani were among the first Hawaiian converts to be admitted into this church. Kamakau (1992) reported that in 1824 just a year after Ellis' visit to Kapāpala, Chiefess Kapi'olani, who was the daughter of Hilo chief Keawemauhili and Ululani, made a trip to Kīlauea where she defied the priestess of Pele, and her *kapu* and professed her faith in Jehovah. Such act reflects the Christianization of some of the *ali'i* during this period.

E.W. Clark's Brief Visit to Kapāpala

In February of 1829, missionary, E. W. Clark submitted a letter to the American Board of Commissioners For Foreign Mission (ABCFM) detailing his trip around Hawai'i Island. Entering Kapāpala from Kīlauea, Clark penned the following:

After passing this lava, we came to a rich & fertile soil & about 8 o'clock in the evening arrived at Kapapala exceedingly fatigued, & wet to the skin by the tall grass through which we had travelled. We lodged with the same man with whom the deputation put up when they passed this way. We arose after a restless night & pursued our way over a fertile country to Punaluu, a small village on the seashore in the division of Kau. (Clark 1829:763)

An 1835 missionary census counted a total of 4,766 Hawaiians living in the district of Ka'ū with some 394 residents listed for the lands between Keāwi to Kapāpala (Schmitt 1973:30). Mission station reports from 1844 indicated that there was a mission school with 45 students "near Kapapala" (Paris 1844:3), however, no other locational information was provided. By the early 1840s the ABCFM saw the need to establish a permanent mission station in Ka'ū. 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, but 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 (Brandt et al. 2019). In November of 1841, the first Protestant church—a grass house built on a large stone enclosure—was erected at Wai'ōhinu (Paris 1926).

Chester H. Lyman, 1846 Observes Canoe Sheds in Kapāpala and Population Decline in Ka'ū

Another missionary to tour through Kapāpala was Chester H. Lyman who visited in 1846 and approached Kapāpala from Kīlauea. As reported by Handy and Pukui (1998:231) Lyman "encountered dwellings and canoe-making sheds, the first of such to be seen on descending the mountain." Handy and Pukui (1998:231) further add:

He was impressed with the green hills, the moist state of the soil, the "several horses with cattle and goast" feeding near the chief's house; and "the fires of Kilauea which shone up magnificently on the clouds like the light of a conflagration at evening."

As noted above, during Lyman's visit, Kīlauea was erupting which impacted a portion of Kapāpala, as described below:

He [Lyman] found the usually lush country below Kapapala (and extending as far as Waiohinu) "recently burned over, the black roots of the tufts of grass, the wilted and blackened shrubs, and the smoke stones [presenting] a most dismal prospect for many miles." (Handy and Pukui 1998:239)

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

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was taken, the population of the Ka‘ū District had declined to 3,010 persons (Kelly 1980). There is no single reason for the decrease in population, rather it occurred through an accumulation of changes that took place after Western contact. One often 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 in 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).

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, Chester Lyman, who described Honu‘apo as a pleasant village set among coconut trees, with a canoe landing, and “the hills back of it...cultivated with sweet potatoes, taro, etc.” (Lyman 1846:9) 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 was told that another fire occurred in 1830 or 1831 that “burnt nearly the whole district”, and he reported that, “the natives speak of four such burnings as having taken place within the memory of their aged men” (Lyman 1846:14). The Government’s taxation policies were another contributing factor to the depopulation of Ka‘ū. As the Rev. Paris wrote in his 1846 annual report:

...The population of Kau from all the information I have been able to gather, has been gradually diminishing for years but during the past year and especially the last six months it has been much more rapid. The influenza swept off a great many of the aged, the more feeble & infirm, & laid the foundation of disease on many of the strongest & most healthy constitutions which has greatly swelled the lists of mortality ever since.

Long and pinching famine for the last few months, has also contributed not a little to increase the number of deaths. Few, if any have died of actual starvation. But the sufferings of the very poor, the aged & sick, have been very great, & the nature of their food has been such as to produce diarrhea & other deseases [sic] which have terminated in death. Mortality has been very great among the children.

Another cause of depopulation has been the course pursued by Government officers, in reference to taxes. They require that all taxes be paid in Silver & gold & nothing else. But there is no silver in Kau. It does not grow there. The soil is good but is not adapted for the cultivation of silver & gold. Consequently all our able bodied men have gone money hunting - Some with their whole families & not a few of them have taken up their abode in the Cities of dollars & cents. If the people are compelled to pay their taxes in money only, I am satisfied it will be the cause of draining Kau of its inhabitants. This will also be the case with all districts similarly situated, they will be depopulated, to enrich the Government & their inhabitants will become hewers of wood & drawers of water to a foreign people.

(ABCFM 1846 in Uyeoka et al. 2012)

Taxation levied on the people took the form of poll taxes, land taxes, and labor taxes (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 schools were subsidized from the King’s share of the labor tax, but in 1846 the burden of a school tax was also placed directly on the people (Kelly 1969).

In 1847, there were 764 pupils enrolled in school in the district of Ka‘ū (460 Protestant, 340 Catholic). By this time instruction at the Protestant school at Punalu‘u had ceased, but 50 students were still enrolled at the nearby Nīnole school (Kelly 1969). A decade later (by 1857), enrollment in the entire district of Ka‘ū had decreased even further to a total of 235 pupils, and the school at Nīnole had also shut its doors (ABCFM 1849).

In addition to population decline, Paris describes other changes to lifeways that he had noticed in the Ka‘ū District since 1841. Paris (1849) writes that most of the Natives were now clothed on the Sabbath in European fabrics, and even European style, that the structure and comfort of the Native houses had been considerably improved, and that many of the yards and gardens were now enclosed, in his opinion, greatly improving their appearance. In 1849, Rev. Paris’ time in Ka‘ū came to end. During that year Paris returned to the United States with his daughters for an extended sojourn. In 1851, Paris returned 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 of the Catholic mission continued to serve in Ka‘ū and Puna until 1848, when he transferred to Kona, where

he died in 1859 at the age of forty-five. Paris and Maréchal were the first of many missionaries to reside in Ka‘ū during the sweeping social and economic changes of the mid-19th century.

KAPĀPALA DURING THE MID TO LATE 19TH-CENTURY TO PRESENT DAY

The mid to late 19th century brought about sweeping changes including the conversion to a Euro-American model of private property which paved the way for large-scale commercial industries including ranching and sugar. These industries significantly altered the traditional lifeways and had a profound impact on the social fabric and physical landscape of eastern Ka‘ū.

Māhele ‘Āina of 1848

By the mid-19th-century, the Hawaiian Kingdom was an established center of commerce and trade in the Pacific, recognized internationally by the United States and other nations in the Pacific and Europe (Sai 2011). As Hawaiian political elites sought ways to modernize the burgeoning Kingdom, and as more Westerners settled in the islands, major socioeconomic and political changes took place, including the formal adoption of a Hawaiian constitution by 1840, the change in governance from an absolute monarchy to a constitutional monarchy, and the shift towards a Euro-American model of private land ownership. This change in land governance was motivated in large part by ex-missionaries and Euro-American businessmen in the islands who, in pursuit of self-interest, challenged the rights of the King and chiefs to dispossess them of lands at will. During the reign of Kamehameha III, the *ali‘i* and foreigners compelled the government to enact a series of laws that would ultimately westernize the traditional land tenure system (Lam 1989).

The *Mō‘ī* (Ruler) Kauikeaouli (Kamehameha III), through intense deliberations with his high-ranking chiefs and political advisors, separated and defined the ownership of all lands in the Kingdom (King n.d.). They decided that three classes of people each had one-third vested rights to the lands of Hawai‘i: the *Mō‘ī*, the *ali‘i* and *konohiki*, and the *hoa‘āina* (a persons to whom the *konohiki* or *haku‘āina* commits the care of their land). In 1846, King Kauikeaouli formed the Board of Commissioners to Quiet Land Titles (more commonly known as the Land Commission) to adopt guiding principles and procedures for dividing the lands, grant land titles, and act as a court of record to investigate and ultimately award or reject all claims brought before them (Bailey in Commissioner of Public Lands 1929). All land claims, whether by chiefs for an entire *ahupua‘a* or *‘ili kūpono* (nearly independent *‘ili* land division within an *ahupua‘a*, that paid tribute to the ruling chief and not to the chief of the *ahupua‘a*), or by *hoa‘āina* for their 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) to be considered. This deadline was extended several times for chiefs and *konohiki*, but not for native tenants (Soehren 2005a).

The King and some 245 chiefs spent nearly two years trying unsuccessfully to divide all the lands of Hawai‘i amongst themselves before the whole matter was referred to the Privy Council on December 18, 1847 (King n.d.; Kuykendall 1938). Once the King and his chiefs accepted the principles of the Privy Council, the *Māhele ‘Āina* (Land Division) was completed in just forty days (on March 7, 1848). The names of nearly all of the *ahupua‘a* and *‘ili kūpono* of the Hawaiian Islands, as well as the names of the chiefs who claimed them, were recorded in the *Buke Māhele* (*Māhele* Book) (Buke Māhele 1848; Soehren 2005b). As this process unfolded, King Kauikeaouli, who received roughly one-third of the lands of Hawai‘i, set aside a portion which was designated as public lands that could be sold to raise money for the government and also purchased for fee simple title by his subjects. Accordingly, the day after the division when the name of the last chief was recorded in the *Buke Māhele*, the King commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike the King, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive their Land Commission Awards (LCAw). The chiefs who participated in the *Māhele* were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as “Government Land.” The lands personally retained by the King became known as “Crown Land.” Lastly, the lands received by the chiefs became known as “Konohiki Land” (Chinen 1958:vii; 1961:13). To expedite the work of the Land Commission, all lands awarded during the *Māhele* were identified by name only, with the understanding that the ancient boundaries would prevail until the lands could be formally surveyed.

At the time of the *Māhele*, the 172,780-acre *ahupua‘a* of Kapāpala was retained by the King Kamehameha III thus establishing it as Crown Lands (Buke Māhele 1848; Iaukea 1894). Additionally, Keauhou, an *‘ili* of Kapāpala containing roughly 50,740 acres was claimed by the chiefess Victoria Kamāmalu as parcel 11 of LCAw. 7713. This division effectively established Keauhou as an *ahupua‘a* independent from Kapāpala.

As the King and his *ali‘i* and *konohiki* made claims to large tracts of land via the *Māhele*, questions arose regarding the protection of rights for the native tenants. To resolve this matter, on August 6, 1850, the *Kuleana* Act (also known as the Enabling Act) was passed, clarifying the process by which *hoa‘āina* could claim fee simple title to any portion of lands that they physically occupied, actively cultivated, or had improved (Garavoy 2005). The *Kuleana* Act also clarified

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access to *kuleana* parcels, which were typically landlocked, and addressed gathering rights within an *ahupua'a*. Lands awarded through the *Kuleana* Act were and still are, referred to as *kuleana* awards or *kuleana* lands. The Land Commission oversaw the program and administered the *kuleana* as Land Commission Awards (LCAw) (Chinen 1958). Native tenants wishing to make a claim to their lands were required to register in writing those lands with the Land Commission, who assigned a number to each claim, and that number (the Native Register) was used to track the claimant through the entire land claims process. The native tenants registering their *kuleana* were then required to have at least two individuals (typically neighbors) provide testimony to confirm their claim to the land. Those testimonies given in Hawaiian became known as the Native Testimony, and those given in English became known as Foreign Testimony. Upon receiving the required information, the Land Commission rendered a decision, and if successful, the tenant was issued the LCAw. Finally, to relinquish any government interest in the property, the holder of a LCAw obtained a Royal Patent Grant from the Minister of the Interior upon payment of the commutation fee.

No known *kuleana* claims for land in Kapāpala were made by the *hoa 'āina*, thus no additional information concerning land use and practices of the mid-19th century were obtained. Although the *Māhele* was meant to provide native tenants with fee-simple parcels of land from which they could earn a living, it also resulted in the land becoming a commodity to be bought and sold (Kelly 1969). Those with money could buy (or lease) land, and those without, could not. As one Hawaiian writer of the time put it, "if anyone of us becomes assistants of the chiefs, his pay for the most part is in goods; the most of the dollars are for the foreign chiefs... foreigners come on shore with cash, ready to purchase land; but we have not the means to purchase lands; the native is disabled like one who has long been afflicted with a disease upon his back...we are not prepared to compete with foreigners" (Kenui et al. 1845:119). During the middle part of the nineteenth century, the majority of the Hawaiian population was still participating in a subsistence based economy, while foreigners had access to extensive monetary resources. As a result, many Hawaiian families, who were new to land ownership and the market economy, were dispossessed of their homes and fields, and foreigners were able to buy up large tracts of land. The *Kuleana* Act of August 6, 1850, even prohibited the landless *maka 'āinana* from conducting economic activities on unassigned Government Lands, from which they had previously secured a living. Forced to pay taxes or lose their land and houses, families with no local source of income sent the young and able-bodied to trade centers such as Hilo and Honolulu to earn money. Some families lived in fear of being jailed or pressed into hard labor because they had no money to pay the taxes demanded of them (Ladd and Kelly 1969).

Boundary Commission Testimony

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, by name only, as a part of the *Māhele*. Subsequently, in 1874, the Boundary Commission was authorized to certify the boundaries for lands brought before them. As a part of this process, the Boundary Commission gathered testimony from informants, who were typically older native residents who learned of the boundaries from their ancestors, relatives, or neighbors. The boundary information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and simultaneously transcribed into English. Although hearings for most *ahupua'a* boundaries were brought before the Boundary Commission and later surveyed by Government employed surveyors, in some instances, the boundaries were established through a combination of other methods. In some cases, *ahupua'a* boundaries were established by conducting surveys on adjacent *ahupua'a*. Or in cases where the entire *ahupua'a* was divided and awarded as Land Commission Award(s) and or Government-issued Land Grants (both of which required formal surveys), the Boundary Commission relied on those surveys to establish the boundaries for that *ahupua'a*. Although these small-scale surveys aided in establishing the boundaries, they lack the detailed knowledge of the land that is found in the Boundary Commission hearings.

One of the challenges with transcribing handwritten documents is legibility. In some portions of the testimony, the handwriting could not be deciphered with great certainty. Thus, in those areas, question marks (?) have been added to indicate illegibility. Furthermore, to improve readability, the authors of this study have italicized Hawaiian words and phrases (which are used frequently through the testimony); bracketed texts have been added to clarify information or define Hawaiian words and phrases used (on the first mention); traditional place name specific to Kapāpala have been bolded; and any described cultural practices or historic resources have been underlined for emphasis.

For Kapāpala, the Boundary Commission held a hearing at the home of James W. "John" Kauhane in the neighboring land of Keāiwa. Kauhane, who originally worked as a pastor servicing the Ka'ū District, later became a district judge, which was his role at the time the Boundary Commission hearings were gathered (Morris and Benedetto 2019). On October 20th, 1873, upon the application of John O. Dominis, Agent of Crown Lands, the Boundary Commission heard testimony from several native residents to help settle the boundary of Kapāpala. Testimony was heard from two *kama 'āina*, a native-born or a person familiar from childhood with any locality (Lucas 1995:48), Kenoi and

Kaonohi, as well as Kauhane and Rufus A. Lyman, the Commissioner of Boundaries. Their testimony, which has been transcribed (from scans of the original documents) in its entirety, is presented below.

Kenoi K sworn

I was born at **Kapapala** Kau [Ka‘ū] at the time of Kiholomua [ca. 1804]. Moved to Oahu ten years ago before that time I had always lived at **Kapapala**. Am a *kamaaina* [*kama‘āina*] of said land and know the boundaries. They were pointed out to me in olden times, when it was *kapu* [prohibited] to catch birds on any land but the one you lived on and if you did so the birds were taken away from you. Keaweehu and Kama his nephew pointed out the boundaries to me. Both of the men are now dead. They pointed out the boundary lines between **Kaalaala** and **Kapapala** from shore to mountain. Kaheana, my father who was a *kamaaina* of **Kapapala** showed me the boundary line between this land and **Keauhou** in Kau from seashore to mountains. He is dead and buried in Kapapala.

Kaalaala bounds **Kapapala** on the south side from the shore. Then **Pohakuloa**, then to **Ahulili** 1st and **Ahulili** 2nd. Thence to **Waimuku** 1st and **Waimuku** 2nd, **Kailiula** 1st. Thence to **Kailiula** 2nd. Then to **Kaaimakamaka**, thence to **Puukoa** and to **Makakupa** 1st, **Makakupa** 2nd, **Makakupa** 3rd and from thence to **Makakupa** 4th. Then **Kaalaala**. The boundary at shore between **Kaalaala** and **Kapapala** is at a hill on **puu lepo** [dirt hill] call **Napuuonaelemakule**. Thence mauka to **Kukalaula** a cave in the pahoehoe [pāhoehoe], where people used to live. The boundary follows along an old trail all the way from the seashore. Thence the boundary runs to **Keanaonaluhine**, **aa** [‘a‘ā] and a cave in the pahoehoe. Thence to **Puahī** two hills and two *ahuas* [‘āhua; mound or heap of stones] running between he hill. Thence to **Kapai** an awaawa [valley or gulch] and (old trail from shore runs along boundary) cave. Thence to **Puulehuopaniu**, on pahoehoe [pāhoehoe]. Thence to a hill of ??? called **Punahaha**, along the road to where **Kukilauiilii** used to stand. Thence along **Makakupa** to **Moomamani** a *heiau* [temple] and *ahi pu* [?]. Thence along **Puukoa** to **Kapaliokee ili aina** [‘ili ‘āina; land division smaller than an *ahupua‘a*] and *awaawa*. Thence along **Pohakuloa** to **Puuokamalii** at the Government Road on the edge of the pahoehoe towards Hilo. Thence to **Naunu** the *mauka* corner of **Pohakuloa** the *lae ohia* [‘ōhi‘a covered promontory] on *pali* [cliff]. Thence along **Ahuililii** to **Kaholoina**, **kauhale mamaki** [māmaki settlement] + **kahawai** [stream]. The boundary runs up in the *kahawai* from **Kaholoina** to **Waiheka**. Thence up the *kahawai* to **Puohoakalei piha kauhale kalaiwaa in koa** [full canoe carving settlement in the *koa* forest]. Thence up the *kahawai* to **Omalunui** a large *ohia* grove. This is the strip of *ohia* (running *mauka* and *makai* through the woods) that you see from the Government Road. Thence up the *kahawai* through the *lae ohia* to **Kapapaulaula**, the red *pahoehoe* above the woods. Thence to **Kilohana** a small hill. Thence the boundary runs *mauka* to a **Poohina**, where **Kaalaala** is cut off by **Kahuku**. Thence along a *poohina* along the land of **Kahuku** to **Pohakuhanalei**. Thence along the district of Kona to **Mokuaweweoe**. I have heard that **Keauhou** of Kona gave to Pohakuhanalei, a hill on Mauna Loa. Thence to **Puulaula**, a large hill on the brow of the mountain at the *mauka* corner of **Keauhou** of Kau. I do not know what land bounds **Kapapala** from **Mokuaweweoe** to **Puulaula**. Thence the boundaries runs *mauka* from **Puulaula** along the land of **Keauhou** of Kau, to **Kilomoku**. The boundary follows along the edge of the *aa* which is in **Kapapala**, to this point [Kilomoku] which is a *lae ohia*. Thence to **Wekahuna**, the high bluff on the *mauka* side of **Kilauea** where the old horse bones die, close to the road and a little towards Kau from the highest part of the bluff. Thence to **Kamokukolau** the boundary passing through the crater and south lake; **Kamokukolau** is a *lae ohia makai* of the crater where I used to live. The boundary passes a short distance to the south of the small crater called **Kaanakaakai**, said crater being on **Keauhou**. From **Kamokukolau** the boundary runs *makai* to **Aiaawa** a *lae ohia awaawa*. Thence cross the Kau Road to Puna and run to **Kailiohia**, on the *pahoehoe*. Thence to a hill and *pali* called **Haleolona** where you can see the shore at **Keauhou** and **Halapee**. This is where Kapahee killed my wife and child. There are two hills at this place and the boundary passes between the hills. Thence down the *pali* and to another *pali* called **Lapo**. Thence to the *heiau* called **Makaloa** at **Kuuhala** on the seashore. Ancient fishing rights extending out to sea.

C.X. ^dby J. Kauhane.

The tall woods and at **Papapaulaula**. All trees end below **Kilohana**. An *ahupohaku* used to stand below **Kilohana**. I have been as far as this place but not to a *poohina*. The *kamaaina* told me that the boundary run to *aa* but did not tell me of any mark that denoted the boundary. It is some distance from **Papapaulaula** to **Kilohana**.

C.X. ^dby Commissioner

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I stated before that these lands were cut off at the *mauka* edge of the woods by Kahuku cutting of Kaalaala a *kamaaina* induced me to join these at the a *poohina*. The truth is that Kahuku and Kapapala join above Kilohana at a *poohina*; and do not join at Papaulaula on at the edge of the woods at a *poohina*. Papaulaula is at the south end of the *pali* of **Waaloa**. What I have testified to today is as the boundaries were pointed out to me in olden times. I never heard in olden times that Kaalaala cut off Kapapala at the upper edge of the woods. I heard that the day I have evidence in Hilo (see folio 155). The geese and *uwau* on the mountain all belonged to Kahuku and from the aa to Hamakua they all belonged to Kaalaala. The *Oo* and *Mamo* all belonged to Kapapala. There was formerly a road running from Aua's to Kalanihale, (where *halau* used to stand). Thence running past **Keawewai Kamokuiliahi** and to **Kalaieha** but I never heard of any *ili* or *ahupuaa* or *kihapai* on said road. The land belonged to Kapapala; but the geese and *uwau* all belonged to Kalaala [Kaalaala]. I heard that when Nuunu and Kakohi *kaikaina* (younger brothers) of Liiloa [Liloa] (?? King of Hawaii) *he mau kahuna* [some *kahuna*; *priests or experts*] were taken on a canoe and carried to Naelemakule and set up there. They were ordered to take these *kahuna* to a hill called **Kapukapu**. They went from **Punaluu** in a canoe and fell asleep on the way. The canoe men thinking Naelemakule was the hill woke the *kahuna* up and so that became the boundary of the land. Taking a strip of land from Kapapala and giving it to Kaalaala. They lived where Aua lives at Moeala. Kaun?? Was their *kahu* [attendant] and as he was sick the Kau people carried them over the foot of the mountain into **Hamakua**, the *uwau* and geese were their meat and so the birds became the property of Kaalaala.

When the people used to gather sandalwood the *alii* [chiefs] of Kapapala Naihe and Aikanaka took it for Kaahumanu. The Kaalaala people went after sandalwood from their chief but the people of other lands in Kau used to go after sandalwood on Kapapala and take to their chiefs. This was at the last gathering of sandalwood for Kamehameha III to pay the debt. I do not know about the boundaries of Kaalaala and other lands, only those adjoining Kapapala. I do not know about the boundaries of Kapapala on the slopes towards Mauna Kea. I have never heard that Kapapala extends down that slope but that Mokuaweoweo and Puulaula are at the end of Kapapala.

Kaonohi ^k sworn

I was born at Hilo at the time of making the Peleleu [pre-1795] and have lived at Kau ever since the Okuu [ca. 1804]. Know the land of Kapapala and its boundaries. Commencing at the sea shore at a place called Puunaelemakule a hill between Kapapala and Kaalaala. Thence *mauka* to Makahuna a cave. Thence to Kilohana, an *oioina* [resting place for travelers] on the road to Puna. Thence to a cave called Kukalaula, on said road. Thence to Nahuakahoalii a *heiau*, thence to Puuainako. Thence to Keanaanaluhine, a cave near the Government Road. Thence to **Hapai** an *awaawa* and caves. Taro are *mauka* and one *makai* and the road between is the boundary. Thence to a *mawae pele* [volcanic fissure], an *oioina* on the road. Thence to Puulehuopaniu. The boundary used to run from this point to **Moenaoniu**, an *oioina* and from thence to **Keanaoloa** [on *makai* side of it] but in the time of Kamehameha I the boundary was changed from Puulehuopaniu to Puunahaha, a *puu* or *oioina*, and from thence it runs to **Keanoano** on *pahoehoe*. Thence to **Keanapaki** a cave and thence along Makakupa 1st (Kukuilauii is on Kaalaala) [small lands ??? ??? to **Kapaliohee**]. Thence the boundary of Kapapala runs along the edge of the *pahoehoe* along Makakupa 1st, Makakupa 2nd, Makakupa 3rd and Makakupa 4th. **Pukoa**, **Kamakamaka**, **Kailiula** 1st and Kailiula 2nd, **Waimuku** 1st and Waimuku 2nd and **Ahulili** 1st and Ahulili 2nd to Pohakuloa. Thence along Pohakuloa to the east corner where Pele (F.S. Lyman) surveyed. Thence *mauka* to the Hilo side of **Puuokamalii**. Thence to *kahawai* **Opilopilo** on the Hilo side of **Puuhana**. The *mauka* corner of Pohakuloa, thence along Ahulili to the *mauka* corner of this land (this is as Kaili, *kaikaina* of Halimanui pointed it out ?? as along Kaalaala, the boundary running towards Hilo to a *kahawai* called Opilopilo. Thence along this *kahawai* (I have never been above this place and what I know is from Keaweehu and Kama). They told me the boundary runs up the *kahawai* passing **Puuhaokalai** and thence still following the *kahawai* to *lae ohia*. The tall trees being on Kapapala and the short ones on Kaalaala. Through the woods but I do not know the name of the point at the *mauka* edge of the woods.

Have been told that Kaalaala cuts Kapapala off at the *mauka* edge of the woods. That area fit for timber and that from thence Kaalaala runs along the *pahoehoe*, above the woods to Kona, Hamakua, and Hilo.

I went with Keaweehu to Keawewai after sandalwood, and he said it was on Keauhou. He then went to **Keahoaimakakoloa**, then to **Makapani** a cave. He said part of it was **Olaa** and part Kau. Kapapala or Keauhou. Then to **Nahaleawai kauhale**. Thence to **Punaluu** a *heiau*. The sand at Punaluu came from this place. Thence to Kaamau??loa, *aa makai* of a hill. Said hill being a Puuulaula but that *aa* was covered up by the flow of 1852.

Keaweehu said that the sandalwood belong to Kapapala.

I do not know the boundaries between Kaalaala and Kapapala on the mountain but have always heard that Kaalaala cuts Kapapala off at the upper edge of the woods.

There was a road running along where the Government Road to Kilauea now is and up to Keawewai and the place I saw when I went after sandalwood and the uwau and geese on the mountain all belonged to Kaalaala, and the other birds belonged to Kapapala.

C.X. ^d

Kuihelani was konohiki [headman] of Kahuku and Kapapala. Kaalaala and Makaka all had different *konohiki*, as they used to be large lands. All the sandalwood growing on the pahoehoe above the woods belonged to Kapapala but the uwau and geese to Kaalaala and we used to go after the sandalwood on the pahoehoe above the tall trees but the geese and uwau belonged to Kaalaala and Kapapala people could not take them.

Kaholoina is a *kahawai* on Kaalaala, **Waiheka** is a *kahawai* on Kapapala at some little distance from the boundary [further than from here to A?? ???]. I have not been on the mountains above Kaalaala [?? Makaka] Puuhaokalai is on Kaalaala. I do not know the old name for the small gulch on the boundary now called Opilopilo. It runs to Lae ohia Omalunui.

No more witnesses at hand.

Cas & continued until further notice is given to all interested parties.

R.A. Lyman

Commission of Boundaries 3^d J.D.

From the testimony cited above, we learn that knowledge of the *ahupua'a* boundaries was vital to the *kama 'āina* that lived therein as the boundaries firmly established their rights to certain resources (i.e. what resources were permissible and prohibited) as well as the consequences for not adhering to these restrictions. The transmission of the *ahupua'a* boundaries along with its restrictions and consequences was the cultural practice that upheld the rules governing resource procurement over the generations. The testimonies also give insight into trails that extended along the boundaries of Kapāpala, settlement areas, and the use of 'āhua to mark the *ahupua'a* boundaries. As described in the testimony, sometimes boundaries were obscurely marked by changes in the substrate or vegetation. The informants also identified specific plant resources including *māmaki* (*Pipturus albidus*), *koa*, 'ōhi'a, and 'ilahi (*Santalum freycinetianum*) and avian resources in Kapāpala including the now-extinct 'ō'ō (*Moho nobilis*) and *mamo* (*Drepanis pacifica*). *Nēnē* (*Branta sandvicensis*) and 'uwa'u (*Pterodroma sandwichensis*) were also identified, however, the informants specify that these resources belonged to Ka'ala'ala. The informants also specified forest settlements specifically around the *māmaki* growing areas (described as *kauhale māmaki*) as well as at least one extensive canoe carving area in the *koa* forest noted as *piha kauhale kālaiwa'a* at Pu'uhokalei. Collectively, the informants also identified four *heiau* including Makaloa located at Ku'uhala on the shore near the Keauhou boundary; Mo'omamani located along the Makakupa boundary, Nāhuaokahoali'i located along the southeastern boundary between the old Puna trail and the Government Road; as well as Punalu'u whose location could not be determined from the available information.

***Pulu* Trade and Other Mid-19th-Century Agricultural Endeavors**

With few economic options available, some people of Ka'ū turned to the *pulu* trade, an industry centered on the endemic *hāpu'u pulu* (*Cibotium glaucum*), a tree fern commonly found in the wet forested areas of Hawai'i. Harvesters, many of whom were of native descent went after the *pulu* or the soft, golden-colored fibers found at the top of the fern trunk. Although *pulu* was used traditionally to embalm corpses, the *pulu* harvested for this industry was exported to North America and used to stuff mattresses and pillows (Kepler 1998). The fibers were collected by cutting off the fern fronds and scraping the fibers of the stipe and sometimes the large tree ferns were cut down entirely or pushed over to get to at fibers. Once harvested, the *pulu* was transported to the factories one of which was located near Nāpau Crater, in what is present-day Volcanoes National Park, for drying and processing (Cuddihy and Stone 1990).

2. Background

The widespread trade in *pulu* began in Hawai‘i around 1851. By 1859, 300,000 pounds of *pulu* were being exported from the islands annually, and at its peak in 1862, *pulu* exports reached 649,000 pounds (Cuddihy and Stone 1990). The *pulu* trade had a detrimental effect on the people of Ka‘ū. However, in some cases, families were able to procure money from the trade to pay their taxes, but just as often they ended up in debt to the traders and lost their property as payment. Many gardens also suffered as the people spent more time in the forests gathering *pulu* than they did cultivating their fields (Kelly 1980). This led to crop failures, and at times resulted in famine.

In addition to the *pulu* trade, other crops that were cultivated at this time included corn, beans, and wheat. The February 18, 1858 edition of the *Pacific Commercial Advertiser* reported that in the “remote and little known district of Kau...the natives have gone largely into the cultivation of wheat this year” (The Pacific Commercial Advertiser 1858:2). The incoming wheat crop was estimated from 2,000 to 3,000 bales, and that the bean crop was estimated at 20,000 pounds. That same article relates that more than half of the bales of *pulu* brought to Honolulu on the last shipment were from Ka‘ū. The article goes on to report that the district is in need of a suitable harbor, or a good road to Kona, as the one to Hilo was a long and wet route. The lack of suitable infrastructure made the marketing and selling of produce and goods especially challenging, thus this industry was shortlived (Kuykendall 1953).

Another detriment to agricultural pursuits in Ka‘ū during the mid-nineteenth century was free-roaming livestock, such as cattle, sheep, and goats which had been brought to Hawai‘i on the ships of Western explorers during the late 18th century. Upon the introduction of these animals, Captain Vancouver advised Kamehameha to place a protective ten-year *kapu* on the animals to allow them to multiply and roam freely throughout Hawai‘i Island. By the mid-19th century, the unregulated population of livestock became a nuisance to the native farmers and evidence of the impact on the greater environment was cause for major concern. Native residents were also left to defend their gardens and homes from the destruction caused by the free-roaming animals. During the 1830s, under the administration of Kauikeaouli (Kamehameha III), *vaqueros* (cowboys of Mexican, Indian, and Spanish descent) were brought to Hawai‘i to train Hawaiians in the handling of both horses and wild cattle (Bergin 2004). An article published in the Hawaiian Language newspaper *Ka Nūpepa Kū‘oko‘a* by W. Kahalelaau in 1862 describes some of the impacts of the free-roaming livestock in Ka‘ū:

There are great troubles in our lands here in Kau, and here are the troubles. 1. the heat; 2. famine; 3. animals. Of the three said troubles, the animals are of greatest concern. We are not troubled by the animals owned by the natives, rather those belonging to the Haole, they dig the land bare, swarm the land and crush the plants. There is little we can do; the natives work and the cattle crushes our work. The places previously cultivated by the ancient people were known for its fertility and produced much food, like melons, sugarcane, and other things. However, within the last two years we have realized our trouble and our great misfortune. It is appropriate for the Haole’s animals to roam on their own land, but the trouble is they roam on our land. We did have a famine a few years ago because of too much sun, however when the rain fell life was possible, and we planted plants and the trouble ended. Now, there is no suitable place to plant the plants. The only appropriate places are those paid for with money, with the misfortune of another.

How do we resolve this trouble of ours? If any of you, my dear friends know the source to address this trouble, please make it public known... (Kahalelaau 1862:4)

The matter of dealing with the free-roaming livestock, eventually led to the emergence of formal ranching on the islands. For Ka‘ū, Kapāpala and later Kahuku emerged as the epicenter of the district’s ranching operations.

History of Kapāpala Ranch, the 1868 Eruption, and the Establishment of the Ka‘ū Forest Reserve

The first organized ranching operation in Ka‘ū were centered at Kapāpala when around 1860, Frederick S. Lyman, the third son of Hilo’s founding missionary family established a small ranch at ‘Ainapō. Lyman’s ‘Ainapō ranch eventually grew to become Kapāpala Ranch, the largest and longest running ranch to operate in the district. Lyman constructed a small grass hut at ‘Ainapo where he lived with his wife Isabella Chamberlain until the disastrous earthquake of 1868 (Vredenburg 1952). Lyman’s ranch was eventually acquired by Hilo businessmen, Charles Richardson and William H. Reed who on March 1st, 1860 expanded Lyman’s ranch by co-leasing the entire Kapāpala Ahupua‘a from King Kamehameha IV (Alexander Liholiho) to start their joint venture, Kapāpala Ranch (Cahill 1996).

Reed was known for constructing bridges (including the third and most substantial bridge across the Wailuku River), the first harbor, landing, and streets throughout Hilo, while Richardson was involved in lumber, leasing land, shipping, retail, and ranching (Valentine 2014). The ranch encompassed large tracts in Kapāpala and Keaīwa Ahupua‘a (acquired from F.S. Lyman in a separate transaction) and extended from the shoreline to the summit of Mauna Loa to include roughly 200,000 acres (Cahill 1996:129). It is important to highlight that there are no major streams on the ranch

property, however, there were numerous springs throughout the pastures and frequent rainfall attributed to the lush vegetation. The ranch, as it existed in 1861, was described by a visitor passing through Ka‘ū. The excerpt below describes the extent of the ranch as well a brief background on its founders:

...Mr. Richardson, an American who has a lease from the King of land to the amount of (at the lowest estimate) 70,000 acres, at a rental of only about \$300...His limits are not very well defined, and *he* considers that he has much more than that number of acres for his rent. He is keeping stock and goats, which last are very valuable. He asked us to have some coffee at his house which we were to pass, and we stopped there a few minutes on our way to Mr. Lyman's where we were to pass the night. (Korn 1958:58)

Mr. Richardson, an American...Probably Charles Richardson (1817-1879), a native of Vermont; arrived in the Islands in 1850. He and a cousin, Julius Richardson, together with a partner named W.H. Reed, owned an extensive tract in the Kau District called the Kapapala Ranch. In the mid-1860s they established the first hotel at the volcano. Lady Franklin described Richardson as “tall, delicate looking, humble & modest, wd [would] not sit down till I begged them to do...” (Korn 1958)

By 1862, fifty heads of cattle were purchased at auction by the partners and were put to pasture at Kapāpala. The two businessmen purchased additional cattle from Harry “Jack” Purdy, a cattleman at Parker Ranch in Waimea (Cahill 1996; Henke 1929). Reed and Richardson’s business proved to be lucrative for meat, cream, and butter—products the ranch produced for many years—that were readily available for sale in Hilo and Honolulu (Cahill 1996:96). In addition, hides from cattle and goats, as well as wool from sheep were sold along with *pulu*, that was once exported to California (Cahill 1996; Pukui and Elbert 1986). Reed and Richardson split their time between Hilo and Kapāpala where they oversaw ranch management and long cattle drives from pasture to pasture. After cattle were fattened, they were herded to the landing at Punalu‘u and shipped interisland via steamer to their destination.

Reed met Jane Stobie Shipman who was previously married to missionary William Cornelius Shipman, who had died of Typhoid fever in 1861. Reed and Shipman most likely met at one of the many gatherings for the “foreign” community ca. 1867, such as church or a social gathering at a private home (Cahill 1996:97). On July 6, 1868, Reed and Shipman were married at Haili Church in Hilo by Reverend Titus Coan, an American minister and missionary (Cahill 1996:98). The union between Reed and Shipman resulted in Reed gaining three step-children: William “Willie” Herbert, Oliver “Ollie” Taylor, and Margaret “Clara” Clarissa. For Reed, education was of utmost importance for his new step-children and as a result, he enrolled and paid for all three children to attend Punahou School on O‘ahu often writing to them and keeping them abreast on Hilo and homelife.

Several months before Reed and Shipman’s marriage, between March and April of 1868, a series of tremors culminated in a violent volcanic eruption that spewed from the southern flanks of Mauna Loa and cause significant damage throughout Ka‘ū. On April 2nd, 1868, in the afternoon, a powerful earthquake shook the Ka‘ū District with the epicenter emitting from the southern rift of Mauna Loa. This great earthquake triggered several natural disasters including a mudflow in Wood Valley (south of the project area), an avalanche at Pōhina cliff near Honu‘apo, and a localized *tsunami* that devastated many coastal communities (Dana and Coan 1868). As a result, wood and stone buildings in Ka‘ū were leveled including the Protestant stone church in Wai‘ōhinu (Cahill 1996). Many homes and lives were lost due to the earthquake and a subsequent landslide that devastated the residents of Wood Valley, south of the project area. Concerning the impacts of the landslide and the *tsunami*, W.D. Alexander in his book *The Great Eruption in Kau* wrote:

At length, on the 2nd of April, a terrific earthquake took place, which shook down every stone wall and nearly every house in Kau, and did more or less damage in every part of Hawaii

At Kapapala in eastern Kau, it caused a destructive landslip commonly known as the “mud flow.” An enormous mass of marshy clay was detached from the bluff at the head of the valley, and in a few minutes swept down for a distance of three miles, in a stream about half a mile wide and thirty feet deep in the middle, it moved so swiftly that it overtook and buried thirty-one human beings and over five hundred horses, cattle, and goats.

Immediately after this earthquake, a tremendous wave, forty or fifty feet high, rolled in upon the coast of Kau, sweeping away all the villages from Kaalualu to Keauhou, and destroying some coconut groves. Over eighty persons perished in a few minutes, and the survivors were left destitute and suffering. At the same time the crater of Kilauea emptied itself of its lava through underground fissures toward the southwest. The central part of the floor of the crater fell in, forming a pit three thousand feet long and five hundred feet deep, with sloping sides. (Alexander 1891:292-293)

2. Background

By April 7th, the lava that had emptied from Kīlauea via subsurface chambers burst out on the southwest slope of Mauna Loa in Kahuku Ahupua‘a at approximately the 5,000-6,000 foot elevation, southwest of the current project area (Alexander 1891; Hawai‘i Volcanoes National Park n.d.). Dana and Coan (1868:118) reported that “[i]n Kapapala, we were told that the fire had been seen several nights in a southeast direction, and that the natives had reported flowing lava there [at Kapapala]”. The lava flow that emerged at Kahuku “...spouted up in great fountains, several hundred feet high, and flowed to the sea, a distance of ten miles, in two hours” where it destroyed several houses, hundreds of cattle, and covered some four thousand acres of land (Alexander 1891:293). Although Kapāpala Ranch was somewhat spared, Reed still suffered losses. As a result of the 1868 eruption, the district of Ka‘ū was devastated and a giant crack extending in a southeast direction from Kīlauea through Kapāpala emerged, the location of which is shown on Hawai‘i Registered Map 510 from 1874 (Figure 15). This 1874 map depicts the project area within the “koa woods” portion of the ranch.

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, Wa‘ōhinu, or Pāhala, or moved out of the district altogether (Handy et al. 1991). By 1872 the population of Ka‘ū had further declined to 1,865 persons (Kelly 1969). The resilient nature of the Ka‘ū people was once again demonstrated as they directed their efforts toward rebuilding the impacted communities. Even in subsequent seismic events including one in 1887 that broke the ranch’s water tanks, shifted buildings off its foundations, and caused stone walls to crumble, homes were eventually rebuilt and material items replaced. Although altered, life in these communities resumed as it had for generations (Clark 1985).

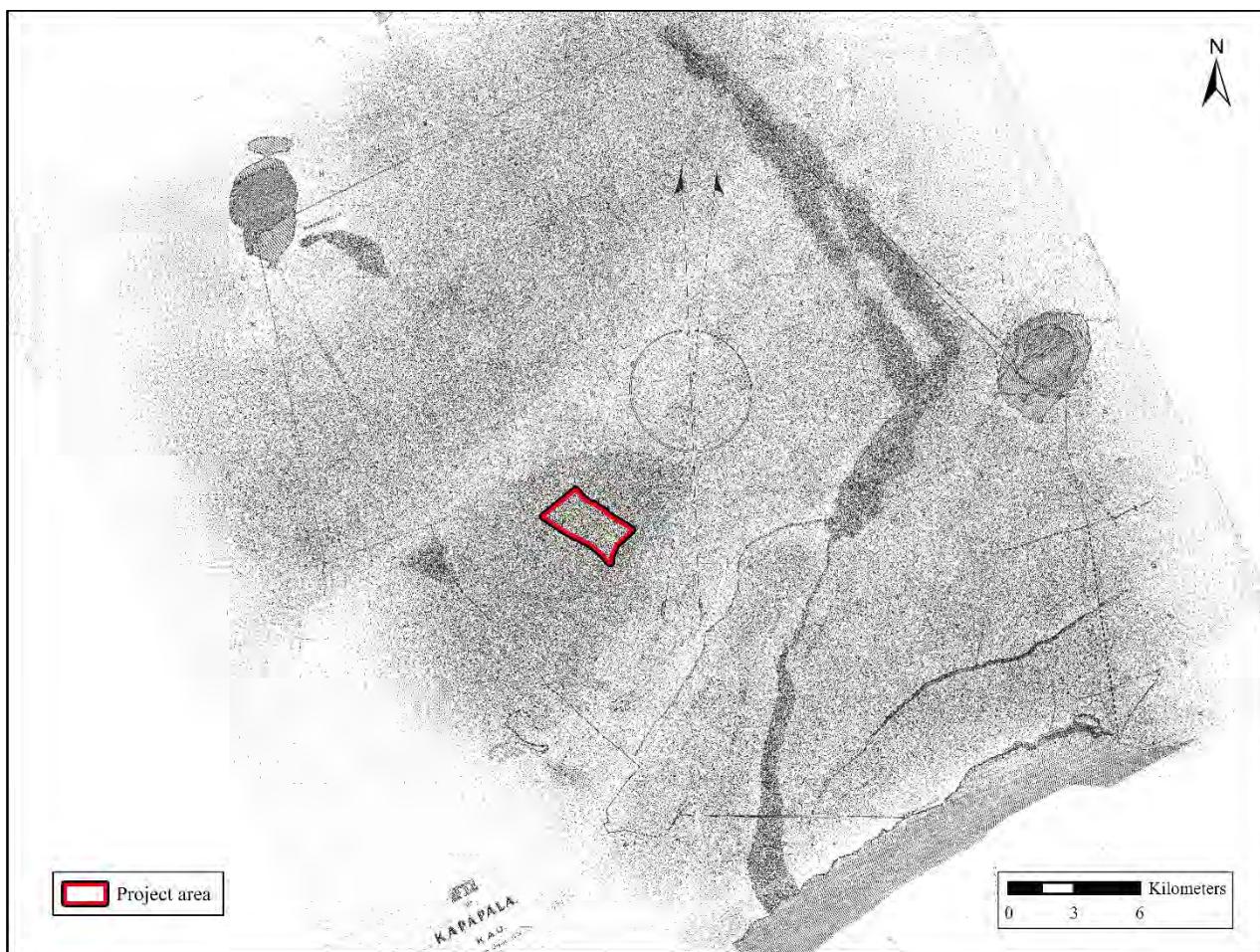


Figure 22. Hawai‘i Registered Map 510 from 1874 by Lydgate showing project area in the “koa woods” portion of Kapāpala Ranch and fissure extending from Kīlauea through Kapāpala.

By 1870, Willie and Ollie were enrolled at Knox College in Galesburg, Illinois to pursue higher education. Willie was interested in pursuing medicine, however, Reed suggested that his eldest step-son enroll in an accounting course as it “would prove valuable in almost any career” (Cahill 1996:116). In 1873, Willie enrolled in business school where he took bookkeeping and general business courses. A letter from Willie to Reed asked, “Don’t you want me to come home

& help keep books for you next fall?" (Cahill 1996:116). A month later, Reed wrote back to his step-son expressing satisfaction with his decision to enroll in "Commerical School" but also dropped a bombshell, that he purchased Charles E. Richardson's shares for Willie for \$17,000 granting him half of the business interests (Cahill 1996:116). Reed encouraged Willie to stay and complete his studies as when he returned home, he had three ranches and the lumber business to manage.

Willie returned to Hilo in the fall of 1873, where he was trained by Reed on the daily operations of running the ranch, knowledge of property management, and bookkeeping duties. For the next two years, Kapāpala Ranch served as Willie's new home. In 1875, *The Hawaiian Guide Book* described Kapāpala (noted as Reed's Ranch) as:

...a tract of land bounded by the ocean and the sky, or as high on Mauna Loa as grass can grow, and has an extent of pasture like a pampas in Brazil. At the shore the cattle are tame and form a rich herd; but in the upper forest region they are wild, and are hunted only for their hides. The proprietor [Reed] counts cattle, sheep, goats and acres by the tens of thousands. Here the stranger is sure of a cordial reception, and at this point preparations may be made for the ascent of the 14,000 feet elevation to the summit crater of Mokuaweoweo. (Whitney 1875:93)

Correspondence between Willie, Reed, and Mrs. Jane Reed occurred often—once to twice a week by way of a courier who they affectionately referred to as "butterboy" as it was his task to take several kegs of butter to Hilo along with letters via mule. Although *The Hawaiian Gazette* described Kapāpala as a verdant landscape, Reed and Willie offered a contrasting outlook as they were often excited for rain alluding to the periodic drought conditions. Letters also offered a rare glimpse into the daily events that occurred between all three parties, but especially minute details at the ranch. For example, Mr. Reed shared with his wife how well his stepson and new business partner got along with the ranch hands despite ninety-five percent of the workers being Hawaiian and only speaking their native language. Mrs. Reed did not doubt that her son got along with the workers and shared that one time when Willie was returning to Kapāpala from Hilo, darkness fell and he saw another traveler on horseback ahead on the trail:

He spurred his horse until he came abreast of the stranger and they were soon engaged in Hawaiian conversation. When Willie learned that his traveling companion had a great distance still to go, he invited him to spend the night at the ranch house, an invitation the man accepted gladly. The house was dark, and the first thing Willie did was to strike a light for the lantern in the room. No sooner had he done so than the stranger looked at his host with amazement and then uttered, "E ka haole!"—loosely translated, "Hey, you're a white man!" (Cahill 1996:134)

In addition to handling the ranch's daily operations, the family often hosted numerous visitors who made the trek to the volcano and into Ka'ū. Brief descriptions of visitors taking lunch, coffee, or spending the night at the headquarters (Figure 23) of Kapāpala Ranch fill the newspapers of the late 19th and early 20th century. In June of 1875, British explorer and naturalist, Isabella Lucy Bird wrote of her time at 'Ainapō in Kapāpala and made note of the *koa* forest she had encountered during her trek up the slopes of Mauna Loa:

...I was glad when the cold stars went out one by one, and a red, cloudless dawn brok over the mountain, accompanied by a heavy dew and a morning mist, which soon rolled itself up into rosy folks and disappeared, and there was a legitimate excuse for getting up. Our host provided us with flour, sugar, and doughnuts, and a hot breakfast, and our expedition, comprising two natives who knew not a word of English, Mr. G. [Green] who does not very much more Hawaiian than I do, and myself, started at seven...

We went off, as usual, in single file, the guide first, and Mr. G. last. The track was passably legible for some time, and wound through long grass, and small *koa* trees, mixed with stunted *ohias* and a few common ferns. Half these *koa* trees are dead, and all, both living and dead, have their branches covered with a long hairy lichen, nearly white, making the dead forest in the slight mist look like a wood in England when covered with rime on a fine winter morning. The *koa* tree has a peculiarity of bearing two distinct species of leaves on the same twig, one like a curved willow leaf, the other that of an acacia. (Bird 1875:399-400)

In November of 1875, a letter from Reed to his wife was the first indication that things were not going well at Kapāpala Ranch between Willie and his stepfather. Willie preferred to be in the mountains and travel occasionally, whether it was to visit his mother in Puna or sail to Honolulu. Reed expressed his frustrations to his wife, stating that he preferred for his stepson to be at the ranch every evening instead (Cahill 1996:137). Tensions between the two ebbed and flowed into the next year with Willie writing to his mother in August of 1876 wishing that "he would take my one-third and keep it and pay me wages for the time I have been here" and called himself "foolish" for going into business with his stepfather (Cahill 1996:140). A letter from Reed to his wife also in August of 1876 indicated a possibility of

2. Background

selling the ranch as the ranch, stock, and buildings were all assessed at \$67,200 (Cahill 1996). A letter from Willie to his mother in October of 1876 hinted again at a possible sale stating, “I hope he will not sell the ranch to Rufus [Anderson, an ABCFM executive]” (Cahill 1996:140). In October 1876, Reed sold the ranch lease, livestock, and buildings to Charles R. Bishop for \$75,000 and after two months, Bishop sold the same property in its entirety for \$120,000 to the Hawaiian Agriculture Company (C. Brewer & Co.) to which Bishop and others cofounded (Cahill 1996:141). With a pared-down ranch, Reed had a newfound interest in sugar as he saw the possibility of profits as the Reciprocity Treaty had taken effect and the tax on sugar exported to the U.S. was now removed. Willie also took to growing sugar and with Reed’s other businesses, Kapāpala was no longer of interest to him and the correspondence discussing the ranch also ceased (Cahill 1996).

By 1877, the Hawaiian Agricultural Company had taken ownership of Kapāpala Ranch and they would go on to operate the ranch for another ninety-nine years. The Hawaiian Agricultural Company’s main operations were centered around Pāhala on some 50,000 acres, much of which was owned by the Bishop Estates (Robins et al. 2016). The ranch continued to grow in importance as it provided support, meat, and other supplies to the plantation and its laborers (Elwell and Elwell 2015). Cane was also grown on portions of the ranch, *makai* of the project area below the 3,000-foot elevation, in isolated pockets where soil conditions were most suitable, however, livestock rearing remained at the heart of the ranch’s operations.



Figure 23. Kapāpala Ranch headquarters ca. late 19th or early 20th century (from Kapāpala Ranch website).

In 1894, the Commissioner of Crown Lands, Curtis Iaukea prepared the following description of Kapāpala in which he describes the then owners and land use:

One of the largest lands in Kau. Extends along the coast more than twenty miles, then to summit of the crater on Maunaloa. The road to the Volcano from Punaluu runs across the land. All below that road is very rocky, but above this lies a belt of valuable land now occupied by the Hawaiian Agricultural Co., which has on it a large number of cattle. There is not a very great extent of woodland. Where the Company has a Dairy there is ample water to be found. The land in this neighborhood would make excellent homestead lots as almost all agricultural products will grow well. Fine oats and wheat have been raised there in years past. The nearest landing is Punaluu, distant about ten miles. The rainfall is generally sufficient for all purposes (Iaukea 1894:20).

In the remaining years of the 19th century, Hawai‘i’s agricultural sectors along with the government began to recognize the importance of forests in providing water for household consumption and ranching but more importantly for the irrigation and processing of sugar, which required tremendous amounts of water. The combined effects of drought, forests clearing to make way for sugar fields, the diversion of water, wildfires along with indiscriminate

pasturing were impacting water resources across the islands (Cox 1992). With sugar as the islands' largest economic industry, the government began formalizing a division of government that would oversee Hawai‘i's agricultural industries and forests. This led to the establishment of the Bureau of Agriculture and Forestry in 1892 whose focus was primarily livestock, however, they also implemented programs to work with private landowners to create forest reserves and control wild goats and cattle that were damaging the forests (Walker 1978). By 1903, following the unlawful overthrow of the Kingdom government (in 1893) and the subsequent creation of the Territorial Government (in 1900), the territorial legislature with the influence of plantation owners established the Board of Agriculture and Forestry, which among other duties, called for the employment of a “professional forester” to head the forestry division and provided the legal means to create forest reserves on both private and public lands (Cox 1992:169). In that same year, Ralph S. Hosmer was hired as the first Superintendent of Forestry (Cox 1992).

By June of 1906, upon the urging of the Hawaiian Agricultural Company and the Hutchinson Co. (another large plantation in Ka‘ū) and under the consideration of Hosmer, the Board of Agriculture and Forestry recommended that some 75,000 acres in eastern Ka‘ū be set aside as a forest reserve. An article published in the June 21st, 1903 edition of the *Pacific Commercial Advertiser* describes the Ka‘ū Forest Reserve and makes reference to Kapāpala. That portion of the article reads thusly:

Lying on the lower southern slope of Mauna Loa, bounded on the west and north by the land of Kahuku, on the east by the forest fence erected within the land of Kapapala by the Hawaiian Agricultural Company, and on the south by a line drawn across the various lands back of Pahala and Hutchinson plantations, at approximately the lower edge of the existing forest, and containing an approximate area of 75,000 acres, as recommended by a report of the Superintendent of Forestry, dated March 31, 1906...the boundaries of which proposed reservation more particularly appear by and on a map and description made in May 1906, by the Hawaiian Government Survey Department, which said map is on file in said Survey Department and marked “Registered Map number 2361”...be approved as a forest reserve to be called the Kau Forest Reserve. (The Pacific Commercial Advertiser 1906b:2)

On August 2nd, 1906, Governor George R. Carter, by proclamation officially established the 65,875-acre Ka‘ū Forest Reserve a portion of which encompasses lands in Kapāpala. As noted by *The Pacific Commercial Advertiser*, the reserve:

...comprises 59,618 acres of government land, the balance being the mauka ends of tracts now leased to plantations, but to go into the reserve at the expiration of the leases and now fenced off by the plantation people to preserve the forest growth. Of this reserve, about 33,000 acres will become forest at one, the balance being taken in hereafter from time to time until the whole tract is covered. (The Pacific Commercial Advertiser 1906a:2)

The Hawai‘i Registered Map No. 2631 (mentioned above) prepared in 1905-06 is included below as Figure 24 and shows the project area just outside of the forest reserve’s northeastern boundary. Annotations on the map identify several plant species, (which were used as boundary markers by early surveyors) including ‘ōhi‘a in the lower elevation of the project area and *koa* in the central portion of the project area. Two other territorial survey maps of Kapāpala prepared in 1907 (Figures 25 and 26) provide insight into land use and features in the project area. Notations on the map describe the upper elevations of the project area as having a “thick forest and ferns” and “good soil” whereas the lower section is described as “forest of ferns” with “good soil” and “hilo grass starting in.” Furthermore, the north, south, and east sides of the project area are marked by fencing. The information from these maps indicates that the project area or at least the lower portions were used by the ranch for cattle grazing.

2. Background

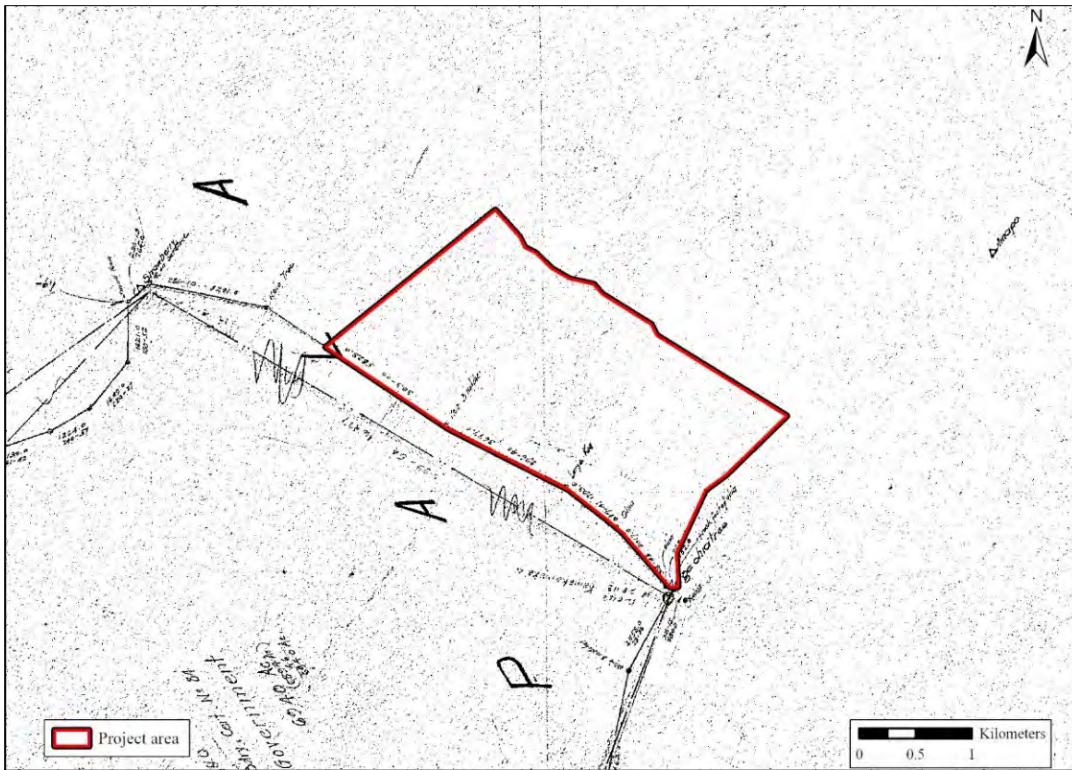


Figure 24. A portion of Hawai'i Registered Map No. 2361 prepared by Geo Wright in 1905-06 shows the project area adjacent to the northeastern boundary of the Ka'ū Forest Reserve.

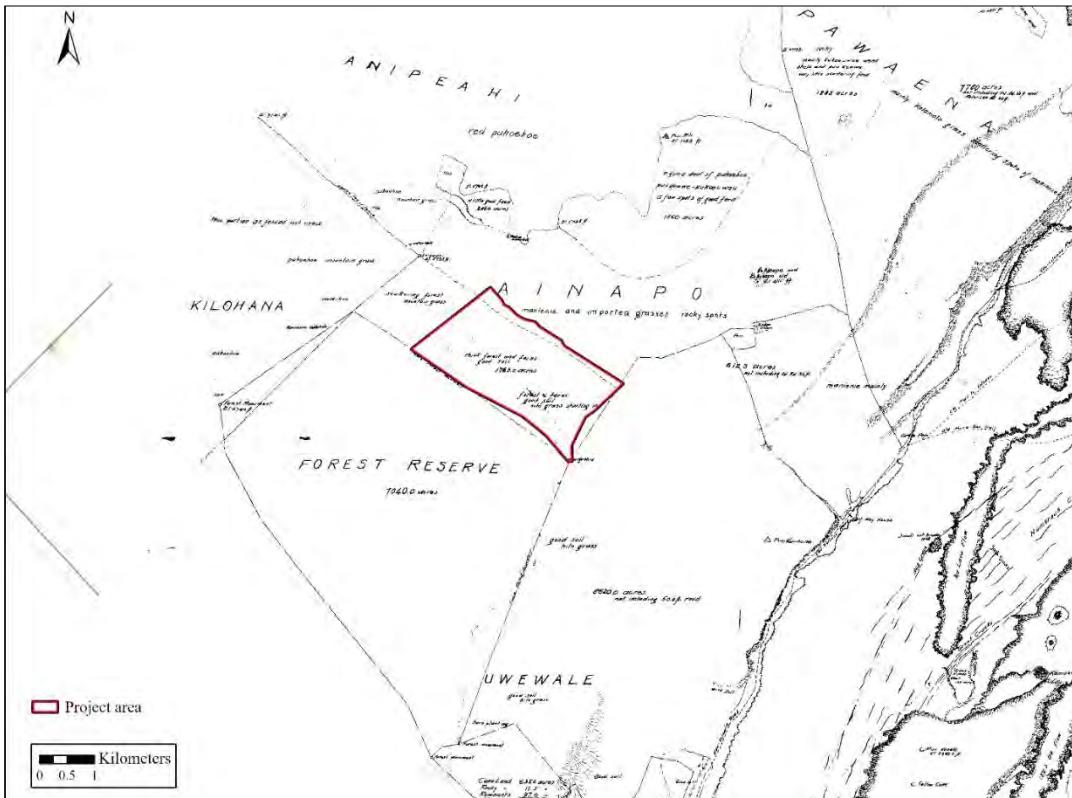


Figure 25. Territorial survey map of Kapapala from 1907 by E.D. Baldwin (From the collection of Lani Petrie at Kapapala Ranch).

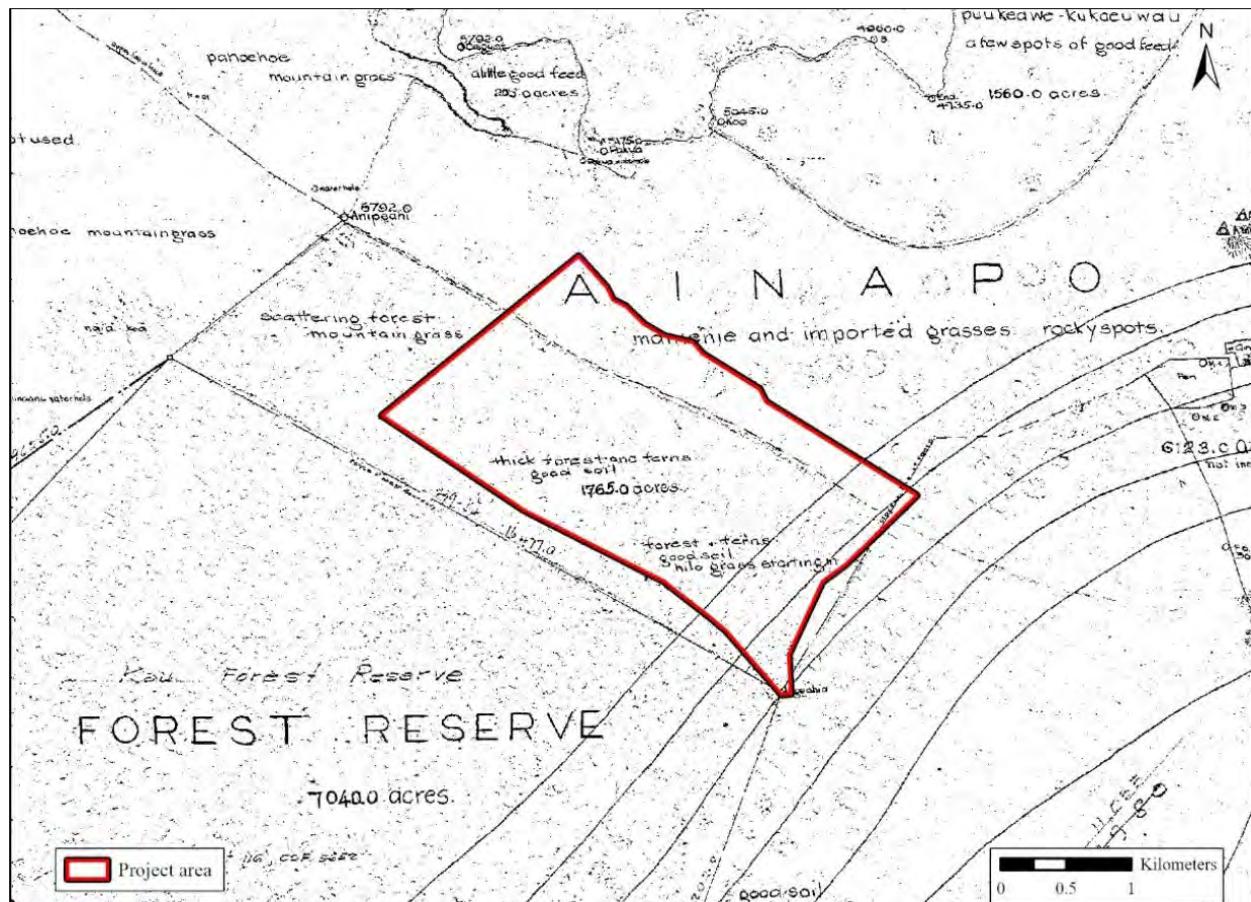


Figure 26. Portion of Hawai'i Registered Map 2388 from 1907 prepared by E.D. Baldwin and Geo F. Wright showing project area adjacent to the Ka'ū Forest Reserve.

When the Hawaiian Agricultural Company took over management of the ranch in 1877, Julian "Mauna Kea" Monsarrat of Honolulu was serving as ranch manager and William Johnson Yates as foreman (the great-great-great-grandfather of the current owner, Lani Cran Petrie) (L.W. 2016). Monsarrat, who arrived at the ranch in September of 1883 was preceded by at least three other managers including Harry "Handsome Harry" Webb, Conrad, and G. Pracht (The Honolulu Advertiser 1923:7). Monsarrat went on to manage Kapāpala Ranch for forty years (until 1923) and during that time he managed about 4,000 head of cattle, improved the ranch's cattle breeds, and began transitioning the ranch from sole dependence upon rainfall to establishing a reliable water supply. He also undertook a forestation and preservation program to help increase rainfall and made the ranch "one of the most profitable operations" of the Hawaiian Agricultural Company (The Honolulu Advertiser 1956:19). Monsarrat lived at the ranch house "Kalanihale" (built around 1860) where he hosted many distinguished guest and "saddle sore" visitors who sometimes mistook the private residence for a hotel (The Honolulu Advertiser 1923:7).

Following Monsarrat's tenure as ranch manager was Bradford "Haole" Sumner who worked there for thirty-four years (until about 1957) (L.W. 2016). Under his oversight, the ranch totaled 75,000 acres from sea level to 6,500 feet in elevation; 40,000 acres of which ranged from good to fair grazing lands. He established a water head source from mountain resources at 3,750 feet and implemented 25 miles of pipelines for the lower pastures as well as installing some 47 miles of fencing for the ranch. Up until the 1920s, the ranch, for the better part of sixty years relied solely on rainfall which meant that the ranch was susceptible to drought and costly operational disruptions. In the 1920s a water tunnel was built which provided a consistent water supply to the ranch (L.W. 2016). The cattle totaled 3,000 Herefords, 40 of them being bulls, and were expected to increase in numbers to 4,000 once the fences were completed. USGS maps from 1921 (Figure 27) and 1924 (Figure 28) show the installation of pipelines throughout the ranch. These maps also identify a "Forest Boundary Trail" traversing in a *mauka-makai* direction along the southwestern boundary of the project area.

2. Background

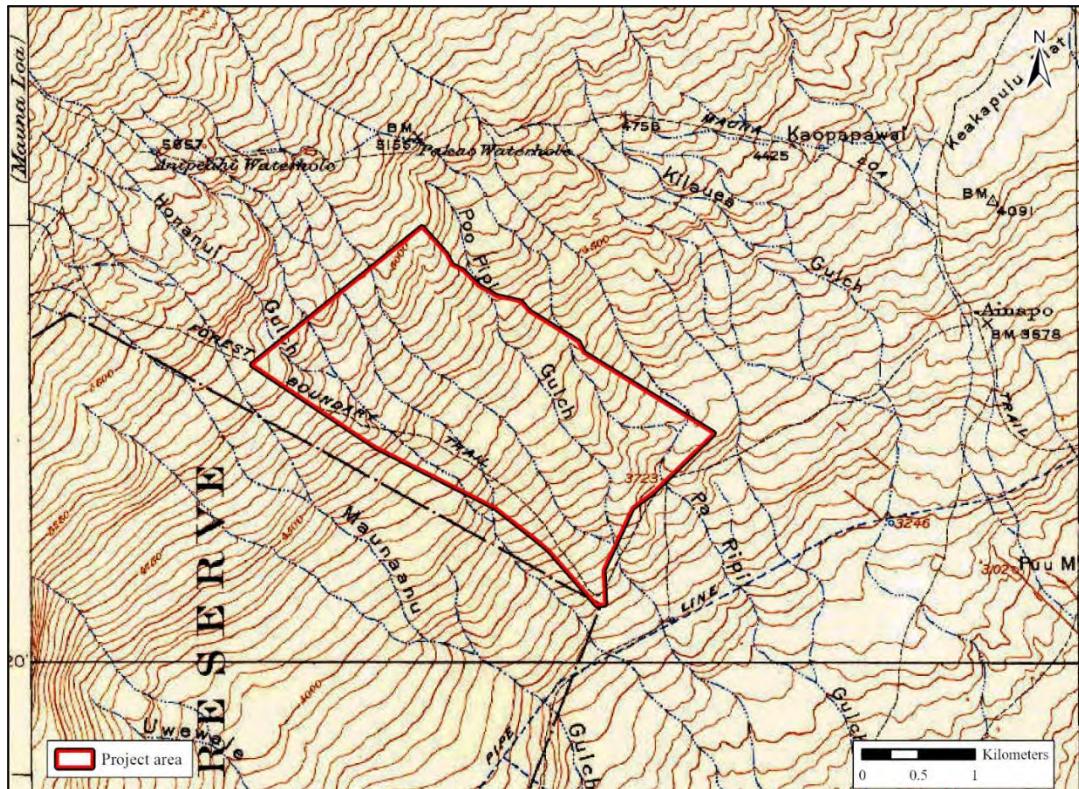


Figure 27. 1921 USGS Kilauea Quadrangle map showing the project area and water pipelines throughout the ranch.

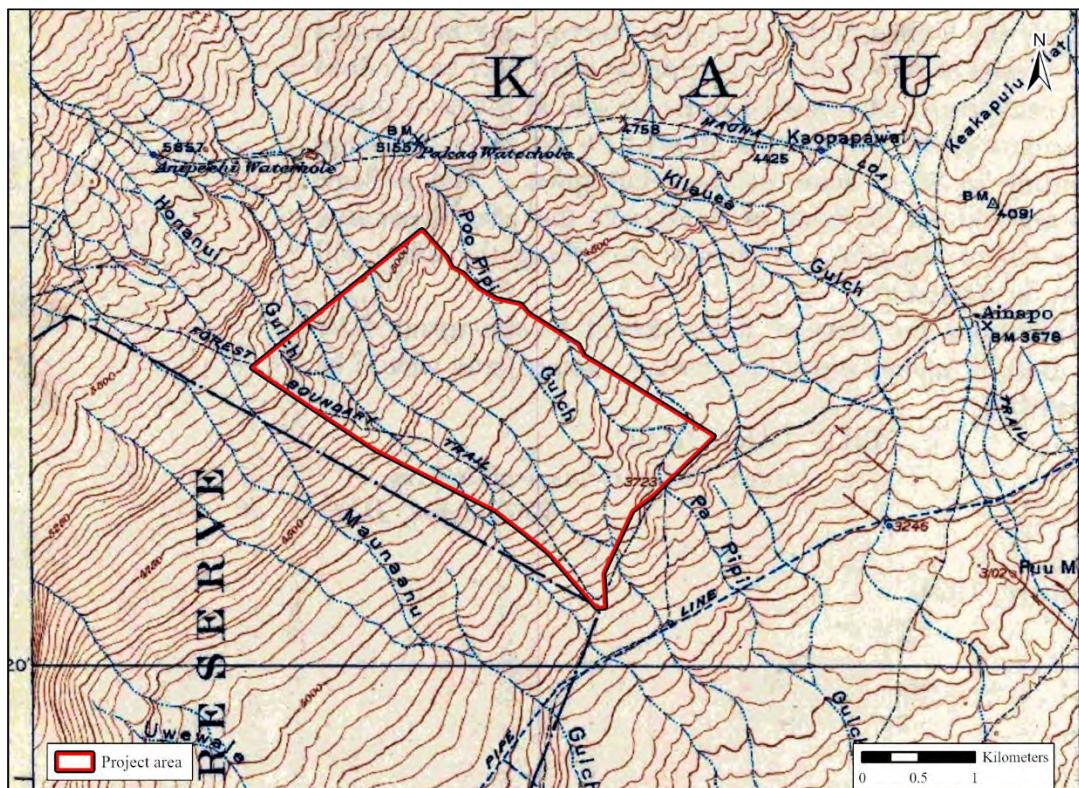


Figure 28. 1924 USGS Kilauea Quadrangle map showing the project area and water pipelines throughout the ranch.

In 1927 the average weight of steers sold from Kapāpala Ranch was 535 pounds, and the ranch marketed around 700 head of cattle aged three to five years. These cattle were marketed in Honolulu and Hilo, either shipped by steamer from Ka‘alu‘alu to Honolulu or by train from Glennwood to Hilo. Aside from the cattle on the ranch, there were also about 250 horses and mules, 10 Percheron mares, and one Kentucky jack for breeding mares for mule production (Henke 1929). Concerning vegetation on the ranch, Henke (1929:36) reported:

On the lower elevations Bermuda grass (*Cynodon dactylon*) and Pili grass (*Andropogon contortus*) are common. *Paspalum dilatatum* is found as low as 500 feet and up to 5,000 feet elevation. Rhodes grass (*Chloris gayana*) does well at 1,000 feet and above. Redtop (*Tricholaena rosea*) and buffalo grass (*Stenotaphrum americanum*) are found to only a slight extent. Kukuyu grass (*Pennisetum clandestinum*) is being tried experimentally and does very well at 2,100 feet and fairly well at 3,000 feet elevation. Other grasses are also under observation for possible future planting. Hilo grass (*Paspalum conjugatum*) is found scattered over various parts of the ranch.

In addition to ranching livestock and growing cane, during the 1930s, some 600 acres, extending from sea level to the 3,000-foot elevation were planted in pigeon peas (*Cajanus indicus*) (Henke 1929). Efforts were also undertaken to improve certain pastures including the planting of *Haole koa* (*Leucaena leucocephala*) and certain grasses including *kikuyu* and *paspalum dilatatum* in the Pu‘ukaunene Paddock located *makai* of the project area (Honolulu Star-Bulletin 1933). On October 17th, 1930, by proclamation of the Governor, Lawernce M. Judd, 37,416 acres of land in Kapāpala extending above the 5,000-feet elevation (adjacent to the *mauka* boundary of the project area) was established as the Kapāpala Forest Reserve (The Honolulu Advertiser 1930). Hawai‘i Registered Map No. 2829 (Figure 29) by Chas L. Murray shows the project area in 1928 and depicts the Ka‘ū Forest Reserve Boundary trail (demarcated by the dashed line) extending along the southwestern boundary of the project area adjacent to the Ka‘ū Forest Reserve. Another map produced by Murray in 1930, Hawai‘i Registered Map No. 2838 (Figure 30), depicts a similar scene with the addition of the Kapāpala Forest Reserve adjacent to the project area’s *mauka* boundary.

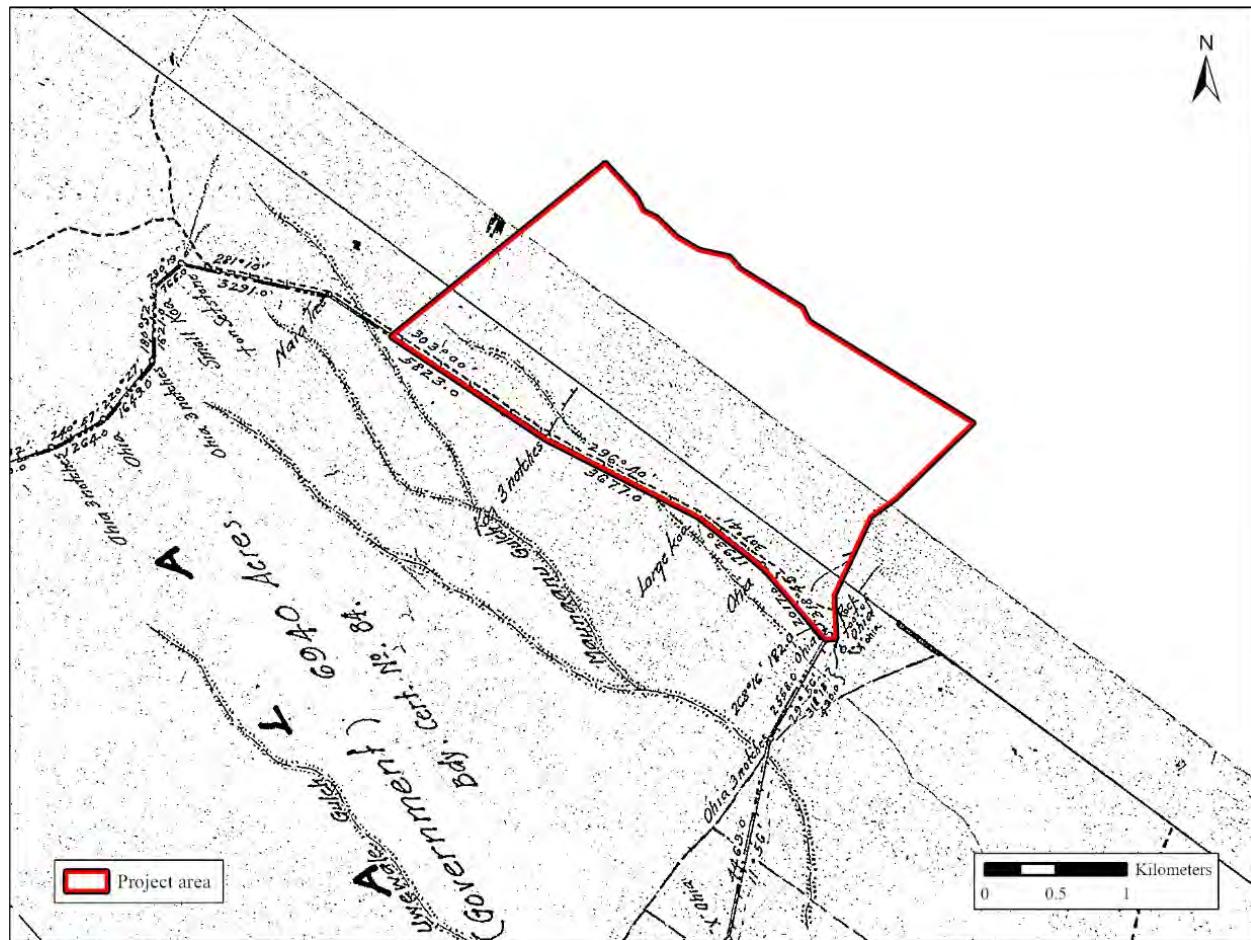


Figure 29. Hawai‘i Registered Map No. 2829 by C. Murray shows the project area in 1928.

2. Background

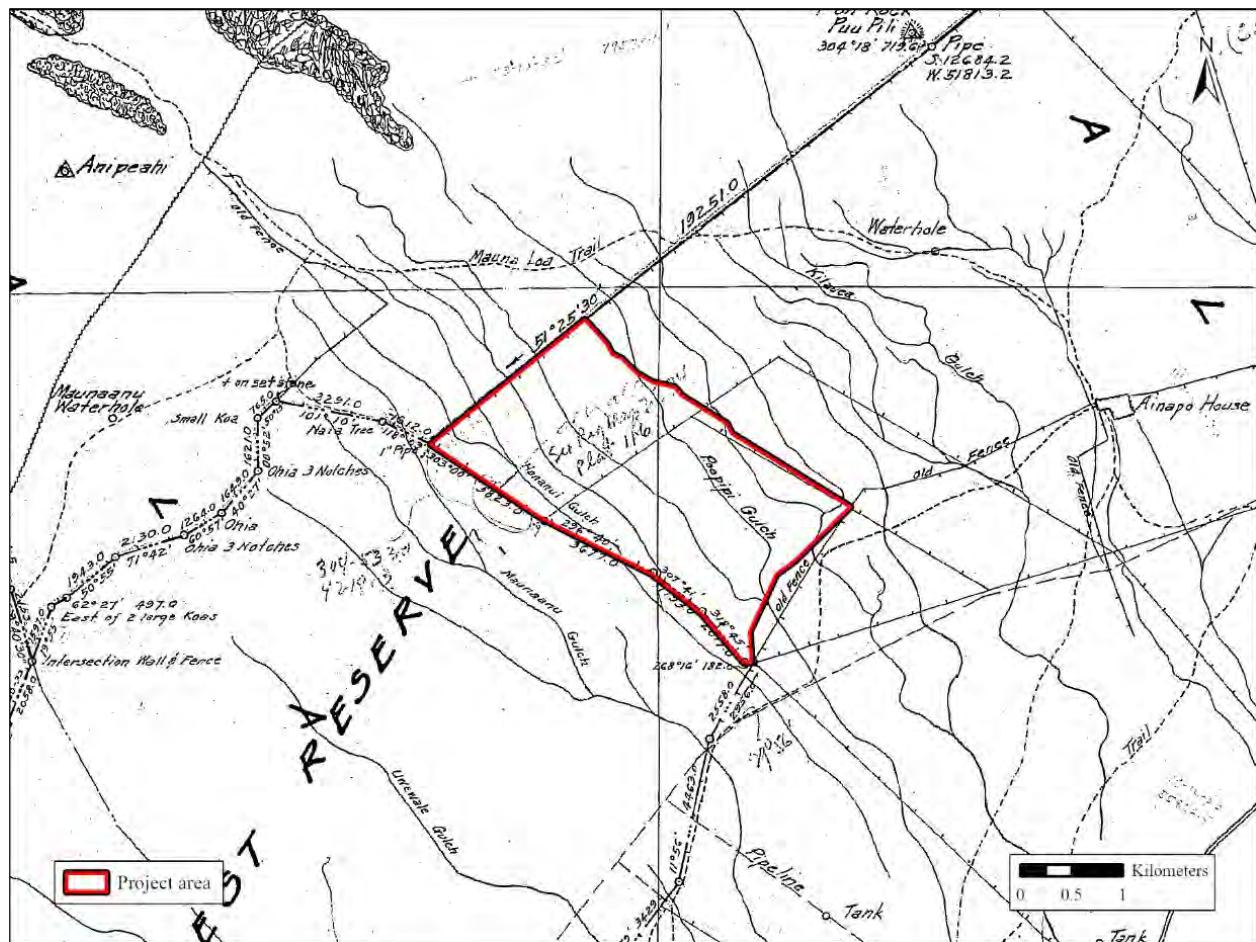


Figure 30. Hawai‘i Registered Map No. 2838 by C. Murray depicts the project area in 1930.

By the 1930s, 1,151 acres comprising much of the central and lower portions of the project area were a part of what the ranch dubbed Yamaoka Paddock No. 1—a name likely associated with a ranch employee or someone who conducted work such as fencing of the area. Whereas the upper portion of the project area was within the Ainapo Mauka Paddock which was comprised of 5,417 acres. The Yamaoka Paddock included two areas, the 1,151-acre Paddock No. 1 and the adjacent 775-acre Paddock No. 2. A map (provided by Lani Petrie at Kapāpala Ranch) prepared by Peter E. Arioli in July of 1930 (Figure 31) shows the project area within a portion of the Yamaoka Paddock No. 1 and the southwestern portion of the Ainapo Mauka Paddock. This map also identifies a waterhole “Koiki Waterhole” within the Ainapo Mauka Paddock just outside of the project area. The boundaries of the Yamaoka Paddock can also be seen in a 1967 USGS map along with the addition of the north-south oriented road that extends across the project area (Figure 32).

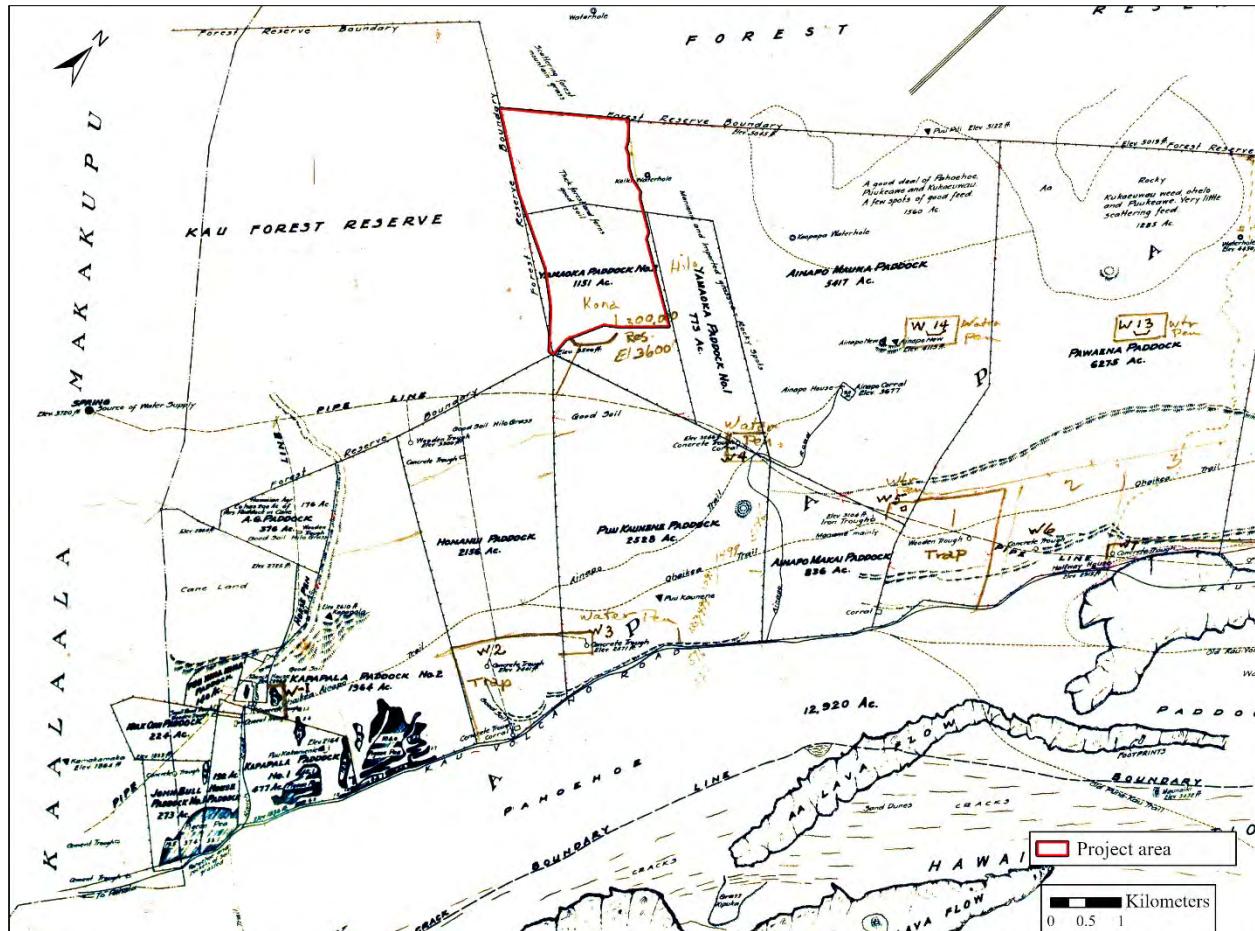


Figure 31. Map titled “A Portion of Kapapala Ranch Kau-Hawaii” prepared by Peter E. Arioli in 1930 shows the project area within a portion of Yamaoka Paddock No. 2.

Following Sumner, as ranch managers were Allan Johnston, Fred Shuttauer, Bob Hunter, Tom Liggett, and Joe Serrao, all of whom managed the ranch for less than ten years during their tenure (L.W. 2016). After Serrao, in 1975, C. Brewer’s (who was looking to withdraw from the livestock business and did not renew their lease with the State), sold the ranch to Parker Ranch. In an effort to keep their feedlot on O‘ahu full, Parker Ranch purchased several of C. Brewer’s interest in Ka‘ū, including three ranches, Keauhou, Kapāpala, and Ka‘alu‘alu. Within a few short months, Parker Ranch, who was operating on a revocable permit issued by the State’s Department of Land and Natural Resources, withdrew its interests from Kapāpala Ranch as it soon realized that the ranch was not profitable due to its sheer size, rugged terrain, and long overdue repairs to fencing. After securing a farm loan, John “Gordon” Cran took over Kapāpala Ranch in 1977 and his name was added to the revocable permit (Loomis 2003; The Honolulu Advertiser 2007). This would be “the greatest test” of his career as he oversaw and managed 30,000 acres along with catching and selling wild cattle, and worked as a laborer, farrier, goat herder, cook, and fence mender (Loomis 2003:1). An aerial photo from 1977 (Figure 33), shows the project area northeast of the Ka‘ū Forest Reserve and within the boundaries of the Yamaoka Paddock No. 1. Also depicted in this photo is the north-south trending road that cuts across the project area. In the area *makai* (southeast) of this road, cattle trails can be seen meandering through the forest.

2. Background

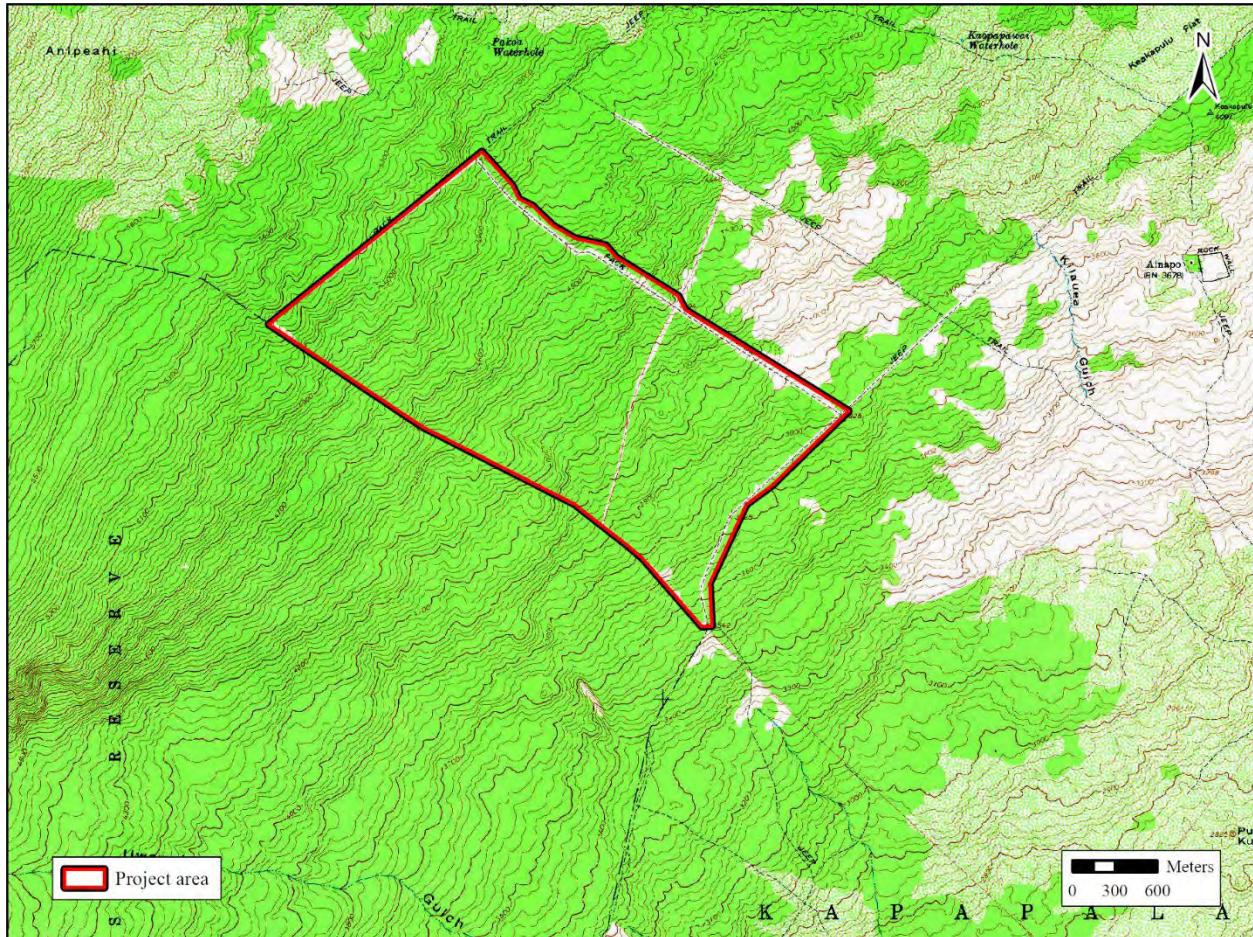


Figure 32. 1967 USGS map showing the project area within the Yamaoka Paddock No. 1 and Ainapo Paddock.

In 1983, a 6.7-magnitude earthquake shook the ranch and within seconds thirty miles of water pipelines were damaged and riddled with 200 breaks (Thompson 2007). Cran was tasked with finding water for 1,500 cattle within twenty-four hours and was aided by a Ka'ū agribusiness that hauled water to the ranch daily. Around 1989, with the support of Cran, the project area was taken out of the ranch's operations and by 2009 was added to the Ka'ū Forest Reserve where it was established as Kapāpala Koa Management Area (Honolulu Star-Bulletin 2009). In the early 1990s, challenges associated with the State's permit renewal process and rent increases made operating the ranch exceptionally difficult. Cran's daughter, Lani Cran, and her husband Bill Petrie worked part-time at the ranch all while holding salaried jobs outside of the ranch. Much of the day-to-day operations were run by Cran and his wife, Genevieve (Bertlemann) Cran. Cran eventually formed a partnership with his wife and daughter, Lani Petrie (L.W. 2016). When Cran died in 2007, the ranch was operated by his wife. Upon her passing in 2016, the ranch passed to Lani and Bill, who now operate Kapāpala Ranch (The Honolulu Advertiser 2007).

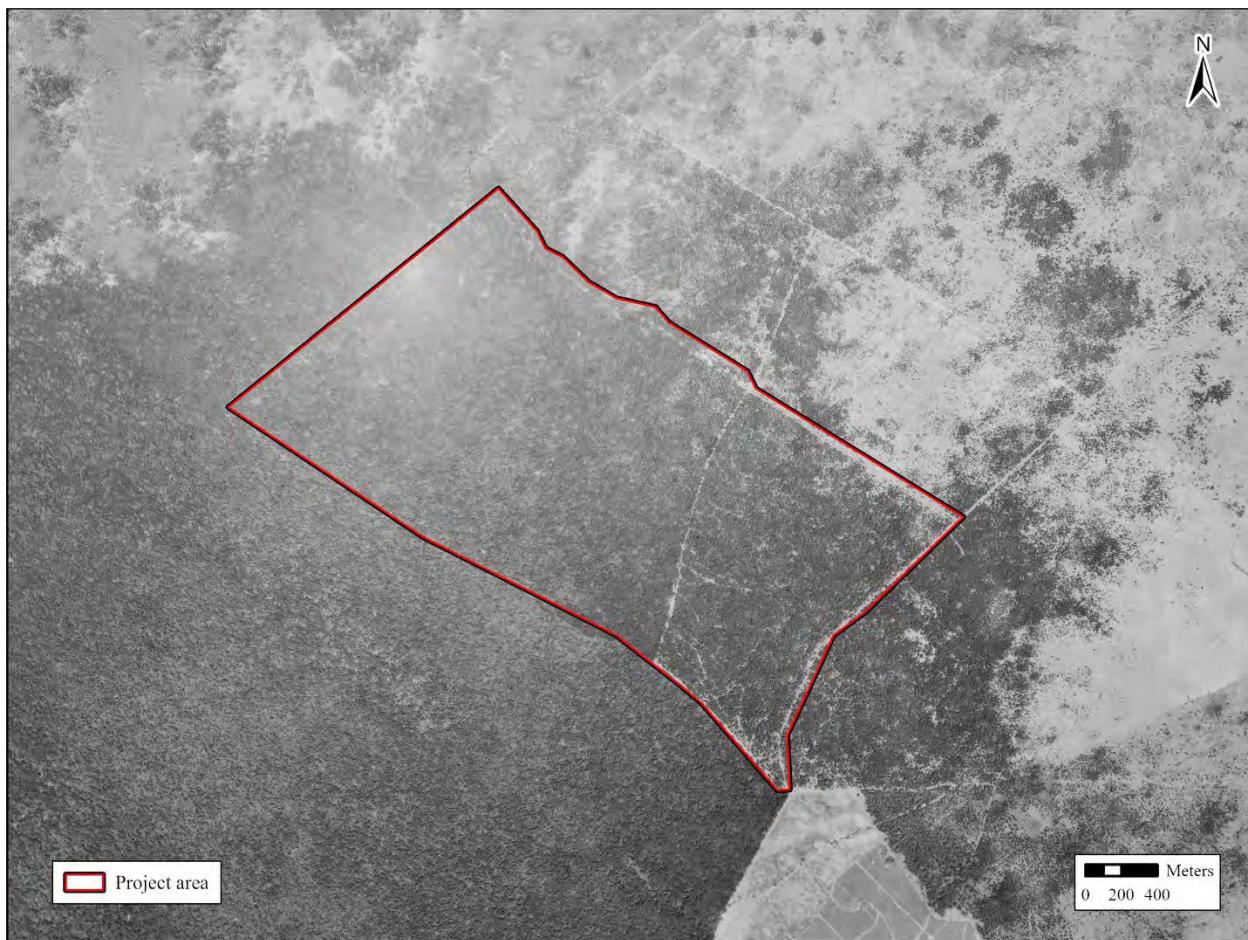


Figure 33. 1977 aerial photo showing the project area within the Yamaoka Paddock No. 1.

PREVIOUS ARCHAEOLOGICAL AND CULTURAL STUDIES IN KAPĀPALA

Archaeological and cultural studies conducted in Kapāpala Ahupua‘a are limited and have largely concentrated *makai* of the project area along Highway 11 and within the Ka‘ū Desert portion of Hawai‘i Volcanoes National Park. One of the most significant sites to be identified in Kapāpala is the 4,284-acre site known as “Footprints” (Site 50-10-61-5505) where some 1,773 human (and animal) footprints have been preserved in the desert ash from the fallout of the 1790 eruption that killed a portion of Keōua’s army. In addition to the footprints that are believed to represent a minimum of 441 individuals, a total of 55 sites comprised of 516 structures and features along with 73 isolated artifacts, roads, and trails were identified (Moniz Nakamura 2003). This site was nominated to the National Register of Historic Places (NRHP) in 1973 and listed on the register in 1974 (Apple 1973a).

Another historic site recorded in Kapāpala includes a portion of the original 34-mile long ‘Ainapō Trail (Site 50-10-50-5501), the upper portion (extending above the 11,600-foot elevation) of which was nominated to the NRHP in 1973 (Apple 1973b). This trail is located to the north-northeast of the project area and extends from 2,000 feet to 13,200 feet elevation. As described by (Apple 1973b:4), “Prehistoric Hawaiians laid out the Ainapo foot trail to assure the availability of shelter, drinking water, and firewood between their nearest permanent settlement, Kapapala village, and Mokuaweoweo...” This foot trail was utilized first by Hawaiians to ascend Mauna Loa, then later by foreign explorers, and was modified after 1870 to accommodate horses and mules. Also associated with this trail are two campsites, “one at the upper edge of the forest (Camp 2) [about the 6,500-foot elevation], and one further upslope with a large lava tube (Camp 3) in the barren area” as well as irregularly spaced *ahu* to mark the trail (Apple 1973b:4). Although the NRHP registry did not include the lower portion of the trail due to the lack of integrity, an 18.2-mile long section of trail is now managed by the Department of Land and Natural Resources-Nā Ala Hele Trail & Access Program as a public recreational trail.

In 2015, ASM Affiliates conducted an archaeological study in compliance with Section 106 of the National Historic Preservation Act for the then-proposed Hawai‘i Electric utility replacement project located along a portion of Highway CIA for the Kapāpala Koa Canoe Management Area, Kapāpala, Ka‘ū, Hawai‘i

3. Consultation

11 (Barna 2017). Six previously recorded sites and ten newly recorded sites were documented. The previously recorded sites included the Peter Lee Road (Site 50-10-52-22997), the Halfway House Trail (Site 50-10-52-23032), the Ke‘āmoku Cross Trail (Site 50-10-52-23033), the Ka‘ū-Volcano Road (Site 50-10-52-23034), Lithic Block Quarry Features (Site 50-10-52-23467), and a Historic rubbish incinerator (Site 50-10-52-23794). The newly recorded features include three Historic borrow pit complexes (Sites 50-10-52-30275, -30278, and -30284), a Precontact/ early Historic trail (Site 50-10-52-30276), a Historic telephone pole alignment (Site 50-10-52-30277), a Historic scatter of ceramic fragments (Site 50-10-52-30279), the former Ka‘ū park entrance sign base (Site 50-10-52-30280), an L-shaped alignment (Site 50-10-52-30281), a portion of the Uwekahuna-Bird Park Road Trace and an associated culvert (Site 50-10-52-30282) and a Historic steam bath house foundation (Site 50-10-52-30283). All of the sites were avoided during the utility removal and installation, thus Barna (2017) concluded that the project would have no effect on historic properties.

In 2012 on behalf of the Department of Land and Natural Resources, Ke Ala Pono, an archaeological consulting firm prepared a CIA for the Ka‘ū Forest Reserve. As part of this study, Uyeoka et al. (2012) compiled cultural historical background information including traditional *mo‘olelo*, *mele*, and historic accounts and reviewed mid-19th century *Māhele* documents, historical maps, and summarized prior archaeological studies conducted in the uplands of Ka‘ū. They also undertook an ethnographic survey with sixteen individuals, who were either *kama‘āina*, agencies, and groups that were “recognized as having a cultural, historical, genealogical, or managerial connection to the forest reserve” (Uyeoka et al. 2012:5). From the ethnographic interviews and historical sources cited throughout their study, Uyeoka et al. (2012:151) found that “...the forested *mauka* regions of the Ka‘ū Forest Reserve were commonly used for specialized resource procurement activities...” that “...were likely centralized in specific area that contained important resources for catching/collecting birds, harvesting hardwoods for crafts and other uses, collecting medicinal plants, and spiritual practices.” They added that cultural practices continue to be perpetuated within the Ka‘ū Forest Reserve including the gathering of plant resources, gathering of *wai* from springs for ceremonial purposes, and hunting for subsistence purposes. Uyeoka et al. (2012:151) ultimately concluded that DOFAW’s proposed activities “...should have little impact on the known cultural, resources, and beliefs...” and that several of the activities “have the potential to benefit the cultural resources of the Reserve.” To mitigate the potential impacts and community concerns specifically lifestyles changes, restricted access, and watershed management, Uyeoka et al. (2012) conveyed the importance of maintaining the Ka‘ū way of life, ensuring continued and increased access into the forest reserve to allow for continued subsistence and gathering activities, and protection of the watershed through ungulate removal, invasive species control, and propagating native plants.

3. CONSULTATION

Gathering input from community members with genealogical ties and long-standing residency or relationships to the project area is vital to the process of assessing potential cultural impacts on resources, practices, and beliefs. It is precisely these individuals that ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and in-depth understanding that are unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC (1997) *Guidelines for Assessing Cultural Impacts*, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area. It is the present authors’ further contention that oral interviews should also be used to augment the process of assessing the significance of any identified traditional cultural properties and informing the recommendations. Thus, it is the researcher’s responsibility to use the gathered information to identify and describe potential cultural impacts and propose appropriate mitigation as necessary. This section of the report begins with a description of the level of effort undertaken to identify persons believed to have knowledge of past land use, history, or cultural information specific to Kapāpala or the practice of *kālaiwa‘a*. This is followed by the consultation methodology and concludes with a presentation of the interview summaries that have been reviewed and approved by the consulted parties.

OUTREACH EFFORTS

In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with the current project and study area, a public notice containing (a) locational information about the project area, (b) a description of the proposed project, and (c) contact information was printed in a newspaper with state-wide readership. The public notice was submitted to the Office of Hawaiian Affairs (OHA) on October 1, 2022, for publication in their monthly newspaper, *Ka Wai Ola*. This notice was published in the November edition of *Ka Wai Ola* and a copy of the public notice is included in Appendix A of this report. From the public notice, no responses were received.

Furthermore, in 2015, DLNR-DOFAW assembled a working group comprised of key stakeholders including *kūpuna* and residents of Ka‘ū, canoe clubs and associations, cultural practitioners, canoe builders, conservationists, and adjacent landowners. A full list of the members who were invited to the Working Group is provided below in Table 4.

Table 4. Members of the Working Group.

<i>Name</i>	<i>Affiliation</i>
Aileen Yeh	Hawaii Agriculture Research Center
Aku Hauani‘o	Canoe Builder
Andy Cullison	DOFAW
Aviva Gottesman	Forest Solutions
Bill Rosehill	Canoe Builder
Bobby Puakea	Canoe Carver, Puakea Foundation
Colleen Cole	Three Mountain Alliance
Darlyne Vierra	<i>Kama ‘āina</i> of Ka‘ū
David Smith	DOFAW
Doug Bumatay	Canoe Carver, President of the Moku O Hawai‘i Outrigger Canoe Racing Association
Elias Nakahara	Hawaiian Canoe Racing Association
Gary Puniwai	Canoe Builder/Repairer/Paddler
Hovey Lambert	Canoe Carver/Puakea Foundation
Irene Sprecher	Forest Solutions
Jan Pali	DOFAW
Jay Hatayama	DOFAW
Jerome Mauhili	Paddler, Moku O Hawai‘i Outrigger Canoe Racing Association
John Repogle	<i>Kama ‘āina</i> of Ka‘ū, Retired from The Nature Conservancy
Jonathan Grayson	Hawaiian Canoe Racing Association
Ka‘ili Mo‘ikeha	Hawaiian Canoe Racing Association
Katie Kamelamela	Ethnoecologist/ Akaka Foundation
Keahi Warfield	Moku O Hawai‘i Outrigger Canoe Racing Association
Keola Dayton	Hawaiian Canoe Racing Association
Keri Mehling	Hawaiian Canoe Racing Association
Lani Petrie	Kapāpala Ranch
Luana Froiseth	Hawaiian Canoe Racing Association
Mike Atwood	Hawaiian Canoe Racing Association
Mike O‘Shaughnessy	Moku O Hawai‘i Outrigger Canoe Racing Association
Nick Koch	Paniolo Tonewoods/Formerly with Forest Solutions
Nohea Ka‘awa	<i>Kama ‘āina</i> of Ka‘ū, The Nature Conservancy
Riley De Mattos	DOFAW
Samantha Moikeha	Hawaiian Canoe Racing Association

Since its inception, the Working Group—whose goals are to provide direction and guide decisions on the management of the KKCFMA and the sustainable use of its natural and cultural resources—has met anywhere between once to three times a year except for the years 2019 and 2020 (Table 5). Furthermore, not every member of the Working Group participated in each meeting and likely because of the long duration of the project, some group members went inactive. However, at each meeting there was representation by some members of the Working Group. At the last meeting held on November 17, 2022, the Working Group requested that the preparers of the CIA review all past meeting notes for information that is relevant to this CIA study and include that information in the analysis. Also, the Working Group felt that most of the people that would likely participate in the CIA or be sought out by the preparers of the CIA were already included in the Working Group and had shared their knowledge or recommendations in prior meetings. In light of this request, the authors of this study obtained, with the assistance of Forest Solutions and DLNR-DOFAW staff, all Working Group meetings notes from the following dates, which are tabulated chronologically by year (see Table 5). Rather than reproduce transcripts of the meeting notes (which are available through Forest Solutions and DLNR-DOFAW), the following section presents those relevant themes that emerged from the meeting notes.

3. Consultation

Table 5. Dates of Working Group meetings.

2015	2016	2017	2018	2021	2022
September 18	January 9 July 31 November 5	July 9	January 18 December 7	April 8	September 22 November 17

Lastly, ASM staff contacted the following individuals, listed in Table 6 via phone and or email. These individuals were identified as persons who were long-time residents of the area and were believed to have knowledge of past land use, history, or cultural information specific to Kapāpala or the practice of *kālaiwa‘a*. Each of the persons contacted was provided with a consultation packet that contained maps of the project area, a description of the proposed project, and the proposed activities. Of the sixteen people/organization contacted, eight—Doug Bumatay, Lani Petrie, Dale and Jody Fergestrom, Bobby Puakea, John Repogle, Jessie Ke, and Katie Kamelamela, PH.D.—agreed to be interviewed for this study. Of the eight interviews conducted, seven were able to review and approve their interview summaries; all of which are included below.

Table 6. Persons and organizations contacted for consultation.

Name	Affiliation	Result of Contact	Contact Date	Notes
Doug Bumatay	Canoe Carver/President of the Moku O Hawai‘i Outrigger Canoe Racing Association/ member of the Working Group	Interviewed	7/15/2022	See summary below
Bobby Camara	Retired from the Hawai‘i Volcanoes National Park	Provided referrals	7/14/2022	Recommended outreach to Bill and Lani Petrie, Dale Fergestrom, Edith Kanaka‘ole Foundation, Aku Hauani‘o, Kalani Nakoa at Na Pe‘a, Kekaulua ‘Ohana, Doug Bumatay.
Lani Petrie	Kapāpala Ranch owners/ member of the Working Group	Interviewed	10/14/2022	See summary below.
Dale and Jody Fergestrom	Director and Nā Pe‘a Instructor	Interviewed	n/a	Invited by Lani Petrie to interview held on October 25, 2022. See summary below.
Jerome Mauhili	Moku O Hawai‘i Outrigger Canoe Racing Association/Kailana Canoe Club/ member of the Working Group	No response	10/14/2022	n/a
Bobby Puakea	Carver/ Puakea Foundation/ member of the Working Group	Declined interview	11/29/2022	n/a
Kalā Mossman	Edith Kanaka‘ole Foundation	Interviewed	11/29/2022	See summary below.
Kalani Nakoa	Nā Pe‘a/Nakoa Foundation	No response	11/29/2022	n/a
Nohea Ka‘awa	<i>kama‘āina</i> of Ka‘ū/ member of the Working Group	No response	11/29/2022	n/a
John Repogle	<i>kama‘āina</i> of Ka‘ū/ member of the Working Group	Interviewed	11/29/2022	See summary below.

Table 6 continues on next page.

Table 6. continued.

Name	Affiliation	Result of Contact	Contact Date	Notes
Sophia Hanoa Office of Hawaiian Affairs	<i>kama 'āina</i> of Ka'ū/ Ka'ū Kupuna Council Office of Hawaiian Affairs	Provided referral No response	11/18/2022 8/5/2022	Recommended outreach to Kupuna Jessie Ke. n/a
Gary Puniwai	Canoe carver/ member of the working group	No response	10/14/2022	n/a
Chad Paison	Senior Captain Nā Kālai Wa'a	No response	11/29/2022	n/a
Jessie Ke	Ka'ū Kupuna Council	Interviewed	11/21/2022	Could not get in touch with Kupuna Ke to approve interview summary.
Katie Kamehamela, Ph.D.	Ethnologist	Interviewed	12/5/2022	See summary below.

End of Table 6.

CONSULTATION METHODOLOGY

Prior to the interview, ASM staff provided information about the nature and location of the proposed project and informed the potential interviewees about the current study. The potential interviewees were informed that participation was completely voluntary and that they could withdraw from participation at any time. Furthermore, if they agreed to be interviewed they would be asked to review their interview summary prior to inclusion in this report to verify the information for accuracy, tone, and content. Upon their consent, ASM staff then asked questions about their background, their knowledge of past land use, and the history of the project area, as well as their knowledge of any past or ongoing cultural practices or valued resources. Where necessary, ASM staff also asked follow-up questions to gain clarity on certain information shared by the consultees. The informants were also invited to share their thoughts on the proposed KKCMA project and offer mitigative solutions. The interviews were informal, that is they were done in casual settings at locations specified by the interviewees and were more conversational in style. Below are the interview summaries that have been reviewed and approved by the consulted parties.

SUMMARY OF WORKING GROUP MEETING NOTES

To fulfill the request made by the Working Group, ASM staff carefully reviewed all available notes from the prior meetings (see Table 4). The meeting notes contained a variety of information specific to the KKCMA project including general project updates, extensive discussion about the log allocation/application process, thoughts and concerns about the harvesting process, statistical information about canoe clubs and number of paddlers, project schedule, and outline of EA components. Also, tucked within these discussion were comments and information on past and ongoing cultural practices, valued resources, cultural beliefs associated with the forest, and a variety of recommended mitigative actions to limit impacts to the forest resources and improve management of the KKCMA. Presented below are those broad themes that emerged from the Working Group meeting notes. It is recognized that some of the comments/recommendations can be applied to one or more themes.

Cultural Beliefs and Protocols

- Forest is sacred. (September 18, 2015)
- Forest are living and removal of trees is not the end of the forest. (September 18, 2015)
- Cultural protocol for those groups/organization outside of Hawai'i Island. (July 31, 2016)
- Develop appropriate cultural protocol for tree selection, harvesting, and carving. A general protocol developed for entering the KKCMA. (November 5, 2016)
- Groups receiving logs should be involved in visiting the forest before harvest and establishing a cultural connection with the forest. (November 17, 2022)

Cultural Resources and Practices

- Trails located in the KKCMA forest. (January 9, 2016)
- Maile gathering occurs in the KKCMA. (July 9, 2017)
- Forest bird resources located in the KKCMA include 'apapane, 'amakihi, 'elepaio, 'i'iwi, and 'ōma'o. (December 7, 2018)
- Native species: 'apapane (most abundant), Hawaii 'amakihi (also abundant), 'ōma'o, 'i'iwi, 'alawī, Hawaii 'elepaio, akiapolaau, 'io (April 8, 2021)
- *Koa* volume average 1-2 *koa* trees per plot. 5.4-5.5M board feet of *koa* in the forest. Most of the volume is being stored in *mauka* sections of reserve. Probably because of past harvesting, grazing, land use etc. Most of the volume in the 40-50" diameter trees. The oldest logs are the highest elevation logs. (April 8, 2021)
- We have limited resources on Hawaii island. Only 5 guys who can move a log, bring it down. Backwards engineering this within the group would help. Context is helpful. Ideal cultural practices and practical cultural practices with safety in mind. This is a part we need to put more time in for safety and partnership. (November 17, 2022)

Balancing Science and Culture

- Would like to see a balance between the culture and science when reviewing what trees will be selected. (November 5, 2016)

Utilizing Existing Infrastructure and Invasive Species/Disease Control

- Utilize and improve the existing wood platform located in the KKCMA by adding a roof which can be used as a gathering space for groups visiting the forest. This space can be utilized by groups that can assist with road maintenance, outplanting efforts, seed collection, weed control, watershed education, or similar activities. (September 18, 2015)
- Cautioned against constructing new roads in the forest as roads facilitate the introduction of invasive species. Use existing roads during harvesting operations. (January 9, 2016)
- Public presence will have a big impact on spread of invasives.
- Pretty sure there is ROD near the bottom left corner [of KKCMA], however, 'ōhi'a in plots look generally very healthy. (November 17, 2022)

Harvesting and Extraction

- Logs must be extracted properly to prevent damage to forest resources. (September 18, 2015)
- Ensure there will be logs available for future generations. (September 18, 2015)
- Want to ensure a variety of tree sizes are removed and not only large trees otherwise there will not be any big trees left in the forest. (September 18, 2015)
- Carvers should be present when the tree is extracted from the forest. (September 18, 2015)
- Management plan should allow for the hand collection of *koa* logs for cultural and spiritual purposes. (September 18, 2015)
- Logs extracted from the KKCMA should not be sold and there should be close tracking of the log to ensure they are utilized for canoes. (September 18, 2015)
- There are limited number of carvers, this only a limited number of logs can be extracted annually. (September 18, 2015)
- Harvesting of *koa* will help create space in the forest which would prompt tree to grow tall and straight which are more suitable for canoes. (January 9, 2016)
- Anticipate some destruction to native habitat during the harvesting process which could be mitigated by reforesting disturbed areas. (January 9, 2016)
- Skidding logs out of the forest to the closest road will have less of an impact and skid trails will eventually help regenerate more *koa* seedlings. Skid trails can also be reused to limit impacts to the forest. Explore alternative harvesting methods to reduce impacts. (January 9, 2016)

- Ensure logs extracted from the KKCMA are used appropriately and for the same reason it was harvested. Extra *koa* should not be sold by the club to fund the construction of the canoe. (January 9, 2016)
- Auxillary harvest can be used for other parts of the canoe or paddles. (January 9, 2016)
- Do not want to reenter harvested area and damage any seedlings. (November 5, 2016)
- Some clubs are mostly about paddling and competition. Other clubs are all about culture, with paddling being but one aspect of the culture. Consideration during log allocation, the role of culture in the activities of the club and perpetuation of the cultural values. (July 31, 2016)
- Ensure harvesting period considers weather and seasonality of bird populations (nesting in spring). (July 9, 2017)
- Consider machines creating disturbances which create opportunities for both natives and weeds (November 17, 2022)
- We should have plots and take everything (mature *koa* logs, dead *koa* logs, decadent (high risk) *koa*/'ōhi'a trees/logs, and felled logs; young healthy *koa* trees and healthy 'ōhi'a trees to remain along with islands of existing native vegetation) from an area at one time then let that area rest. If we harvest, we will get regeneration and we should not go back to that area with machinery and disturb the native regeneration. (November 17, 2022)
- Downed logs should be considered before living trees for carving. (November 17, 2022)
- A lot of discussion on how to track logs, takes a while to cure, how to keep track? (November 17, 2022)

Education and Stewardship

- The KKCMA can serve as a good educational resource. (September 18, 2015)
- Hunters need to be made aware of the plan and notified when there are activities in the forest. (January 9, 2016)
- Involving club who utilize a log from the KKCMA in stewardship activites. (July 31, 2016)
- Community stewardship inclusive of HCRA members can assist with outplanting. (November 5, 2016)
- Invoinving young upcoming carvers. (January 18, 2018)
- Group has been talking about having more information about the area available to people visiting the site – many have no idea what this area is or that it is set aside for *koa* canoe logs or *koa* sustainability (November 17, 2022)
- HCRA History Committee has offered to document and publish each of the builds (photographically and orally) and they would host that for the club participating in the process. Hope that this becomes a model. (November 17, 2022)

Reciprocation

- What is being reciprocated to the forest when a *koa* is extracted? (September 18, 2015)
- Give back to the Ka'ū community, perhaps a log can be used for fishermen or a school to build a canoe. (September 18, 2015)
- There must be some giveback by those who receive a log from the KKCMA. Canoe clubs receiving logs from the KKCMA can help with reforestation efforts. (January 9, 2016)

Sustainable Funding

- Identify funding resource to help sustain the management of the KKCMA. (September 18, 2015)
- Auxillary harvest can be sold to raise funds for the KKCMA. (January 9, 2016)
- Seek funding (i.e. grants) to help support and sustain the KKCMA management activities. (November 5, 2016)

Declining Health of Native Forest and Conservation Strategies

- Incorporate both natural regeneration of seedlings and outplant to encourage growth of canoe quality logs. (November 5, 2016)
- Native forest is not regenerating on its own. Many native forest lack an understory of young trees that would regenerate the forest. (July 9, 2017)

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- Fencing and public education is necessary. (July 9, 2017)
- Suggestions for Future Management: Creation of a long-term harvest plan, preserve forest for Hawaiian cultural practices, increase diverse public access opportunities, maintain & enhance the health of the native forest. (November 17, 2022)

DOUGLAS ‘DOUG’ BUMATAY

On August 31, 2022, ASM staff Lokelani Brandt conducted an in-person interview with Mr. Douglas “Doug” Bumatay at the Paddlers of Laka’s *hālau wa‘a* at Hilo Bayfront to discuss the proposed project and scope of the current CIA. Doug comes from a long lineage of *koa* canoe carvers and paddlers—a legacy that was passed down to him by his father, the late, Mr. Raymond “Ray” Bumatay. Doug and his sister, Pua Kalani‘ōpio are the Head Coaches for Paddlers of Laka, a Hilo-based canoe club and he currently serves as President of the Moku O Hawai‘i Outrigger Canoe Racing Association. Much of the information shared during this interview focused on Doug’s background with the Moku O Hawai‘i Outrigger Canoe Racing Association, his family’s *koa* canoe carving legacy, the canoe carving community, the types of canoes and what they are utilized for, and the role of *koa* canoes in Hawaiian culture.

Doug was born July 28, 1971, into a long heritage of canoe paddling and carving. Doug shared that at around age two, his parents helped establish the first Moku O Hawai‘i Canoe Association, and shortly thereafter, his father, Ray, founded Wailani Canoe Club (known today as Kailana Canoe Club). A year after the club’s establishment, around age three, Doug recalled his father, Ray acquiring his first *koa* log from Kona—the log from which his dad built his first *koa* canoe. This would be Doug’s first memory of canoe carving with his father. He remembered being around three years old and handing his dad various carving tools and raking up saw dust around the workshop.

When asked how his father, Ray acquired the knowledge of canoe carving, Doug shared that when his father was young, he watched his grandfather build the canoes in Kalapana. He added that his father, Ray was born in ‘Opihikao but was raised in Kalapana and later moved to Hilo. As Doug’s father got older, the desire to carve his own *koa* canoe grew. Finally, one day his father, decided to talk with his mother (Jenny Kama), about his grandfather’s work and gather as much information about his grandfather’s canoe carving process. Since acquiring that first *koa* log, canoe carving was a passion of Doug’s father, and he became known as the “canoe builder.” Doug shared that his dad taught both himself and his brother Alika the process of canoe carving. He elaborated that the process he follows today, though the techniques have been refined, is the same process handed down from his father.

Having grown up in this practice, Doug laughingly shared that he always assumed every family participated in canoe carving. However, it wasn’t until he was in high school—as more and more people came up to him asking about his father and canoe carving—did he begin to realize the uniqueness of his upbringing, the significance of his father, and their family practice. Doug added that because there are so few people who hold this knowledge, it is vital for him to continue to perpetuate his father’s legacy. He related that about twenty years ago, Uncle Manny Veincent of Kawaihae Canoe Club encouraged him to start his own club. Doug added that at that time, he pondered deeply on whether to focus on canoe building and repairing or the paddling aspect, but in the end, Doug chose to perpetuate both.

When asked if he could share about the tree selection process, Doug clarified that when his father built his first canoe around 1974, he was very young and could not speak to the tree selection process or the coordination with the landowner. However, Doug did recall that this canoe was built from a standing tree. Doug shared that about 1979, there was a coordinated project to get *koa* logs from Kona to different canoe clubs. He was not sure about the log selection or the distribution process, however, he recalled that twenty-nine logs were harvested and taken down to Kawaihae to be shipped; of the twenty-nine logs, three were kept here on Hawai‘i Island the rest were shipped to O‘ahu. Doug recalled during the log allocation process, his father trying to make his selection but was told that the logs he had chosen were already allocated. Annoyed at not being able to obtain the logs he had selected, Doug’s father, instructed “Doug, crawl under there [the trailer] an pick us one log.” Doug related that he selected two logs that turned out to be some of the better logs for canoes and that some of the logs that were shipped to O‘ahu were later found to be rotten. Furthermore, from that batch of twenty-nine logs, one was used to build Laka, the *koa* racing canoe of Paddlers of Laka that is still in use today. He shared that the log from which Laka was built was a log that no one wanted because it was smaller and contained a big hole with rot. He described how this log was kept at Bayfront for about six months before his dad was approached to negotiate the purchase of the log. After his father purchased the log, the initial shaping took place at the beach after which they were able to transport the semi-hewn canoe to their home for finishing.

In sharing more about the tree selection process, Doug elaborated that for the most part, he has not had the opportunity to pick standing trees rather he often harvests trees that have already fallen over. Thus, he harvests more on a salvage basis and works directly with the landowner to discuss the harvesting process and to negotiate the price of a

log. Doug related that depending on the preference of the landowner, he has utilized heavy machinery to harvest, and sometimes, he has had to take a more manual approach to remove the tree from the forest.

When asked what he looks for when selecting a tree, Doug shared that a suitable length and diameter are the two most important factors. If the log is too small, it takes a lot of work to build it up and you don't necessarily want a log that is too big. However, even with bigger trees, any excess wood can be repurposed and used in the construction of another canoe. He added that most of the time after the tree is cut down, it is hauled out of the forest and taken to the workshop. In addition to a suitable length and diameter, he expressed that the most preferred trees are those that grow straight and noted that most of the *koa* found in the forests don't typically grow in that manner.

When asked about rituals or ceremonies that practitioners do in obtaining a log, Doug expressed that traditionally, ceremonies were held, however, few practitioners continue this aspect of the process, including himself. Furthermore, this aspect of the process has been neglected because there are so few opportunities for carvers to go into the forest and select trees to cut. Doug reiterated that most of the carvers today work on logs that are fallen and salvaged.

Concerning the preferred locations of where *koa* logs are harvested from, Doug jokingly shared that wherever the "big enough" logs are, is where one would harvest from. He mentioned that Kapāpala has the potential to be a good harvesting spot and recalled that the forest of South Kona has likely supplied the most *koa* canoe logs.

Concerning the types of canoes that were built, Doug shared that traditionally, *koa* racing canoes as it is practiced today did not exist. Traditionally, canoes were used for specific purposes such as fishing, voyaging, war, general transportation, and even for burials. He added that, when compared to modern-day *koa* racing canoes and excluding the voyaging canoes and those used in war, the majority of the traditional canoes were shorter in length and wider to accommodate things like fishing gear and fish. Doug continued, when canoe racing grew in popularity during the 20th century, the first canoes that were used were fishing canoes that ranged in length from 30-35 feet. As the sport evolved to become more competitive, so did the style of the canoes. The shorter fishing canoes were adapted—the overall length increased by an additional 10 feet and the width and height tapered down to create less drag in the water. He explained that the modern *koa* racing canoes now range anywhere between 30-45 feet. In addition to these adaptations, Doug elaborated that how the canoe is to be used will determine the general shape of the canoe. For example, shorter canoes allow for better turning capabilities thus they are better suited for regular regatta races and longer canoes are more appropriate for long-distance channel racing.

Aside from *koa* racing canoes, Doug shared that he has made a four-man Albizia surfing canoe for a guy on Maui, a 20-foot *koa* canoe for a homeowner in Kūki'o, and a canoe made of mango wood for Kamehameha Schools. Another type of canoe-making technique Doug spoke about is the plank method, in which small planks of *koa* or other types of wood are fixed together to form a canoe. Doug however revealed that technique is not his preferred method, however, he will build whatever type of canoe someone asks for, given that there is a purpose for its use. When asked if he has had to build a canoe for a burial, Doug related that this is the only type of canoe has not built because canoe burials are not common today.

When asked about the size and status of Hawai'i's canoe carving community, Doug shared that this community is very small. He explained that there are two primary groups of canoe carvers in Hawai'i, a handful of carvers who specialize in refurbishing and modifying existing canoes and even fewer who have the knowledge and capacity to transform a log into a usable canoe. He noted that it takes a lot of work, dedication, and financial investment to be a carver, especially for those in the latter category. Doug related that for those who are inexperienced, it can be challenging to simply start the shaping process. He identified the following individuals as the community of canoe builders who can transform a log into a useable canoe: Sonny Bradly from O'ahu, Uncle Manny Veincent from Waimea (now retired from building) and his family, and Doug's family, the Bumatays. Doug also identified Bill Rosehill, a Kona native who is also a part of the project's working group, as a carver who is sought out for refurbishing. Doug shared that since the racing association requires that clubs race with *koa* canoes to keep with tradition, these handful of practitioners are the ones who are usually sought out to build *koa* racing canoes.

When asked about the process canoe clubs go through to have a *koa* racing canoe made, Doug shared the first step is for the club to acquire the log. He added, he does not undertake this part of the process for the requesting clubs because it is a long process. Once the log is acquired by the club, he will then inspect it carefully looking for any rot or peculiarities that will influence the shape and size of the canoe. Doug related that in the past, pre-1980s, most of the canoe clubs went out in search of a log, built their own canoe, collected *hau* for their 'ama and 'iako and even made their own repairs. However, he lamented that over the years most clubs no longer do this, rather they will "call and order" a canoe. Doug shared how this shift away from building and repairing your own canoe has, in part, impacted the appreciation one has for the canoe and carving as a practice.

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In perpetuating this practice beyond his family, Doug spoke about his family's participation in the International Festivals of Canoes held annually during a two-week period on Maui. He explained that at this festival, canoe builders from Tahiti, Tonga, Aotearoa, and other Pacific Islands come together to showcase their styles and techniques of canoe building. Doug noted that his family first attended this festival sometime around 2000 when his father was approached to participate in the festival, noting that there wasn't a good representation of Hawai'i's canoe builders at that time. Prior to participating, his father attended the previous festival to get an idea of what to expect, and upon his return, they planned out how they would accomplish building a canoe from log to the launching ceremony. Taking into consideration a working crew of four, they prepared plans, templates, goals, and refined their technique for the event. This aided immensely as they were able to finish the canoe within the first week, noting that in reality the work would be stretched out for months, sometimes even years. While working on their canoe, he shared how the other groups would observe them and at times took their discarded pieces to be utilized in their canoes. Doug shared that the biggest takeaway from this festival was their ability to share their knowledge with all the Pacific Island groups.

In 2012, Doug along with his father, brother, and friend showcased their skills and art in an event held in Japan. In Japan, he compared their ceremonial practices to that of the traditional practice of Hawaiian canoe building. He recalled an elaborate ceremony for cutting the tree. He shared how this trip was one of the most challenging events because there was a language barrier and obtaining the tools needed to finish the job was difficult. Luckily, he shared there was a boat-building company in the town where the event was held, and they loaned their tools to Doug and his family. In the end, Doug folks finished a 35-foot mahogany canoe within 11 days and they eventually returned to Japan a few years later to complete another canoe project.

When asked about the "life span" of a canoe, Doug asserted that with proper maintenance and storage, a *koa* canoe can last hundreds of years. He shared how currently there is a canoe being repaired at his father's house that belongs to a family in Waimea. This canoe, he explained, was previously on Kaua'i for several years and then utilized by the Kaua'i Canoe Club for an additional twelve years. He approximated the age of this canoe to be about 100 years old. He does not doubt that there are racing canoes that are close to this age, bringing attention to the 60s, 70s, and 80s when the majority of *koa* racing canoes were built. Additionally, he spoke his club's *koa* canoe, Laka, and how this canoe has allowed many generations of kids and families to continue paddling because it is properly maintained and stored.

When asked about his thoughts on the proposed project and the dedication of Kapāpala as a harvesting spot for practitioners, Doug expressed how important this project is for traditional canoe building. Taking into account the current process, Doug revealed that there aren't many places that are easily accessible to carvers. He added that while there are landowners who are willing to allow harvest and the State offering reserves as potential spots, he explained that these areas often lack roads to get into the forest as well as restrictions on the use of heavy machinery that would otherwise aid in the felling and hauling of the log. Doug elaborated on how the use of heavy machinery is a lot more effective in clearing enough space around the tree and getting the logs out. He emphasized that the scarification caused by the machines is very beneficial to the forest because it activates the dormant *koa* seeds that would otherwise not germinate.

Concerning the impact the proposed project will have on the practice of *koa* canoe-making, Doug reflected that although canoes today can be made from various types of wood, *koa* is still the choice wood and is required by the canoe racing association so that we can continue to keep within Hawaiian canoe-making traditions. If provided with this resource, Doug elaborated, *koa* canoe carvers can continue to perpetuate this long-standing practice and train another generation to do the same. Because *koa* suitable for a canoe is scarce, those carvers in training typically have to practice on other types of wood, however, he felt it is vital to train upcoming carvers on *koa*. Doug opined that *koa* is only found in Hawai'i and that alone makes it particularly special. The other reason is that the physical characteristics of the *koa* are unmatched, especially for canoes. He added that it is one of the few native trees that can grow big enough to a workable size to make a canoe. In closing, Doug shared that the canoe is perhaps, one of the most important aspects of Hawaiian culture. Canoes are how Hawaiians got to these islands, it is how they got their sustenance; it was their primary mode of transportation and the vessel in which some were buried.

LANI CRAN PETRIE AND DALE & JODY FERGESTROM

On October 25, 2022, a site visit/ group interview was conducted with Lani Cran Petrie, owner of Kapāpala Ranch, and Dale Fergestrom, Instructor of Nā Pe'a, a youth program that instills social and environmental responsibility through the perpetuation of traditional Hawaiian sailing—a program of the Nakoa Foundation. Dale is also a Nakoa Foundation board member and has spent the past fifty years paddling, sailing, and repairing canoe. Also present at this interview was Dale's wife, Jody Fergestrom, Lani's eldest son Alex Petrie, and ASM staff, Manuel Lopez. The interview commenced at the Kapāpala Ranch headquarters followed by a drive and stops at different places in the project area where discussions resumed.

The group convened at the Kapāpala Ranch headquarters for introductions and discussions about the scope of the current study. Lani shared a few historical maps including the 1907 map of Kapāpala (see Figure 25) and a 1930 map of Kapāpala Ranch (see Figure 31). Lani pointed out the location of the project area on these maps and noted that the project area was once part of the ranch's Yamaoka Paddock. She believes the paddock was named after the contractor that constructed the fence around the parcel. She explained that it was a common practice on the ranch to name different paddocks and even gates after those who built them. A brief discussion was also had about the historic battles between Keōua and Kamehameha that occurred in 'Ōhaikea and 'Ainapo and the trails that were used in these battles. In discussing the location of these battles, Lani shared that she believes these battles took place in the area north of the project area and referenced historical descriptions that indicate how the ocean was viewable from the battlefield. She elaborated that there are a few areas on the ranch where the ocean is clearly viewable but noted that the project area is not one of those locations. The group then loaded up on two side-by-side utility terrain vehicles and headed to the project area.

While driving to the project area, Lani shared that today, the ranch is comprised of some 34,000 acres with more than half (~20,000) of that acreage used as free-range. She noted that historically because much of the ranch is on *pāhoehoe* lava with very thin soils, only those areas within the ranch with deeper soils were used for growing sugar cane. It is within these former cane-growing areas that the ranch carries out intensive grazing for livestock production. The ranch maintains about 2,000 head of cattle along with goats which they rotate in different areas to manage vegetation. She explained that ranching did occur in the project area but since the establishment of the project area as a *koa* management area some thirty or so years ago, the ranch ceased operations in that section. Lani noted that just prior to the project area being set aside, sometime in the late 1980s and early 1990s, a man named Steve Baczkiewicz operated a sawmill in the project area. She recalled that her father, John "Gordon" Cran was instrumental in setting aside the project area for forest management. Lani stated that when the ~1,200-acre area was first set aside, it was for *koa* management and harvesting of dead and or downed trees but this later changed to the present scope which is for the sustainable harvest of *koa* for *koa* canoes.

In talking more about the unique landscape of Kapāpala Ranch, Lani described it as a working landscape—a place where people live and work responsibly to strike a social, economical, and ecological balance. She explained that the ranch is adjacent to the Ka'ū and Kapāpala Forest Reserve and within the Kapāpala Cooperative Game Management Area all of which are "State-managed areas". Because of this arrangement, areas of the ranch areas are accessible to the public for certain recreational activities such as seasonal game bird hunting, hiking, and access to the forest reserves for subsistence, recreational, or commercial gathering.

The site visit continued into the lower elevation of the project area. Here, Lani pointed out a 1.5-acre *koa* test plot that was planted by Horticulturalist, Aileen Yeh of the Hawai'i Agriculture Research Center. The purpose of this test plot, as Lani remembered was to study thrips and other *koa* diseases. Lani recalled that 30 years ago, she could ride her horse through the project area with ease which made accessing and managing the forest much easier. However, since the State acquired the project area, this forest has become more overgrown and difficult to access. She added that although *koa* is found throughout the project area, the size of the trees varies greatly because of the local substrate which influences the tree's ability to access deeper pockets of soil, nutrients, and water. Lani and Dale shared that some of the choice trees for *koa* canoes are found along the roadways in previously disturbed areas and that the old-growth *koa* forest where some of the largest trees are found is in the mid to upper elevations *mauka* of the north-south oriented road that cuts across the project area. Concerning the fencing, Lani believes the first fence was put in around 1906 during which time no equipment was used but later her father dozed the fenceline.

When asked about any past or ongoing cultural practices, Dale and Lani shared that there are people who access the forest to harvest *maile* (*Alyxia oliviformis*), mostly for commercial purposes and that such activities require a permit from the DLNR. She believes that the *maile* pickers is one user group that has not been engaged in the proposed project and recommended that the State and or ASM staff attempt to reach out to them.

Both Dale and Lani expressed that to manage the project area as a *koa* canoe management area, the State if they are genuine about this goal, needs to implement activities that encourage the regeneration (i.e. replanting, scarification) and growth (i.e. thinning, pruning) of *koa* in a way that makes them suitable as canoe logs. They contended that the current method of passively managing the forest will not yield the desired results and that the State must take action to intensively manage this *koa* tract if they hope to extract any *koa* suitable for canoes. Dale elaborated that the shape of the canoe is found in the tree and that the tree determines the overall shape and features of a canoe. Lani opined that if you don't take care of the *koa* forest, like any living species, it will eventually die and that to perpetuate this forest as a *koa* canoe forest—which is a long-term initiative—you must interact with it regularly. Additionally, Lani and Dale felt that undesirable plant species need to be kept at bay and that the State must consider the economics of managing this forest because relying solely on State funds, which is the status quo, is unsustainable. Lani expressed that there are all sorts of

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“values” that people attach to forest resources, including but not limited to cultural and economic, and that the Ka‘ū Forest Reserve because of its sheer size and resources, has a very high cultural and economic value. She stressed that as a rancher, whatever resources are within and even beyond the ranch boundaries (pastures, fencing, gates, water, plants, animals, etc.) are assets and she must do all she can to maintain and protect these resources to ensure the long-term sustainability of the ranch. She reflected that without proper management of these resources, the ranch would be nonexistent thus she urges the State to make the financial investments needed to properly care for this *koa* forest.

In speaking more with Dale, he reflected that without the canoe, there would be no Hawaiians and that the canoe is a defining feature of Polynesian cultures. He shared that the Hawaiian canoe, although it lacks ornamentation, its fundamental design has been masterfully adapted to Hawaiian waters. He added that traditionally, the canoe was used for fishing and travel and that over the decades, it has been adapted for racing. Some of these adaptations, Dale noted, include the overall increase in the length of the canoe, the decrease in weight, and the narrowing of its hull. However, he affirmed that the core design for racing canoes remains unchanged from tradition. Dale recalled that carvers have in the past tried to innovate beyond the traditional design, however, they always return to tradition because its design has already proven to be the most superior on the ocean. The Hawaiian canoe, Dale shared never overpowers the ocean because it was designed by Kanaka in a way that allows it to move fluidly on the ocean. In reflecting on the current project and the challenges Hawaiians have and continue to face in their ability to perpetuate their cultural practices in today’s political climate, Dale stated that the Hawaiian canoe is the perfect metaphor for the Hawaiian concept of *pono* (balance, excellence, equity) and what should be achieved as part of this project. He articulated that for a canoe to float and move efficiently on the ocean, it has to contain three main parts, the *wa‘a*, *iako* (outrigger boom), and *ama* (outrigger float), all of which at any given time is in a state of constant tension. He elaborated that all three components are not equal and are useless unless each component is lashed together which distributes the tension across all three parts; only then will the canoe be able to move efficiently and do the work it was designed to do.

Lani and Dale recalled that this project has been ongoing for at least thirty years and within that time, the State has made very little progress, which has caused a lot of frustration, especially amongst those in the working group. Lani, who has been a part of the working group assisting with the development of the management plan for this forest, expressed concern over certain elements of the draft management plan and provided the following recommendations. She felt that harvesting of *koa* should be scheduled, preferably during the summer when the weather is drier, and any logs approved for extraction should be harvested at once, rather than each approved club/group harvesting on their own schedule at different times of the year. She noted that the road that runs along the perimeter of the property is in poor condition and that it gets washed out during heavy rains. Thus, she cautioned that if the State has to fix the road every time a club/group is ready to harvest a log, it will be costly. Jody recommended that the State have a list of approved vendors who have the proper equipment and knowledge of how to properly decontaminate, harvest, and extract *koa* from the forest. Jody and Lani felt that in this way, all the harvesting activities are consolidated to once a year and that the forest is allowed to rest and regenerate for the rest of the year. Also, Jody believes there are probably not enough logs to sustain an annual harvest and those harvest intervals could well be at less frequent intervals. Based on their experience, Lani and Dale believe that the disturbance caused by the harvesting and extraction process will most likely result in the emergence of more *koa* seedlings and increase diversity in the *koa* gene pool. Dale shared that because there are so few carvers with the knowledge and expertise to transform a log into a usable canoe, he felt that the number of logs that would be extracted from this forest annually would be very low. He added that because it can take anywhere from 1-2 years or sometimes longer to make a single canoe he was certain that harvesting can be done sustainably. In thinking back to the draft management plan, Dale expressed his support for each club/group demonstrating their capacity and having a plan to construct a canoe from the *koa* extracted from this forest. Dale asserted that with today’s carving methods, there is very little waste as all wood can be used; smaller planks can be transformed into seats or *manu* (bow and stern endpieces) or other smaller components. Dale and Lani expressed grave concern and were not supportive of the proposed no-take/restriction areas in the draft management plan. Dale reasoned that some of the best *koa* canoe trees are found in these areas and that prohibiting the take of *koa* within any part of the project area runs counter to the purpose and intent of the KKCMA. He added that clubs/groups already face many difficulties in obtaining a *koa* log thus implementing no-take/restriction areas, within a management area whose primary purpose is for the sustainable harvest of *koa* for *koa* canoes, only adds to the difficulties of perpetuating canoe carving as a traditional cultural practice.

JOHN REPOGLE

A telephone interview was conducted with Mr. John Repogle by ASM staff, Lokelani Brandt on December 6, 2022. Mr. Repogle was born in Laupāhoehoe and moved to Na‘āahu when he was three years old. He currently resides in Ocean View and is retired from The Nature Conservancy, and currently works as a substitute teacher at Na‘alehu Elementary

School and Pāhala Intermediate and High School. Since 2015, Mr. Repogle has been an active member of the KKCMA Working Group.

Mr. Repogle recalled that shortly after their initial 2015 kickoff meeting, he and other members of the working group made a site visit to the KKCMA. He shared that he had been to the KKCMA in prior years when Aileen Yeh of the Hawaii Agriculture Research Center was investigating the *koa* wilt disease in which they outplanted *koa* in test plots to better understand why some *koa* were being affected and others were demonstrating resistance against this disease.

As far as cultural practices, Mr. Repogle shared that hunting and *maile* gathering are two practices he recalled occurring in the project area and general vicinity. He recalled a story from his childhood in which some kids from Pāhala went hunting on the ranch and got caught by the ranch manager. He added that because of the road around the perimeter of the KKCMA, *maile* pickers very much prefer to gather from this tract. Mr. Repogle recalled garbage bags full of *maile* being extracted from this tract, which for the most part, is sold commercially. He worries that the extensive harvesting of *maile* may be unsustainable.

He reflected that there has always been tension between the hunters and the ranch. More specifically, he shared that in the KKCMA, hunters will sometimes leave the gate open and cattle will go in and graze. He highlighted that the cattle will also eat and destroy plants and sometimes injure the *koa* trees. Mr. Repogle expressed that cattle won't stay in there for long because there is no water source, however, they can sometimes be in the KKCMA for a few days and sometimes weeks. He noted that the issue with cattle entering the KKCMA creates a unique and sometimes difficult dynamic in which there is much finger-pointing between the hunters, the ranch, and the State who often takes a very passive management approach. Mr. Repogle stated that hunters have for many years consistently asserted themselves when it comes to the use of State lands and that the State has consistently given in to their demands. He explained that the use of the forest is a privilege and that the State must hold hunters and the ranch accountable. He added, "everyone must do their part to protect our forest."

Mr. Repogle expressed that the entire perimeter of the project area is fenced, however, it is not hog-proof. He opined that if the State is serious about utilizing this parcel for *koa* canoes, they must install hog-proof fence to prevent the pigs from rooting and digging and damaging the forest and *koa* trees. Mr. Repogle reminded that growing *koa* suitable for canoes doesn't happen overnight, thus proper protective measures such as hog and cattle fencing must be installed and maintained as part of long-term management.

In speaking about the KKCMA's importance and potential, Mr. Repogle lamented that is it a small piece of Ka'ū's vast forest with special status. He acknowledged that although he doesn't have much experience with paddling or the paddling community, he felt that paddlers today don't have a strong connection to the forests. People most often associate paddling with the ocean because that's where it actively takes place, however, Mr. Repogle reminded that without the forest, the *koa* canoes in which paddlers are mandated to use during certain regattas would not exist. He felt it would be valuable to expose the members of *hālau* (canoe clubs) to the forest and help them build a deeper connection to their sport. He strongly believes that the KKCMA can serve as an ancient canoe gathering site where paddlers and our communities can come to learn about the forest.

In talking about his vision for the KKCMA, Mr. Repogle felt that it would be of tremendous value to have a dedicated person who is knowledgeable about the forest ecosystems and *mo 'olelo* of this area. He felt that such a person would be able to help coordinate with the various groups. He imagined that *hālau* or other community groups would be able to spend the night at the KKCMA where they could be exposed to environmental education, learn the *mo 'olelo* of the area, do outplanting, weeding, and immerse themselves in the forest. He contended that all *hālau* receiving a log from the KKCMA should be required to have some sort of environmental and cultural educational experience. He supposes that perhaps not all *hālau* members would want to do something like this but they should at least be invited and given the opportunity to participate. Additionally, Mr. Repogle asserted that there needs to be some reciprocation or giveback from those *hālau* who receive a log from the KKCMA. He reflected that traditionally, removing a large tree from the forest was a big deal and noted that Hawaiians had rigid protocols for taking *koa* from the forest which sometimes involved human sacrifice in exchange for the tree as a way to replace the *mana*.

Mr. Repogle asserted that it is important for those *hālau* who receive a log from the KKCMA to do more than simply take a tree. Rather, those *hālau* should see themselves as stewards of this area. He felt that *hālau* should be able to experience all parts of the process, from planting, growing, maintaining, log selection, and harvesting. He thought that *hālau* may even help with dragging the log from the forest but noted that the State always has to consider liability. Considering the reuse of any waste when the tree is prepared to become a canoe log, Mr. Repogle contended that it would be valuable to have the carvers there who know how to repurpose any excess wood. In this way, he believes there would be very minimal or no waste of the tree. He felt having an immersive approach would help build capacity for protecting and stewarding our forest resources and build greater appreciation among *hālau* members for the *koa* canoes

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they paddle in. Mr. Repogle thought that clubs could be recognized by the lead canoe club organization for their time and efforts in the KKCMA forest, which might encourage other *hālau* to take part. He felt that if *hālau* and the greater community can participate regularly in cultural-environmental educational opportunities, this could make the project far more sustainable. He imagined that if a project of this nature, which incorporated such elements, could be established here in Ka‘ū, then other islands might want to follow suit and establish a similar program on their island or in other parts of Hawai‘i Island. He felt that in this way, the community can actively participate in taking care of these *koa* canoe plots rather than leaving that responsibility solely to the State.

Concerning log allocation, Mr. Repogle shared that if a *hālau* is a recipient of a log from the KKCMA, they should drop to the bottom of the list. He underscored the importance of looking at the log allocation process based on equity. Furthermore, he questioned, “what constitutes a *hālau* being ready to receive a log.” He opined that the Working Group has deliberated extensively about the log allocation process.

In closing, Mr. Repogle stated that there is great potential with this project as it relates to the enhancement and revitalization of Hawaiian canoe making. He shared that when he was first approached with this project back in 2015, there was a lot of excitement and that the Working Group felt very positive about it. However, he noted that as the project unfolded frustration began to build especially with how long this process has taken and how poorly thought out the whole process has been. Despite his frustrations and challenges, Mr. Repogle believes this project, if the State is serious about it, could be very beneficial to Hawaiian canoe practices.

KALĀHO‘OHIE MOSSMAN, EDITH KANAKA‘OLE FOUNDATION

An in-person interview was conducted with Mr. Kalāho‘ohie Mossman on December 13, 2022, in Pana‘ewa, Waiākea, Hilo. Mr. Mossman serves as the *Ilāmuku* (Executive Officer) for the Edith Kanaka‘ole Foundation, a non-profit organization established in 1990 to perpetuate the teachings, practices, and beliefs of the late Luka and Edith Kanaka‘ole.

Born in Kailua, O‘ahu, Mr. Mossman shared that he moved to Hilo in the 1980s to attend college and during that time, he met his wife, Huihui Kanahele, who is the granddaughter of Luka and Edith Kanaka‘ole. When asked about his *pilina* (connection) to Ka‘ū, Mr. Mossman shared that although his ‘ohana had ties to Ka‘ū, much of his *pilina* comes from his wife’s family, whose ‘ohana is also from Ka‘ū. He added that Mr. Luka Kanaka‘ole (Grandpa Luka) worked at Kapāpala Ranch for many years where he was born but the ‘ohana came from the *ahupua‘a* of Keāwa where there is a family cemetery. In sharing more about what he remembered of his grandfather-in-law, Mr. Mossman recalled that Grandpa Luka had at least two other brothers, Tommy and David. Although he did not know much about Tommy’s life, he added that David also worked and lived on the ranch until he died. Also, Grandpa Luka had a sister, Aunty Api who worked as a cook and nanny on the ranch. Mr. Mossman related fond memories of Aunty Api, especially her talent as a cook. He explained that Aunty Api was known, amongst other things, for her beef stew and desserts. Mr. Mossman described how during his early years with his wife, they had visited the ranch and spent the night there. But because it was “old school style” in which boys and girls had to sleep separate from each other, he laughingly shared that he had to sleep with his wife’s boy cousin on a small bed.

When asked if they ever went to Kapāpala to gather or do any other types of cultural practices, Mr. Mossman described hunting with his wife’s cousin. He noted that they did not gather any trees from there but did hunt occasionally. In sharing more about Grandpa Luka, Mr. Mossman commented that he “taught me a lot” specifically wood carving most of which was done for *hula* implements. He added that Grandpa Luka worked at the prison where he started a woodworking program with the inmates. In sharing a bit more about Grandpa Luka’s ‘ohana, Mr. Mossman related that Grandpa Luka’s grandparents were killed in the 1868 mudslide, however, Grandpa Luka’s great-great-grandfather, Mokila was a canoe builder. He explained that he had come across an unpublished manuscript written by Mary Kawena Pukui about the Ka‘ū families in which it described Mokila as living at Waikapuna and was a “*mālama i‘a*” or the person who sets the rules regarding fish and fishing.

In speaking more about gathering forest resources, Mr. Mossman laughingly explained that although they hunted in Kapāpala, during those trips he didn’t pay much attention to the forest because they were more focused on the dogs and pigs. However, he went on to share that for *hula* they do gather various forest resources mostly from the Waiōhinu side of the Ka‘ū Forest Reserve. For their *hula* customs, gathering focuses specifically on *kinolau* of certain *akua* (deities) including, ‘olapa, ‘ie‘ie, maile, and lehua. Mr. Mossman added that *palapalai* is another *kinolau* however, they go elsewhere to gather this fern. In addition to gathering certain plant resources for *hula*, Mr. Mossman related that they also gather other plants including *māmaki* and the young shoots of the *hāpu‘u*, which is more for subsistence purposes. He clarified that what they gather does not destroy the tree and that is it very rare for him to kill a tree to build something, rather he prefers to use fallen trees.

In sharing more about wood carving, Mr. Mossman explained that he had trained under three carvers, mainly Alapa'i Hanapī of Moloka'i, Keola Sequeira of Maui who built the sailing canoe Mo'olele and many *ki'i* (wood images), and Ray Bumatay of Hilo who focused mainly on canoes. He added that Mr. Bumatay's sons, Doug and Aliko continue to carry out their late father's carving legacy. Talking more about his time with Mr. Bumatay, he shared that, he, Mr. Bumatay along with students from Ke Ana La'ahana Public Charter School carved a canoe at Hale O Lono fishpond in Keaukahā. Mr. Mossman described how they were in search of a log and coincidence or not, a large Norfolk pine growing near the fishpond had fallen right where they were planning to carve the canoe. Thus, they utilized pine for that canoe. Mr. Mossman related that Albizia is a good wood to practice on and elaborated that *koa* may not be the necessary wood for teaching. However, he added there are "strong opinions on the use of *koa*". He stated that there are very few carvers that carve in the "traditional manner" meaning that they used mostly traditional tools and techniques. From his understanding, the sailing canoe Mauloa, which is a smaller sailing vessel was built using traditional techniques and Maulili Dickson would be the one to talk to about Mauloa. In reflecting on the traditional and modern methods of canoe carving, Mr. Mossman felt that with modern tools and techniques, there is far less waste when compared to traditional carving. He explained that traditional carving usually involves chipping out chunks, which are usually discarded, to hollow the canoe. Thus, from a large tree, when the carving is complete, only a fraction of the original tree remains. He added that with modern technology, smaller planks can be laminated thus there is far less waste.

Mr. Mossman explained that if you're going to "push the traditional aspect of using *koa*" one needs to understand that there are a lot of protocols involved. He clarified that traditionally the "*ho'okupu* (offering) is life for life" meaning that a human was sacrificed when a large *koa* was removed from the forest. He felt that today such practices are not going to happen, however, he felt there needs to be proper *ho'okupu* when a tree is removed. In describing other *ho'okupu* that could be used in place of a man, Mr. Mossman shared that a *pua'a* or an *'ulua* were sometimes used as a substitute. He noted, "there is a price to pay when you kill a tree."

In sharing some of his concerns and recommendations, Mr. Mossman expressed that if the State's intentions are true, then the trees within the KKCMA project area need to be "managed very well." He added that trees most suitable for canoes need to be big and straight with minimal rot. He also related the importance of the 'elepaio bird in helping carvers to determine the level of rot in a tree. One of his concerns is ensuring the trees are properly tracked after they are harvested. He elaborated that "*koa* is big money" and that this is largely driven by "*koa* entrepreneurs." He explained that while many of such people may gather from ranches, their supply is finite and as access to *koa* becomes more difficult, the price goes up. He cautioned that with a project like this which gives exclusive rights to canoe carvers and that specific community, the State is setting a precedent. He cautioned, what happens when traditional weapon makers, bowl turners or others come forward seeking *koa* from the State? While he believes this project is beneficial for canoe carving, he worries that other woodworkers will come forward and question the precedent of this project. Thus, for him, a project of this nature provokes conflicting feelings and is a "double-edged sword." In closing, Mr. Mossman reflected that he is "super grateful for the learning process [carving], but I love the forest" and although he advocates for the perpetuation of traditional cultural practices, he expressed the difficulties in balancing that with conservation efforts.

KATIE KAMELAMELA, PH.D.

On February 2, 2023, ASM staff, Lokelani Brandt conducted a Zoom interview with Dr. Katie Kamelamela. Born on O'ahu, Dr. Kamelamela moved to Hawai'i Island in 2015 while pursuing her Botany Ph.D degree from the University of Hawai'i at Mānoa. Dr. Kamelamela's research has focused largely on understanding historical and contemporary Hawaiian non-timber forest plant gathering practices. She continues this work by advocating for pathways that align the needs of conservation and culturally vibrant communities—a concept she has defined through her research as "...the relative state of Hawaiian cultural health and well-being as indicated by the frequency, intensity, richness, authenticity and pervasiveness of Hawaiian language, cultural practices and the application of Hawaiian world view." She explained that while pursuing her doctorate, she began working with the State of Hawai'i-Division of Forestry where she reviewed their gathering permits. At the time she was conducting her research, the Kapāpala Working Group (KWG) was formed, and she was asked to participate in the KWG meetings as an observer. Thus, Dr. Kamelamela has been active in the proposed project for about eight years.

Although her participation in the KWG is more recent, Dr. Kamelamela shared that her maternal grandfather, Mr. Julian Ahu (Morgan) was born in Pāhala but raised on Kapāpala Ranch during the early 1900s. She added that her grandfather was a part of one of the first graduating classes from Kamehameha Schools (ca. 1891) and after graduating, he became a work hand for Kapāpala Ranch. She recalled her aunty folks visiting the ranch some years ago to see where Grandpa Ahu lived as well as a cemetery located near the ranch house.

When asked about any past or ongoing cultural practices specific to the KKCMA, Dr. Kamelamela related that *maile* gathering is ongoing within the KKCMA. She elaborated that some of the *maile* gatherers are 2nd and 3rd generation

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practitioners and have been doing so with the support of Kapāpala Ranch. Dr. Kamelamela spoke extensively about gathering practices and described there being different degrees of “practice” which she explained thusly: the “I like see and try” folks—those who are seeking to learn how to gather but lack the knowledge and personal guidance of how to sustainably harvest; the “occasional gathers”—those who periodically make the trek into the forest to gather and may have some knowledge of how to sustainably harvest, and; the “I make a living gathers a.k.a. commercial gathers”—those who enter the forest regularly and have in-depth knowledge of how to sustainably harvest and are tuned into the subtle changes of the forest. Dr. Kamelamela further explained that even amongst plant or even *hula* practitioners, there are “generalists”—those who have general knowledge about plants—and “specialists”—those who have in-depth knowledge about plants, their life cycles, habitat, relationship to other plants, etc.

Dr. Kamelamela lamented that it’s the rookie—the “I like see and try” group—that causes the most damage to the forest because they lack the knowledge and personal guidance of how to harvest sustainably and appropriately. She added, even with the State-issued gathering permit, anyone can obtain that permit, therefore, it is not an indicator of ones’ gathering knowledge more so that people are gathering. Dr. Kamelamela emphasized that it is through frequency and exposure—*ma ka hana ka ‘ike* (learn by doing)—that people develop into specialists. Thus, she articulated that it is precisely the commercial gathers who have the most intimate knowledge and understanding of the inner workings of the forest. Dr. Kamelamela shared that the commercial gatherers have a “different rate of return” meaning that their livelihood and basic needs are generated directly by their ability to gather *maile*. In contrast, she added, the rookie or occasional gatherer does not face this same economic fate, however, they may develop their spiritual sense of self-worth. Commercial gathers, she explained, must also build their customer service skills and be reliable so they can continue to serve their customer base. In essence, because of their frequency into the forest, Dr. Kamelamela added, the commercial gathers’ ability to read the nuances of the forest is incomparable to the rookie or novice gatherers. Lastly, she noted that although commercial gatherers may sell a large portion of their *maile*, many of them are also known to donate their pickings to others in the community whether that be for family functions or events.

Another example here can be experiences between recreational and subsistence pig hunters. When your livelihood and/or identity of self is defined by successful production, harvest, and processing of natural resources for community, levels of observation deepen because you are dependent on the resources, physically, culturally, and economically. Many people show their *aloha* through providing food, *lei*, and stories of and from the forest in lieu of monetary exchange. These exchanges build and strengthen social networks and the cultural fabric of our island. In order to become someone with a deepened relationship, you have to go through the rookie phase. There are more people learning than who are masters, as in any profession, art, or market. Dr. Kamelamela, through her research experiences, has been the rookie in many arenas of forest gathering and although far from a master, is able to provide support through learned forest mistakes, lessons, skills at community gatherings such as *lei* making and building *imu*.

When asked about her thoughts on the proposed project, Dr. Kamelamela felt that it is a novel idea and that the current project initiatives are intended to develop a process for gathering *koa* from the KKCMA. She explained that the State has a list of log requests which is sorted by forest reserve but she does not know how many groups/individuals are currently on the Kapāpala list. She felt that some of the biggest challenges right now with this project is 1) the steepness of the terrain within the KKCMA; 2) the protocol for harvesting the logs; 3) ensuring non-racing canoe (i.e. fishing and voyaging) groups/individuals have equitable access to logs from the KKCMA. Dr. Kamelamela reflected that the project is a good idea in theory and intention, however, she felt *minamina* (expressing regret, grief, sorrow) in that the process has become unnecessarily complicated. In thinking about recommended actions for challenges 1 and 2, Dr. Kamelamela felt that it would wise for DOFAW to develop clear protocols for harvesting the logs that would include having a list of approved harvesters rather than leaving that decision to the clubs. Concerning challenge 3, she shared that there is a cost for making a canoe, so in all honesty, it is really simple in that clubs either have the funds or don’t.

In talking through some of the other challenges that have arisen during this process, Dr. Kamelamela spoke about the tensions that develop when contemporary conservation practices intersect with traditional Hawaiian beliefs and practices. For example, she pointed to the prior discussions about harvesting the logs and the potential impacts on native bird populations and plants. She explained that when it comes to “impacting the forest” the conservationists’ approach is albeit, reluctant and fearful, thus the solution is often to restrict or prohibit access. However, from a traditional Hawaiian standpoint, we want to “impact” the forest and it is precisely these beliefs and practices that challenge contemporary conservation practices. She emphasized, yes when a tree is felled, it will impact other plants, however, these impacts are inconsequential. Dr. Kamelamela added, when a tree, however, small or large is felled and dragged out of the forest, that process scarifies the land and catalyzes the regeneration of new forest growth that would otherwise not occur. She stressed, for the KKCMA harvesting process, the priority concern should be human safety. She elaborated that these sometimes competing narratives, can create *hakakā* (strife, dispute, arguments) between Native Hawaiians

and conservationists, however, this is and should not be the goal. To combat this tension, she felt that both sides must get ahead of the narrative and reenvision a path forward.

Dr. Kamelamela opined that her mission has been to “uplift the relationships that Native Hawaiians have to plants.” If the proposed project is to be “successful,” there needs to be a shift in understanding. She emphasized that measuring the success of this project should not be based solely on the number of canoes built from the logs harvested from the KKCMA, rather success should also be measured by other indicators such as are people’s relationship and engagement with the forest improving; and, if we happen to fail at any metric, “we learn, do better” and keep on with the work.

In looking to the future, Dr. Kamelamela felt it important that DOFAW provide adequate support so that people can access the forest as this will reduce potential impacts on the community and resources. She highlighted the importance of having a dedicated person or staff for the KKCMA. She added that if DOFAW is serious about this project, they need to lobby at the legislature to get a new position. She noted that currently there is no formal administrative infrastructure to support any of the activities proposed for the KKCMA and remarked that it’s all too common for agencies to want to “do Hawaiian things but don’t want to fund it.” She felt that the lack of dedicated staff will only lead to confusion among DOFAW and the community. Lastly, Dr. Kamelamela noted that because the log request application process is brand new, it must be beta tested to uncover any issues or discrepancies before being launched.

4. IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include “...subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs” (OEQC 1997:1). The guidelines also identify the types of cultural resources, associated with cultural practices and beliefs that are subject to assessment. These include other types of historic properties, both man made and natural, submerged cultural resources, and traditional cultural properties. The origin of the concept and the expanded definition of traditional cultural property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service (Parker and King 1998). An abbreviated definition is provided below:

“Traditional cultural property” means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community’s history and contribute to maintaining the ethnic community’s cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

“Traditional” as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. “Cultural” refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term “Property” defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of “Property” wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first place. However offensive the concept of boundaries may be, it is nonetheless the regulatory benchmark for defining and assessing traditional cultural properties.

As the OEQC guidelines do not contain criteria for assessing the significance of traditional cultural properties, this study will adopt the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

- a Be associated with events that have made an important contribution to the broad patterns of our history;
- b Be associated with the lives of persons important in our past;

- c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
- d Have yielded, or is likely to yield, information important for research on prehistory or history;
- e Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Pa'akai O Ka 'Āina v Land Use Commission* court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical or natural resources are present and/or past or ongoing traditional customary practices; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

SUMMARY OF CULTURAL-HISTORICAL BACKGROUND INFORMATION

In summary, the KKCMA is situated in the forested uplands of Kapāpala Ahupua'a, a vast land division that at one time included all of Keauhou Ahupua'a. The project area sits at the upper fringes of the *wao ama'u/wao kanaka* and extends through the *wao nahele/wao lā'au* into the *wao akua*. Although Handy and Pukui (1998) cautioned that *wao* were not fixed to any particular altitude, they did highlight the type of vegetation and activities that occurred in these liminal spaces. At the lower elevations, plants such as ferns and small trees prospered and *kalo*, particularly those varieties requiring more water, were sometimes cultivated in these areas. Other plants that were sometimes cultivated in these areas included *mai'a* (bananas), *uhi* (yams), *pia* (arrowroot), and *hāpu'u* fern, which based on Handy and Pukui's description, appears to have been allowed to grow wild, rather than intensely cultivated. Further upslope was the heavily forested *wao* where great *koa* and *ʻōhi'a* dominated the landscape—a realm sanctified by the *kini akua* (myriad gods) who dwelled therein.

The historical records indicate that forested spaces were integral to the traditional lifeways of Ka'ū's native people. Forest landscapes persist today as a highly valued cultural resource because native forests have and continue to provide the foundational resources and *mana* necessary to sustain many Hawaiian customary practices. While early Hawaiian settlers brought with them important food and medicinal plants, those resources they harvested from Hawai'i's native forest evidence their cultural adaptations to this environment or were, altogether, uniquely Hawaiian inventions. Timber provided a variety of hardwoods from which canoes, houses, *ki'i* (carved images), fishing accessories, musical instruments, weapons, and various utilitarian and recreational items were made. Aerial roots were harvested and plaited together to form tightly stitched *ie* (baskets). Ferns and vines were collected and woven into *lei* or tucked into *kapa* (bark cloth) as a scenting agent. Flowers, vines, and fruits were collected for *lei*, natural dyes, and sometimes mixed with other plants and minerals to make medicinal concoctions. The forest itself also holds profound spiritual importance as various plants found in the forest are *kinolau* (embodiments) of named deities. Because of its spiritual significance, the forest was and continues to be revered, especially by those practitioners (i.e. *hula* practitioners, *lei* makers, canoe carvers, *lā'au lapa'au* practitioners, etc.) whose customs and practices are highly dependent upon the forest.

The traditional *mo'olelo* that make explicit reference to Kapāpala, which have been handed down over the ages, carry significant symbolism and insight that must not be disregarded or diminished. These stories are a frank reminder of Pele's presence on this 'āina, her role as both *akua* and *'aumakua* to the people of Ka'ū and the neighboring districts of Puna and Kona. Native and foreign writers also reference the many lava flows that affected Kapāpala with that one from 1868, perhaps inflicting the most destruction across the district. These *mo'olelo* tell us of Pele's capacity to drive out or exterminate those who dare to defy her power and supremacy including Kamapua'a, Puna'aikoa'e, Waka, and the chief Kapāpala who defiantly surfed her molten lava but was as once swallowed into the pit of Halema'uma'u. The *mo'olelo* of Nānaele, among other things, tells us of an underground cave system spanning between Ka'ālaiki and Kapāpala that was used as a passageway by the ancient people. Lastly, the *mo'olelo* concerning the battle between Pele and Waka, a *mo'o* deity whose form is synonymous with bodies of water, informs us of the presence of freshwater resources in the uplands (i.e. waterholes and springs).

Historical records identifying specific *ali‘i* of Kapāpala are limited, however, these records do illustrate a rich lineage of district *ali‘i* including those of the famed ‘Ī-genealogy whose political power eventually extended outward from Ka‘ū into Puna, Hilo, and portions of Hāmākua. The reign of the ‘Ī line of chiefs lasted for several hundred years from at least the reign of Keawenuia‘umi when he appointed Kumalaenui a ‘Umi as a district chief down to Keōuakū‘ahu‘ula, who stood as Kamehameha I’s last rival. We know that during the reign of Lonoikamakahiki, when Kamalālāwali of Maui attempted to invade Hawai‘i Islands, Lonoikamakahiki’s brother Pupukea was residing at Kapāpala. It was Pupukea who led his vast army through ‘Ōhaikea in Kapāpala until they reached Waimea. During Keōuakū‘ahu‘ula and Kamehameha’s long-standing feud, they carried out the battle known as Kaua Kaua‘awa or “Battle of the Bitter Rain” in Kapāpala. Lastly, it was at Kapāpala that Keōua lost about 400 of his warriors to an ash fallout while returning home from a battle in Waimea.

Whereas Ka‘ū’s *ali‘i* history tells us of the powerful ‘Ī clan and their staunch resistance against the political forces of Kona and Kohala, other historical records inform us of other progenitors of the Ka‘ū families who took non-human forms. One such example is Kūa, the famed *manō* who was also an ‘aumakua and protector of the district. Other noted *manō* of Ka‘ū included Kealiikaua, Kalani, Kahole[i]akane, Kane, Haloa, Humeke, and Mikololo. In addition to the *manō*, some Ka‘ū families traced their lineage to certain plants and animals including the *ipu ‘awa ‘awa* and the *‘enuhe*.

From the historical information presented above, we know the upland *koa* forest of Kapāpala was traditionally utilized for *kālaiwa‘a* (canoe making), *kia manu* (bird catching), and *māmaki* cultivation. Use of the upland forest for canoe-making is evidenced in Lyman’s 1846 visit when he observed canoe-making sheds as well as the testimony provided by Kenoi during the 1873 Boundary Commission hearings in which he described a *piha kauhale kālaiwa‘a* near Pu‘uhoakalei. From these narratives, we learn that canoe-making sheds were established in the forest along with settlements for *māmaki* cultivation. The Boundary Commission testimony also identified bird catching in Kapāpala’s forest, specifically for the now-extinct ‘ō‘ō (*Moho nobilis*) and *mamo* (*Drepanis pacifica*). The capture of other avian resources was also noted including ‘ua‘u and *nēnē*, however, according to the Boundary Commission Testimony, these resources were allocated for the people of the neighboring Ka‘ala‘ala Ahupua‘a. The Boundary Commission hearings also described trails along Kapāpala’s boundaries as well as the ‘Ōhaikea and ‘Ainapō trails used during episodic battles. During the Historic Period following the introduction of the market economy, the forest of Kapāpala was exploited for the prized *‘iliahi* and *pulu*.

We also learn of some of Kapāpala’s *konohiki* including Tapuahi, who was there in 1823 when Ellis made his visit. Another *konohiki*, Kuihelani, was identified by Kaonohi, the *kama‘āina* who was born around 1795 and provided testimony in 1873 to settle the boundary of Kapāpala.

By the mid-19th century, during the historic *Māhele ‘Āina*, Kapāpala was claimed by the then-reigning monarch, Kauikeaouli as Crown Lands, which suggests the importance of this land to Hawai‘i’s *ali‘i*. There are no known *kuleana* claims for Kapāpala. Although the *Māhele* was meant to provide native tenants with fee-simple parcels of land, it also resulted in the commodification of the land and facilitated the process by which foreign interests could purchase land. However, because of Kapāpala’s unique Crown Land status, the king held supreme authority over all land use activities. By 1860, Frederick S. Lyman established the first small ranch in Kapāpala. Lyman’s ranch was subsequently acquired by Hilo businessmen, Charles Richardson and William H. Reed who expanded Lyman’s ranch by co-leasing the entire Kapāpala Ahupua‘a from King Kamehameha IV to form their joint venture, Kapāpala Ranch.

With a lease from the King, Kapāpala Ranch, which extended from the shoreline to the uplands to the summit of Mauna Loa, grew to be one of the largest (next to Kahuku Ranch) and longest operating ranch in Ka‘ū. Over the decades, the ranch expanded to include some 200,000 acres (and over the years has decreased in acreage) and managers experimented with a variety of crops and animals in addition to producing meat, cream, butter, wool, and *pulu* which were exported. When Reed married Jane Stobie Shipman in 1868, Reed gained three step-children, one of which, William “Willie” Herbert Shipman, would help Reed manage the day-to-day operations during the early 1870s. The ranch also gained notoriety from the many and sometimes weary visitors who stopped or stayed at the ranch house while making the trek from Kilauea to Ka‘ū. In October of 1876, Reed sold the ranch to Charles R. Bishop for \$75,000 and after just two months, Bishop sold the ranch for \$120,000 to the Hawaiian Agricultural Company (C. Brewer Co.)—a company which Bishop cofounded.

By 1877, the Hawaiian Agricultural Company, whose focus was primarily on sugar production, took ownership of the ranch. They grew sugarcane in isolated pockets on the ranch where soil conditions were most suitable (*makai* of the project area), however, livestock production remained at the heart of the ranch’s operations. Throughout the ranch’s history, drought conditions—sometimes prolonged—disrupted its operations. By the end of the 19th century, Hawai‘i’s agricultural sectors along with the government began to recognize the importance of Hawai‘i’s forest in providing water for household consumption and ranching but more importantly sugar production—which at that time was Hawai‘i’s

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largest economic industry. The combined effects of drought, forest clearing for sugar fields, water diversion, wildfire, along with indiscriminate pasturing were adversely impacting water resources across the islands.

In 1892, the government established the Bureau of Agriculture and Forestry to oversee Hawai‘i’s agricultural industries and forests. The Bureau’s primary focus was on livestock but they also implemented programs to work with private landowners to create forest reserves and control wild goats and cattle. By 1903, following the unlawful overthrow of the Hawaiian Kingdom government in 1893 and the establishment of the Territorial Government in 1900, the territorial legislature with the influence of sugar plantation owners established the Board of Agriculture and Forestry with Ralph S. Hosmer hired as the first Superintendent of Forestry. By 1906, with the urging of the Hawaiian Agricultural Company and other Ka‘ū plantations, some 75,000 acres in eastern Ka‘ū were set aside to create the Ka‘ū Forest Reserve. Three years later, by proclamation, the Ka‘ū Forest Reserve was expanded to include a tract in Kapāpala, whose northeasternmost boundary borders the project area and along which a trail identified in the 1921 and 1924 USGS (see Figures 27 and 28) maps as “forest boundary trail” extends. During this period, Kapāpala Ranch, under the management of Julian “Mauna Kea” Monsarrat, utilized the lower portion of the project area for cattle grazing.

By the 1920s, the ranch’s acreage had shrunk to about 75,000 acres and extended from sea level to about the 6,500-foot elevation. After Monsarrat’s tenure in 1923, management of the ranch was headed by Bradford “Haole” Sumner. Sumner transitioned the ranch’s water system from rainfed to pipelines when he led the construction of a water tunnel in the uplands and installed about 25 miles of pipelines to bring water down to the lower pastures. By October of 1930, by the proclamation of the Governor, 37,416 acres of land in Kapāpala extending above the 5,000 feet elevation and bounding the project area’s *mauka* boundary was established as the Kapāpala Forest Reserve. During this period, 1,151 acres comprising much of the central and lower sections of the project area were part of the ranch’s Yamaoka Paddock No. 1, whereas the upper portion of the project area was within the Ainapo Mauka Paddock.

By 1967, the unpaved road that cuts across the project area in a north-south orientation was built. In 1975, C. Brewer (the successor of the Hawaiian Agricultural Company), was looking to withdraw from the livestock business (and did not renew their lease with the State of Hawai‘i—the agency charged with managing much of Hawai‘i’s Crown Lands) and sold the ranch to Parker Ranch. Operating on a revocable permit issued by the State of Hawai‘i, the sheer size, rugged terrain, and much-needed repairs, motivated Parker Ranch to withdrawn its interest in Kapāpala Ranch. In 1977, John “Gordon” Cran secured a farm loan and added his name to the revocable permit, thus making him the owner of Kapāpala Ranch. Cran managed some 30,000 acres and oversaw much of the day-to-day operations. Around 1989, with the support of Cran, the project area was removed from the ranch’s acreage and in 2009 was established as the Kapāpala Koa Management Area of the Ka‘ū Forest Reserve. By the early 1990s, challenges with the State’s permit renewal process coupled with increasing rent made operating the ranch difficult. To alleviate some of these challenges, Cran’s daughter, Lani, and her husband Bill Petrie worked part-time on the ranch all while holding jobs outside of the ranch. Cran and his wife, Genevieve (Bertleman) continued to run the daily operations and just before Cran’s passing in 2007, he formed a partnership with his wife and daughter. After Genevieve Cran died in 2016, the ranch passed to Lani and Bill, who continue to uphold her father’s legacy as stewards and owners of Kapāpala Ranch.

IDENTIFICATION OF TRADITIONAL AND CUSTOMARY PRACTICES, VALUED CULTURAL RESOURCES

The information from the culture-historical background information in conjunction with the results of the consultation process revealed the following with respect to traditional and customary practices and valued cultural resources.

Forest Resources and Harvesting of Avian and Plant Resources

Kapāpala’s forest and all of its tangible and intangible elements have been and continue to be recognized as a valued cultural resource. The forests of Kapāpala have for many generations been accessed for a variety of avian and plant resources. The harvesting of native birds for subsistence and artisanal purposes was an important part of certain traditional practices (Gomes 2016). Perhaps, the most famed traditional use of native birds involved the use of their feathers from which spectacular royal insignia including *ahu‘ula* (feathered cape), *mahi‘ole* (feathered helmet), *lei* (garland), *kāhili* (feathered standard), and other adornments were intricately crafted. Although the capture of native birds, including *nēnē*, *‘ua‘u*, *‘ō‘ō*, and *mamo* is no longer practiced, *nēnē* was identified by one of the consulted parties as still occurring on the ranch and likely in the project area. Traditional plant gathering practices that were identified through the historical record included *koa* harvesting for canoes, *‘ilahi*, *māmaki*, and *pulu*. The majority of the consultees also identified *maile* gathering as an ongoing cultural practice that takes place in the project area.

Kālaiwa‘a and Māmaki Cultivation Settlement

The historical records indicate that settlements (*kauhale*) specifically for *kālaiwa‘a* and *māmaki* cultivation were established in the forested areas of Kapāpala. Although the location of such settlements cannot be accurately determined from the available records, we know that there was a *kauhale kālaiwa‘a* at Pu‘uhoakalei near Keauhou. While the forest environment does not lend well to the preservation of organic matter, if stone features were constructed as part of these forest settlements, identifying surface remnants of such settlements through an archaeological survey is possible. Historians who wrote about canoe carving have also noted that sometimes the carving areas were more temporary in nature and were preferably located near a water source.

Trails

Historical maps reviewed as part of this study identified a trail that extends along the southern boundary of the project area and the northeastern boundary of the Ka‘ū Forest Reserve (see Figures 29 and 30). The date in which this trail was established is unclear from the records reviewed in this study. However, an analysis of the historical maps included in this study shows that the boundary of the forest reserve may have been adjusted around the 1920s as early maps define the forest reserve boundary with a relatively straight line, and later maps show the boundary following the curvature of the “forest boundary trail” (see Figure 28). This trail connected with the network of other trails in Kapāpala, including the historic Mauna Loa and ‘Āinapō trails, both of which lie outside of the current project area and were utilized during the Precontact and Historic periods. Given the unusual curvature of the Ka‘ū Forest Reserve boundary, it is hypothesized that this trail may have been built when the boundaries of the forest reserve were formalized or that the forest reserve boundary followed a preexisting trail.

Caves

The *mo‘olelo* of Nānāele identified a cave system that reportedly extended from Ka‘alaiki to Kapāpala, specifically “a spot back of the Kapāpala stock ranch.” Furthermore, in the battle of Kaua‘awa, upland caves were used as a temporary refuge. Although the cave noted in the story of Nānāele is likely not within the project area, caves, which have historically been used for refuge or temporary shelters may be present in the project area.

Water Resources

Historical *mo‘olelo* namely that one involving Pele, Waka, and Puna‘aikoa‘e as well as historical maps have identified valued water resources in the vicinity of the KKCMA project area. Waka’s (who manifested as a *mo‘o*) passage through Kapāpala informs us of the presence of upland water resources and historical maps have identified several water holes in the vicinity of the project area including “Koiki Waterhole” (see Figure 31) located near the northern boundary in the upper portion of the project area, and another unnamed “Waterhole” further west outside of the project area. Based on the available maps, these two water resources are outside of the KKCMA project area. However, such resources, which have may have not been documented, may be present within the project area.

Ranching

Since the 1860s, ranching has been occurring in Kapāpala and by the turn of the 20th century until the 1900s was occurring in the project area. Although ranching is not considered a traditional cultural practice per se, it is recognized as an important Historic era practice and industry and is a big part of Hawai‘i’s history. Since the establishment of the KKCMA in 1989, ranching activities have ceased, however, ranching persists as an ongoing practice in the vicinity of the KKCMA. One of the consulted parties continues to work and manage Kapāpala Ranch and the remaining consulted parties shared their memories of the ranch or horseback riding in the area.

Hunting

Subsistence hunting was identified by several of the consulted parties as a practice that is ongoing within the KKCMA as well as within the adjacent forest reserves and sometimes illegally on the ranch. Like ranching, hunting feral pigs, as well as other game, whether for subsistence or sport is not considered a traditional cultural practice per se (see Appendix B for Maly et al. (n.d.) for discussion on the traditional role of pigs and the practice of hunting feral swine in modern Hawai‘i). As put forth by Maly et al. (n.d:4):

The *pua‘a* plays an important role in Hawaiian history; from their early position as a domesticated food source and important cultural symbol, to their more recent role in recreational and subsistence hunting, they have become a part of local culture...As with all resources, proper management and application is the key to maintaining balance.

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Game hunting, nonetheless, remains an integral practice to those families who rely on the meat for subsistence purposes.

RECOMMENDATIONS AND CONCLUSION

It is evident from the information presented above that the upland forest of Kapāpala has been utilized since the Precontact and Historic periods for a variety of practices one of which included the harvesting of *koa* for the construction of *koa* canoes. All of the consultees unanimously felt that the sustainable harvest of *koa* from the KKCMA for the construction of *koa* canoes used customarily for fishing, outrigger canoe racing, and voyaging would likely net positive impacts on the customary practice of *koa* canoe making. Furthermore, nearly all of the consulted parties spoke about the importance of responsible human interaction and management with forest resources as a way to mitigate further loss and improve connection and respect for such spaces.

The harvesting of *koa* for the construction of *koa* canoes has for many generations persisted quietly. In speaking with carvers who have the knowledge and capacity to transform a log into a useable canoe, they expressed sincere concern about canoe carving as a dying art with just about a handful who continue to practice. They spoke about the challenges of obtaining a suitable log and having to work with various landowners, all of whom impose different restrictions on the carvers. Because of the difficulties in obtaining a suitable *koa* log, the carving of a canoe is often left to the experts with little room to include upcoming carvers who so very much need experience in working with *koa*. We must remember that Hawai‘i’s *koa* forest has for hundreds of years sustainably furnished native carvers with the materials needed to make canoes. It was precisely the canoe that allowed early Polynesian voyagers to cross vast oceans and establish Hawai‘i as their permanent home. The canoe allowed them to travel from place to place around these islands, engage in inter-island warfare, and procure food from the shallow and deep seas. Its importance in Hawaiian culture cannot be understated. Thus, our actions today, or lack thereof, will play a role in the future of this practice.

While the overall goal of the project is promising for the perpetuation of traditional *koa* canoe-making, the methods and processes by which this project is implemented must be thoughtfully considered. It is in these actions that potential impacts on cultural resources and traditional customary practices can occur—including the practice it is intended to support. Given that this is the first project of this nature in Hawai‘i, the State must explore traditional and non-traditional methods of forest management. New partnerships must be forged, existing partnerships improved, and strategies for sustainable funding to manage the KKCMA must be sought. For a project of this nature, DLNR-DOFAW must draw upon traditional and scientific knowledge equitably to strike a balance that will sustain the resources, including *kānaka* on this ‘āina. The following recommended actions are intended to prevent or mitigate any potential impacts on the above-identified valued resources and cultural practices.

Dedicated KKCMA Staff

As noted by nearly all of the consulted parties, to properly steward the KKCMA, it is strongly recommended that DLNR-DOFAW seek the appropriate avenues and funding to hire at least one full-time staff member dedicated to managing the KKCMA and other relevant activities. Taking such actions would ensure there is adequate support to facilitate access into the KKCMA, reduce potential impacts to the area’s resources and associated practices, and reduce any potential confusion among DLNR-DOFAW and the community.

Archaeological Survey

To identify and protect historic resources that may be located in the KKCMA project area, it is recommended that an archaeological survey be conducted. An archaeological survey of the entire property is preferable, however, such surveys may be conducted incrementally. DLNR-DOFAW must consult with the DLNR-State Historic Preservation Division to determine the proper scope of the survey area. At a minimum, an archaeological survey should be undertaken once a potential harvest area is defined and before any harvesting activities are carried out. This recommended action will ensure any historic resources (i.e. potential settlements, caves, trails, or ranching era resources), potentially located within the harvest area are properly identified, documented, and protective measures are implemented. Areas, where historic resources are identified, should be demarcated on a map and made identifiable in the field. Efforts should be made to preserve in place all historic resources that may exist in the KKCMA project area.

Use of Traditional Place Name

As noted by one of the consulted parties, efforts should be made to utilize the traditional place names. The authors of this study also recommend that Hawaiian environmental zones (*wao*) also be utilized. Such traditional names should be utilized throughout planning documents. If there are plans to erect any sort of auxiliary facility or develop any special program(s) to aid in the management of the KKCMA, it is recommended that the traditional place names be utilized and

incorporated into such efforts. Proper utilization of place names and perhaps even the names of former *konohiki* is one way to ensure the place-based knowledge of Kapāpala is carried forth into the future.

Improve Fencing

Although cattle fencing currently demarcates the perimeter boundary of the project area, it is recommended that DLNR-DOFAW improve fencing to prevent or limit feral pigs from entering the KKCMA. This action will improve the protection of the KKCMA forest and prevent or limit unwarranted destruction to the forest.

Education and Stewardship Opportunities

The development of educational and stewardship opportunities was one of the most prevalent themes that emerged from the consultation process. For a project of this nature, such opportunities could help with both the short and long-term success of the KKCMA by building community support and stewardship capacity. It is recommended that the State:

- Partner with a reputable organization(s) that has the capacity to carry out such activities; that this organization is a Ka‘ū-based organization or at the very least, be well acquainted with the resources and Ka‘ū community.
- Develop an educational plan that promotes both short and long-term cultural and environmental education and stewardship specific to Kapāpala and Ka‘ū.
- Allow for community involvement in educational and stewardship opportunities.
- Strongly encourage or even require *hālau* who receive logs from the KKCMA to participate in such educational and stewardship activities.
- Stewardship activities should consider some elements of silviculture treatments to ensure the *koa* trees growing within or may be replanted within the KKCMA are cultivated in a way that makes them suitable for canoes.

DLNR-DOFAW and the organization may help to seek both internal and external funding to support such efforts.

Reciprocation

As articulated by several of the consulted parties, an appropriate form of reciprocation is strongly recommended. Traditionally, the removal of *koa* from the forest was a significant undertaking that required proper protocols and offerings. Reciprocation can take many forms including strongly encouraging or requiring those *hālau* who receive a *koa* log from the KKCMA to provide some form of give-back. This could include but is not limited to making culturally appropriate offerings, participating in educational opportunities, and encouraging *hālau* to assist with stewardship activities to help care for the forest resources.

Formalize the Existing KKCMA Working Group or Establish Another Working Group

It is recommended that DLNR-DOFAW consider formalizing the existing Working Group or establishing a new working group that would help consistently guide the implementation portion of the project. Such a working group, amongst other things, can help ensure appropriate cultural protocols are being followed and advise on any planned education and stewardship activities. Such a working group could consist of carvers, *kūpuna* and *kama‘āina* of Kapāpala and Ka‘ū, canoe clubs, and other stakeholders.

Repurposing Inadvertently Destroyed or Damaged Vegetation

If during the harvesting process, certain native plant specie(s) are inadvertently destroyed or removed in such a way that the plant may not survive, DLNR-DOFAW should consider 1) gathering seeds or cuttings (if available) from that plant for propagation and replanting; and or 2) identify practitioners or Hawaiian cultural groups who may be able to utilize or repurpose that plant for other cultural uses.

Coordinate Harvesting Efforts

To prevent or limit unnecessary impacts on the valued forest resources, it is recommended that the harvesting of *koa* from the KKCMA be properly coordinated. Thought should be given to seasonal changes and bird nesting seasons. Given the topography of the access roads, which are subject to erosion, especially during the wet months, harvesting should be limited to the dry months to prevent machinery from skidding off the road and potentially causing damage to the forest. Coordinating all harvesting efforts to a particular time of the year will ensure there is minimal disruption to other planned (i.e. education or stewardship activities) or unplanned (subsistence or commercial gathering) activities and will allow the forest to rest and regenerate until the next harvest. Furthermore, when harvesting is to occur, hunting and any other activities in the project area should be temporarily suspended to prevent injury. The timeframe for

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harvesting should be developed in such a manner that it does not significantly disrupt other planned or unplanned activities. Ample notice should be posted at the entrance into the KKCMA and any other outlet notifying the public of any temporary suspension and planned harvesting activities.

Conclusion

In summary, the culture-historical background, consultation, and recommendations provided above are intended to ensure the activities associated with the KKCMA project do not adversely impact any of the above-identified valued cultural resources and traditional customary practices. While none of the consulted parties expressed any strong opposition to the proposed project, the concerns, and recommendations offered above are intended to help DLNR-DOFAW remain mindful of the cultural, social, and environmental uniqueness of this 'āina. Conducting background research, consulting with community members who so willingly gave their time and knowledge, and recommending practical actions to mitigate any potential cultural impacts are done so with the utmost *aloha*, for both the land and the people whose heritage is intimately connected to this landscape. If DLNR-DOFAW assumes ownership of their *kuleana* to implement the KKCMA project, we recommend that it be done so in the same spirit and practice. Failure to consider and implement the above-described recommendations has the potential to adversely impact the above-identified valued cultural resources and traditional customary practices. Likewise, a no-action alternative has the potential for further degradation and loss of the forest resources and the associated traditional customary practices occurring in the project area.

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APPENDIX A. KA WAI OLA PUBLIC NOTICE

CULTURAL IMPACT ASSESSMENT: KAPĀPALA KOA CANOE MANAGEMENT AREA, KA'Ū DISTRICT, HAWAII ISLAND

On behalf of the Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW), ASM Affiliates is preparing a Cultural Impact Assessment to inform an Environmental Assessment (EA) being prepared for the Kapāpala Koa Canoe Management Area located on Tax Map Key (TMK) (3) 9-8-001:014, Kapāpala Ahupua'a, Ka'ū District, Hawai'i Island. The primary purpose of this management area is to provide for the sustainable supply of koa (Acacia koa) trees for the construction of traditional koa canoes. Secondary management objectives include native forest and watershed protection, protection of forest bird habitat, collaboration with educational and community groups, and access for certain recreational activities.

ASM is in search of kama'āina (persons who have genealogical connections and or are familiar from childhood with the 'āina) of Kapāpala or practitioners specializing in kālaiwa'a (canoe carving). ASM is seeking information about the area's cultural resources and or cultural uses of the project area; and past and or ongoing cultural practices that have or continue to occur within the project area. ASM is also seeking input regarding strategies to prevent or mitigate potential impacts on culturally valued resources or traditional customary practices. If you have and are willing to share any such information, please contact Lokelani Brandt, lbrandt@asmaffiliates.com, phone (808) 969-6066, mailing address ASM Affiliates 507A E. Lanikaula Street, Hilo, HI 96720. Mahalo.

APPENDIX B. PIGS IN HAWAI‘I, FROM TRADITIONAL TO MODERN (MALY ET AL. N.D.)

Pigs in Hawai‘i, from Traditional to Modern

Kepā Maly, Benton Keali‘i Pang, Charles Pe‘ape‘a Makawalu Burrows

It is well documented that feral pigs ranging through Hawaii’s upland forests today bear little physical or cultural resemblance to the smaller, domesticated pigs brought to the islands by voyaging Polynesians. It remains a popular misconception that pigs are native to Hawaiian forests and that pig hunting was a common practice in ancient Hawai‘i. This paper will briefly compare the traditional role of pigs in Hawaiian culture with the largely western practice of hunting feral swine in modern Hawai‘i today.

Origins and traditional relationships

Pigs are not native to Hawai‘i. The first pigs were brought to the Hawaiian Islands by Polynesians as early as the fourth century A.D.ⁱ Skeletal remains of pigs and recorded traditional knowledge sources indicate that *pua‘a* (the Polynesian pig) was a much smaller animal than the feral pigs of today.ⁱⁱ Historical evidence and genetic studies trace the ancestry of these animals to wild Asiatic swine (*Sus scrofa* subsp. *vittatus*).ⁱⁱⁱ

Originally, *pua‘a* enjoyed a close relationship with their human families and rarely strayed far from the *kauhale* (family compound).^{iv} Well developed taro and sweet potato agriculture in ancient Hawai‘i was incompatible with uncontrolled pigs, and there is every indication that pigs were both highly valued and carefully managed sources of protein. *Pua‘a* were an integrated part of Hawaiian households, and the common presence of *pa pua‘a* (pig pens) reflects the controlled, physically compartmentalized nature of pig management in traditional Hawai‘i.^v

Notwithstanding, small populations of loosely controlled and free-roaming animals existed in ancient times. Traditional and historic evidence indicates that these animals remained largely domesticated, living mainly on the periphery of *kauhale* and extending into lowland forests. They continued to rely largely on the food and shelter provided by the *kauhale*.^{vi} This is because in pre-contact times, native Hawaiian forests were devoid of large alien fruits such as mangos and guava, and major protein sources, such as non-native earthworms, that would eventually support the large feral populations of pigs today. Without such fodder, these early roaming populations would have been chiefly dependant on people for their survival.

Western introductions and spread of feral pigs

In contrast, current feral pigs are largely derived from animals introduced after western contact. Cook, for example, brought European pigs during his first voyage to Hawai‘i, and many other introductions of European and Asian swine followed.^{vii} Over time, the Polynesian *pua‘a* interbred with and were mostly displaced by these larger animals.^{viii}

As feral pig populations grew on all islands, they began ranging more freely in the forests. Concurrent but independent introductions of earthworms and introduced plant species, such as mango and guava, provided reliable protein and carbohydrate food sources and helped expand their range.^{ix} Omnivorous and without any non-human predators, pigs began to thrive in the native forest and successfully established large populations. Within only a few generations, any

escaped domesticated pigs reverted to a feral form, retaining the large body size of European swine, but severing their dependence on human beings.^x

With the advent of large-scale cattle ranching and sugarcane agriculture in the 19th century, much of Hawaii's lowland forests were converted into canefields or pasture, and feral pigs began moving further upslope.^{xi} Expanding development and agriculture throughout the 20th century further accelerated this process, reducing mid-elevation habitat and forcing feral animals into the pristine upland forests. Some areas, like the high elevation forests of the West Maui mountains, remained pig-free until as recently as the 1960s. Today, however, feral pigs are found throughout the main islands, including most of the remote native forests of Kaua'i, O'ahu, Maui, Moloka'i, and Hawai'i.^{xii}

Cultural implications

Clearly, domesticated *pua'a* carried strong cultural value in traditional Hawai'i. Aside from being an important possession and food source, a oral tradition describes the adventures of *Kamapua'a* (the pig child), a powerful demi-god who ranged over the islands and into the sea.^{xiii} Even the name of the traditional land management system, *ahupua'a*, refers directly to the *pua'a* and highlights the animal's importance among the variety of resources that were collected and offered during the annual *mahakiki* tributes.^{xiv}

However, pigs were never hunted game for ancient Hawaiians. The Polynesian interaction with these animals was one of near-complete domestication. Despite references to hunting rats with bow and arrow, no historic or traditional knowledge sources describe ancient Hawaiians hunting pigs for either food or recreation.^{xv} Even in the legend of *Kamapua'a* where the demi-god is pursued by man, he is sought so that he might be punished for his mischievous actions, not for sport or sustenance.^{xvi}

To understand the relationship between Hawaiians and pigs further, it is useful to examine the relationship between ancestral Hawaiians and their environment. Far more important than domesticated *pua'a* were the thousands of native plants and animals who represent the *kinolau* (physical forms) of the 'aumakua (ancestral deities). Ancient Hawaiians believed they were the familial descendants of the *akua*. The upland forest, or *wao akua* (realm of the gods), was held sacred, considered inhabited by the *kini akua* (myriad gods). As a result, these forests were kept religiously and physically distinct from the lowlands, or *wao kanaka* (the realm of people). In the *wao akua* dwelled such storied deities as Hina-ka-uluhe-nui-hihi-kolo-i-uka (Hina the great tangled mats of uluhe ferns crawling in the uplands), Hina-ulu-'ōhi'a (Hina-'ōhi'a-grove), Lono-i-ka-'owāli'i (Lono-in-the-'owāli'i -fern), Kumu-hea, (the caterpillar god of Ka'ū), Kū-'ōhi'a-Laka (Kū-of-Laka's-'ōhi'a-tree), Kū-pulupulu-i-ka-nahele (Ku-treefern-wool-in-the-forest), and Kū-'ālana-wao (Kū-[of the]-upland-offering), among the myriad *akua*.^{xvii}

As intensely sacred places, the forests of the *wao akua* were not entered except for very specific purposes, and then only by small groups of spiritually and culturally prepared individuals. Following strict traditional protocol, these groups would enter the forest for specific purposes, as to gather medicinal plants, fell carefully selected trees for voyaging canoes, or capture forest birds to harvest ceremonial feathers. In the native Hawaiian experience, human-reared *pua'a*

were considered denizens of the *wao kanaka* and alien to the sacred upland forests. Until the last 150 years, they were also largely absent from them.

Other ungulate introductions and impacts

Goats were introduced in Hawai‘i nearly simultaneously with the European pig, followed shortly thereafter by sheep, cattle, horses and donkeys. Introduction of this working stock accelerated the spread of western agriculture in the islands. This change, along with a growing westernization of traditional concepts of property rights and the decline of the Hawaiian population helped contribute to the collapse of traditional Hawaiian land management systems.^{xviii}

Other non-native ungulates were to follow. Axis deer were introduced on Moloka‘i in the mid-19th century and reproduced so rapidly that, by 1898, the population of axis deer on Moloka‘i was estimated at 7000 animals and hunters were brought in from California to cull the herd.^{xix} On Moloka‘i and elsewhere, Hawai‘i residents soon began to note the deleterious effects of large populations of cattle, pigs, goats, and deer. These introduced animals browsed, trampled, and rooted up sensitive native plant species, converting rich native forest into pasture land or worse. Together with unsustainable ‘ilahi (sandalwood) harvests, this animal-induced degradation of native forests took its toll and predicated the watershed crisis of the late 19th century.

Widespread fencing, feral animal control and forest restoration were undertaken in an attempt to reverse the damage. On June 22, 1878, King Kalākaua himself led a party to the headwaters of Nu‘uanu Stream to plant trees.^{xx} Surprisingly, despite these visionary early control efforts, state-sponsored game animal introduction resumed in the mid-20th century when the Department of Forestry was reorganized to create a game management division. Soon thereafter, mule deer, pronghorn antelope, and mouflon sheep were introduced for recreational hunting. Today there are six introduced species of game mammals.

Modern hunting: Incorporating western traditions

The custom of recreational hunting evolved over the last hundred fifty years as native Hawaiians assimilated western traditions in the context of these introduced game animals. The earliest descriptions of western-style hunting occur in the opening decades of the 19th century, when outings were organized to control wild herds of cattle that threatened agriculture, residences, and forest resources.^{xxi} The practice increased in frequency and in popularity, with island hunters playing a key role in the state’s response to the watershed crisis of the late 19th century. These state-sponsored control efforts resulted in the removal of over 170,000 introduced mammals in the first half of the 20th century.

Although hunting is not widely practiced in contemporary Hawaiian society – only two percent of the state’s residents obtain a hunting license – it is a visible and common occurrence across

Ungulate introductions to Hawai‘i (Tomich 1986)

- Polynesian pig – ca 400 AD
- European swine – 1778
- Goat – 1778
- Sheep – 1791
- Cattle – 1793
- Horse – 1803
- Donkey – 1825
- Axis deer – 1868
- Mouflon sheep – 1954
- Pronghorn – 1959*
- Mule deer – 1961

* Now extirpated

the state. Pig hunting, in particular, is a cherished modern practice for island sportsmen, including some whose subsistence depends to greater or lesser extent on wild game. Pig hunting in heavy cover is usually accomplished with the use of dogs, and the required training, feeding and care for these animals can be a difficult and expensive task. The dogs locate, chase, grab, or bay the game, which is then typically dispatched by the hunter with a gun or knife.^{xxii} These techniques are derived directly from western and European pig hunting practices, incorporated over the last 150 years in Hawai‘i, and passed down through family generations.

Striking a balance

The *pua‘a* plays an important role in Hawaiian history; from their early position as a domesticated food source and important cultural symbol, to their more recent role in recreational and subsistence hunting, they have become part of local culture. As we move forward in conservation, it is important that we understand this historical and cultural context to maintain a proper place for the *pua‘a* in modern society. As with all resources, proper management and application is the key to maintaining balance.

Today we face the continued destruction of native forest, and risk losing an irreplaceable natural and cultural resource to uncontrolled feral animals. Feral pigs are widespread in the world, and in no danger of extinction. *Pua‘a* were valuable cultural resources, but in ancient times were kept away from the *wao akua*, which held so much more value to Hawaiians than a single species such as a pig. As we strive to strike a balance between protecting native Hawaiian plants and animals and our dwindling native forests and the more recent practice of game hunting, we need to reassert the value represented by the *wao akua* to protect it and the *kini akua* for the future generations.

ⁱ Kirch, 1981, p. XX

ⁱⁱ Personal communication, SG reference

ⁱⁱⁱ Diong, p. 50-51; Clarke et al. p. 9; Giffen (1977)

^{iv} Maly, Kepa. 1998. Nā Ulu Lā'au Hawai'i (Hawaiian Forests), Kumu Pono Associates, p. 5.

^v Maly, p. X; Gon; but see "In the pre-European contact era, Polynesian man-pig interaction was essentially a loose one... pigs were never contained by any method. They were 'never confined in sites, but range about in search of food' (Ellis 1831, Vol. I p. 71). The pigs herded with dogs (Cook 1784, Vol. III p. 118) acted as scavengers, and were left unattended to roam freely and without restraint." (Diong p. 70)

^{vi} Diong, p. 73; See also: "Cook observed that pigs were abundant, formed an important part of the natives' culture, and 'were sometimes found wild in the mountains.'" (Diong p. 61)

^{vii} Beaglehole, 1967, p.

^{viii} Tomich, p. 123; Stone, p. 143; Diong, p. 61

^{ix} Stone, C.P. 1990, Feral Pig (*Sus scrofa*) Research and Management in Hawaii, pub info

^x Need citation discussing reversion to feral status

^{xi} Stone, p. 142; Diong

^{xii} Hess?

^{xiii} Kamapua'a lit.

^{xiv} Maly, Kepa. *Āina a me ke Kai: Hawaiian Land And Ocean Use Practices*, Kumu Pono Associates website: <http://www.kumupono.com/mahele.htm>, accessed 08 March 2007.

^{xv} Maly

^{xvi} Kamapua'a publications by Kahiolo, Charlot, Kame'eleihiwa, akana-Gooch, etc.

^{xvii} Maly, unpublished historical notes, Pukui & Elbert Glossary of Hawaiian Gods 1973.

^{xviii} Osorio 2002 Dismembering Lahui.

^{xix} Dorman, *History of Axis Deer in Hawaii*, 1996. University of Hawaii, website: <http://www.botany.hawaii.edu/bot350/1996/Dorman/dorman.htm>, accessed 11 March 2007.

^{xx} Cox, Thomas R. *The Birth Of Hawaiian Forestry: The Web Of Influences*, 1991, Hawai'i State Division of Forestry and Wildlife website: <http://www.state.hi.us/dlnr/dofaw/pubs/history.html>, accessed 01 March 2007.

^{xxi} Maly, p. 4

^{xxii} State of Hawai'i, Department of Land and Natural Resources, Division of Forestry and Wildlife. *Technical Report No. 07-0: Review of Methods and Approach for Control of Non-native Ungulates in Hawai'i*, 01 March 2007.