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# Kohala i ka Unupa‘a

**A Report for the Restoration Planning of Hawaiian Agricultural Sites in located in  
Wai‘āpuka, Kohala, Hawai‘i**

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**KOHALA I KA UNUPA‘A**  
**Hawaiian Studies 467 Mālama ‘Āina Field Methods Course Report**

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# INTRODUCTION

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## Project Description

Kohala i ka Unupa‘a is a Hawaiian Studies summer program done in partnership with Kamehameha Schools that was offered as HWST 467: Mālama ‘Āina Field Methods course. It was a four week intensive program (June 1- June 30, 2014) held in Kohala, Hawai‘i and it is designed for upper level undergraduate and graduate students. Through this course, student learned how class room learning intersects with ‘āina and how field methods help to bring these two components of knowledge together. The program provided a cultural framework to understanding in the following areas of Mālama ‘Āina research: historical research, community interviews, general survey, documenting and recording, mapping, data collection, and analysis. The course also had a strong community engagement component in regards to protocols, approaches, and sensibilities in working collaboratively with community groups and landowners.

The Kohala i ka Unupa‘a Summer program was under the direction of Dr. Kekuewa Kikilo and Kelley Uyeoka who had extensive background and experience in cultural resource management. Over the past six years they have worked to develop curriculum for training programs such as these through their non-profit Huliauapa‘a and business firm Nohopapa Hawai‘i. Since 2008, these organizations have successfully held field schools on the island of Hawai‘i with the explicit focus on training local kama‘āina and native Hawaiian Studies going into the fields of cultural resource management. Their approach diverges from a traditional archaeological field school to one that gave intensive training to advanced students in three approaches- historical, ethnographic, and archaeological field techniques and methods from a Hawaiian lens. The program also follows the work done previously by the Hawai‘i Historical Archaeological Research Project (HARP) and the University of New Mexico Anthropology Department under the direction of Dr. Michael Graves. Over the past ten years, the HARP program has done extensive work in the area and has done much to create a foundation of information regarding traditional Hawaiian land tenure and irrigated agriculture.

## Purpose and Goals

The summer program was open to undergraduate and graduate students at U.H. Hilo and U.H. Mānoa who are enrolled in Hawaiian Studies, Anthropology, or any cultural and natural resource related field or focus. The course enrollment was limited to 7 students selected through an application process which included completing all application materials and participating in an interview by the program selection committee. Students who were selected enrolled in Hawaiian Studies 467 and received a reduced tuition rate for this 6 credit course. Through the generous support of Kamehameha Schools, the program supported students in their accommodations, meals, and transportation during the four week period. They were required to participate in 40 hour weeks (M-F) for the course. In addition the students were mentored and developed a cohort research project and presented it at the local Society for Hawaiian Archaeology (SHA) conference in Hilo, Hawai‘i in October 2014. For their hard work

and dedication to the program, students also received a stipend for their successful completion of the course and participation in the professional development activities.

## Approach to Restoration of Hawaiian Cultural Sites

Hawaiian Studies as an emerging field is developing the mālama ‘āina concentration (lit. taking care of the land; resource management) to have an interdisciplinary focus that bridges the divide between western science and the indigenous culture. An explicit research agenda has been developed to understand our homeland as a model system that helped to structure varying biophysical contexts and production bases that eventually led to different types of human-environment relationships to be established across our islands. Our program has begun looking at the way water played an essential role in the development of our ancient food production systems and how it affected different trajectories of Hawaiian social political development and nation building.

In the rainy windward ahupua‘a of Kohala i loko (interior Kohala) widely dispersed networks of ancient irrigated pond fields have been documented that represent the nexus where pre-contact Hawaiian society and natural ecological systems influenced each other and evolved together over time. Through this process, the term “Kohala i ka Unupa‘a,” or “Kohala of the hard stone,” was coined referring to the resiliency of the people and place. Previous archaeological research done in the area helped to reconstruct our understanding of waterways and irrigation practices that occurred in the land areas of Wai‘āpuka, Makanikahio, and Pololū. The findings from these studies show that by A.D. 1450-1650 innovations in irrigation happened that allowed for waterways to cross ahupua‘a (social political land units) boundaries and link together seemingly independent entities into a socially integrated unit. At that time a majority of the dry table lands were transformed into irrigated lands through movement of water across boundaries and also by creating opportunities for water from the lower gulches to be brought up onto the higher elevation lands through extensive ditches and tunnels. These changes likely allowed for cooperative behaviors to emerge that became the foundation for a strong independent district identity. By 1782-1810, Kamehameha would use the support of this home territory to help in his efforts towards the unification of the Hawaiian Islands into a nation state.

Much of Kohala’s food production systems observed during the “pre-contact” period still exist at various states of preservation in the districts leeward and windward sections. In addition, the Kohala community maintains a strong connection to this ‘āina, with many of the community members having genealogical ties placing their families in the area. Many of the members of the community have experienced the consequences resulting from changes in land ownership and the accompanying changes to land tenure practices. Issues of local food sustainability and ecological and cultural protection of resources ranks high as a priority of the community that lives in this region, as there is a desire for many to return to the ‘āina and traditional farming methods to provide food for their families and their community. In this context the restoration of cultural sites, especially those that are related to the original pre-contact agricultural food production system that was created and built by the hands of the first peoples of Kohala, can be an important component for the restoration of community pride and helping them to reach their immediate goals of food independence.

The Kamakakūokalani Center for Hawaiian Studies encourages the continuity of these traditions by developing processes to help in the restoration of cultural sites, in this case agricultural sites that comprised the complex food production systems that sustained Kohala for hundreds of years. In at least some areas, the original infrastructure of these systems still exist and research and planning can help properly frame the role of Hawaiian knowledge in aiding and empowering our communities' efforts in reaching their future aspirations of sustainability, food sovereignty, and independence. The approach taken in this field program looked at three critical dimensions of information and knowledge in regards to restoration: (1) the oral and written records that exist in archival repositories; (2) the knowledge that existing in the living community that was passed down and practiced for generations; and (3) the actual bio-physical record itself as it relates to the environment and human made modifications and features on the landscape. This report represents the work done by students in the training program that looks at these three dimensions and uses this information in a planning process that evaluates the potential restoration sites for its strengths, weaknesses, opportunities, and constraints. By looking at these components within each dimension we were able to develop short and long term recommendations for the potential restoration of two pre-contact agricultural sites in Wai'āpuka, Kohala

The ahupua'a of Wai'āpuka, was chosen as the study location for this project because of its well-documented systems of agricultural terraces that exists in both of the main gulches and on some areas on the table lands. Kamehameha Schools owns portions of upper (mauka) Wai'āpuka and the lower point of 'Ākokoa along the coast, and is currently leased to Surety Corporation. The lower middle portion of Wai'āpuka is owned by Surety Corporation (previously Chalon, and originally Kohala Sugar Co.) the largest landowner in Kohala, as well as three individual small property owners. Since most of the ahupua'a was surveyed, mapped, and all potential pre-contact archaeological sites were likely identified, a site conditions assessment framework was prepared and implemented at two primary sites within the ahupua'a that were located on Kamehameha Schools land -WAI2 and WAI4W. . This report is a product of the work the students put in this summer program as an exercise in planning for the restoration of these two Hawaiian agricultural sites.

## ETHNO-HISTORIC SECTION

### Background-Ethno-historical Resources

The ethno-historical resources used during this program were collected prior since the nature of this type of research is time intensive and requires the research to have access to the archives and physical repositories of these documents. A thorough search and gathering of historical land documents was done that spanned traditional stories, accounts, proverbs, songs and chants, historical maps, land commission awards, native and foreign registers and testimonies, and boundary commission testimonies. Together these documents began to paint a picture of the important of the windward Kohala region, and in particular our study area – the ahupua‘a of Wai‘āpuka. It linked the cultural landscape to the story of its most important historical figure Kamehameha and gave insight as to the nature of traditional land tenure in the district.

### Story of Kamehameha

Throughout Hawaiian history, no single individual have had more socio-political impact than that of Kamehameha Paiea, who developed a strong independent district identity for Kohala and later an expansionist strategy which resulted in the unification of not just Hawai‘i Island, but the entire Hawaiian archipelago (1782- 1810). Kamehameha was the son of high chiefess Keku‘iapoiwa II of Kohala and it is there that he created a surplus of resource through the cultivation of the land and the creation of complex systems of irrigated and rain fed agricultural food production systems. Kamehameha is one of the most noted historical figures in Hawaiian history, yet few understand how truly beloved he was, admired for his ability to connect with the common maka‘āinana (i.e. farmers and fishermen) who provided the basis for his prosperity and military might. An analysis of the body of ethno-historical information regarding Kamehameha will show that investments in cultivation of the land and food production was ultimately what helped him rise to power. Also it was in North Kohala, that innovative ways emerged regarding water irrigation that helped increase the amount of food and support the district could provide the chief. Specifically, it is in the ahupua‘a of Wai‘āpuka, King Kamehameha’s legacy is maintained by ubiquitous evidence, recorded in documents, and seen on the land.

Kamehameha’s birth and legacy were prophesized by a well-known composer from Māui named Keaulumoku years before it actually occurred (Desha and Frazier 2000:26). In the chant, titled Haui ka lani, Keaulumoku told of Kamehameha’s birth and reign over the entire kingdom of Hawai‘i (Fornander and Thrum 1920: 368-372). It was predicted that a son of the chief Kalanikupuapāikalaninui would conquer over all the islands. Thus, when Keku‘iapoiwa II became pregnant with the son of Keōua Kalanikupuapāikalaninui, it was clear that this prophesized child was going to be born and it made many high chiefs concerned. It is said that during her pregnancy, Keku‘iapoiwa II craved the eye of the tiger shark (Handy and Pukui 1998: 245). Considering that the tiger shark was considered a metaphor for the chief of the sea, and that in order to satisfy this craving one would need to kill the tiger shark, many chiefs felt threatened that this chief would be the one mentioned in the prophesy who would take power from them. It was during Kamehameha’s birth at Kokoiki that the high chief Keawema‘uhili of Hilo suggested that it was best to “pinch off the tip of the young mulberry shoot.” By this he

meant that they should kill Kamehameha as a newborn in order to protect the power of the high chiefs. (Desha and Frazier 2006: 26).

When talk of murdering this newborn chief spread, many lesser chiefs of Kohala, pledged their loyalty to Keku'iapoiwa and decided to take action to save the child (Desha and Frazier 2000:26). Nae'ole, a chief of North Kohala and dear friend to Keku'iapoiwa, took on the kuleana to flee with the newborn child and hide and protect him in refuge at 'Awini.

Living informants today (Cachola June 3, 2014) can still tell in detail the journey of Nae'ole and his fellow chiefs, in order to protect the newborn Kamehameha from the forces of Alapa'inui's men. Cachola (2014) mentioned a number of place names that commemorate this flight. Some of these place names are still used by the people of Kohala today including: Hō'ea, Hāwī Honomaka'u, Kapa'au, Halā'ula, Hālawa, Makapala, and 'Awini, the furthest and most marginal point of Kohala bordering the district of Hāmākua. All of these place names documented different events that occurred while Nae'ole and his entourage traveled through North Kohala to the inaccessible plateau of 'Awini to seek refuge. They speak of the difficult journey, and the terrible offense they were committing against Alapa'inui, the high chief of Hawai'i Island at the time. Not long after Nae'ole and the newborn Kamehameha escaped to 'Awini, was Alapa'inui made aware of Nae'ole's actions. In time, Nae'ole was named kahu over Kamehameha and became his guardian. It was from that time until the age of five that Kamehameha stayed with Nae'ole in Hālawa, North Kohala. He would spend most of his childhood and young adult life in the ahupua'a of Hālawa and in general the rainy valleys of North Kohala. When he had reached the age of five, Nae'ole returned Kamehameha to Alapa'inui without reprisal, and it was in his court that he would later be educated in the knowledge of war and politics (Kamakau 1992:69).

### Importance of Kohala as a Home Territory

It has been documented in a number of ethno-historical sources that Kamehameha often returned to Kohala at critical periods in his life to replenish his health and resources and strengthen his power base (Kamakau 1992; Desha and Frazier 2000). These moments usually happen when: 1) he needs to seek refuge because there is political turmoil; or (2) when he finishes military campaigns and returns to learn important protocol or training in regards to warfare and religion in order to elevate his mana; and (3) to arrange and form his armies. Examples of periods of political turmoil include when there is a civil war occurring between Alapa'inui and Kalani'ōpu'u and Kamehameha joined Kalani'ōpu'u's court and is trained under Kekūhaupi'o in the art of warfare (Desha and Frazier 2000: 28). This raised the attention of many high chiefs and Kalani'ōpu'u ordered Kamehameha to return to the land his birthplace in North Kohala to seek temporary refuge (Desha and Frazier 2000: 29). Also, when Kamehameha moved the Naha stone in Hilo, Kekūhaupi'o urged him to return to Kohala once again, because of his bold feat would place him in danger of the many chiefs plotting against him. Thus, Kamehameha heeded the words of his mentor and returned to Hālawa in Kohala and was once more welcomed by his beloved people (Desha and Frazier 2000: 94). Finally, when power shifted in Hawai'i Island, his cousin Kiwala'ō became the paramount ruler and Kamehameha was appointed high priest, where he returned to Hālawa, Kohala to build his first heiau Hale o Ka'ili.

In a number of accounts, Kamehameha returns to his home in Kohala after major battles to reinforce and strengthen his training and protocols. One story tells of how Kamehameha returned with his instructor, Kekūhaupi'o, to Hālawa in North Kohala. The reason for this



return was so that a famous chief Kaukoko could train Kamehameha and Kekūhaupi‘o in the art of the many-pointed spear (kā‘ili ceremony). Upon his arrival the people of Kohala, realizing the arrival of their beloved chief, wailed in greeting and showed their love and affection for him (Desha and Frazier 2000: 63). There were also numerous military campaigns that are completed, from which he returns to his home territory such as: (1) the battles between Keawema‘uhili with Keōua and Kamehameha, Kamehameha chose to retire his armies in Halā‘ula and Hapu‘u in North Kohala (Kamakau 1992: 126); also when he later waged battle on Ka‘ū and Hilo, his men were defeated once again and they returned to Kauhola in Hala‘ula with his counselors, chiefs and warriors, where they spent their time in farming and focusing on food production to replenish his powerbase (Kamakau 1992: 126-127).

Kohala also becomes a home base for Kamehameha in the formation of his armies. During Kamehameha’s early adulthood, Kekūhaupi‘o helps him form famous armies within Kohala. His armies were arranged into four classes. The first class were the warriors called “Ka Hauna‘ele,” under the command of Kalawa, a chief of Hālawa, North Kohala. The second class were the warriors called “Huelo-kū,” commanded by Puniawa an extremely proficient warrior. The third class were called “Ona Hema,” commanded by Honoli‘i, a famous warrior of Makalawena. The final class were called “The Mākini,” led by Kukalohe, from La‘aloa in North Kohala (Desha and Frazier 2000: 66). The decision that Kamehameha made to establish his armies and form his four primary regiments in Kohala shows how important this land was as his center of power.

### The Role of Food Production and Water to Military Conquest

The irrigated food production systems of windward Kohala played an important role in the push for military conquest of Hawai‘i Island. Desha and Frazier (2000: 99) explain at a key point following the death of Kalani‘ōpu‘u, Kamehameha was in Kohala focusing on building his army and provisions. He did so by constructing hālau to train his men in martial arts, while at the same time encouraging the people of the land to farm and fish. Desha and Frazier state that:

“He [Kamehameha] soon realized that the way to attract the chiefs and commoners was to furnish their calabashes with vegetable food (‘ai) and their meat dishes with fish (i‘a) and to make the men sturdy and ready for instruction in martial arts.”

Desha and Frazier (2000: 168) again emphasize Kamehameha’s making food production in Kohala a priority in order to increase his power base and ability to feed the people and armies. In fact, when the Island of Hawai‘i was politically divided and at war this is what he did:

“When he arrived there [Kohala], he quickly began farming, attempting in every way to increase agriculture in order to furnish his people with food. Perhaps truly, if war between himself and the chiefs of that side of the island had begun, his warriors would not have lacked for food to enable them to go to battle. This was a wise act by this famous ali‘i of Hawaii nei.”

Ultimately, the innovations in irrigated agriculture in windward Kohala played an important role in Kamehameha’s and his rise to power. In particular, one account tells of the innovation that took place in the ahupua‘a of Wai‘āpuka, with the completion of one of the most ingenious engineering feats in all Hawaiian in regards to irrigated agriculture. In Wai‘āpuka is located the actual tunnel quarries through bedrock known today as “Wai‘āpuka Tunnel” consisting of “19 vertical shafts dug through bedrock to the level of the stream and connected by a horizontal

tunnel.” (Tomonari-Tuggle 1988: 38). Most locals of Kohala consider Kamehameha to be the one who was in charge of the construction of the tunnel, and they refer to the lo‘i that were fed by this tunnel as Kamehameha’s lo‘i (Tomonari-Tuggle 1988: 38). This tunnel documented in the book *Native Planters in Old Hawai‘i: Their Life, Lore, and Environment* (Handy et al. 1972:529-530). It mentions the old terraces of Kamehameha, at the time buried underneath sugar cane. Handy et al. (1972) continue by mentioning the tunnel that was used to irrigate these lo‘i. The excavated ditch is described and documented as being approximately 200 feet long with 19 vertical shafts did not exceed more than twenty feet, and were separated by about nine to ten feet (1972:529-530). For Kamehameha to complete this task, demonstrates his ability to pull the community of Kohala together through his leadership towards completing large scale public works.

## Geography of Kohala District

The district of Kohala is located at the northern tip of the island of Hawai‘i and is distinct geographically from any other district within the entire island chain. Foremost, it is the only district that experiences both windward and leeward conditions considering the fact that it is surrounded by ocean on three sides. Within North Kohala, this has resulted in a division of the land into two subdivisions, which many locals and historians refer to as Kohala-i-loko, windward (or “interior”) Kohala, and Kohala-i-waho, leeward (or “exterior”) Kohala (Uyeoka et al. 2013: 25). The district itself is divided into two sections, north and south. South Kohala contains about seven ahupua‘a beginning at the ahupua‘a of Waikoloa and continuing until the ahupua‘a of Waikā. The leeward division of North Kohala contains about thirty ahupua‘a beginning at Waikā and continuing north until the ahupua‘a of Pu‘uepa. Finally the windward division of North Kohala contains about twenty-eight ahupua‘a beginning at Pu‘uepa continuing south until the ahupua‘a of ‘Āwini bordering the district of Hamākua. The geological divisions in Kohala are due to early volcanic activity, which is described in an account by Tomonari-Tuggle (1988):

“The land area which is now called the district of North Kohala was formed by two eruption series of the Kohala volcano, the first of five to form the island of Hawai‘i. Approximately 450,000 years ago Kohala Mountain first emerged above the sea. The older Pololū Series, composed primarily of primitive basalts and olivine basalts, with ash forming the parent material of much of the present soils, was followed by an erosional period during V-shaped valleys on the windward coast were carved and then filled by subsidence and emergence processes. The Hāwī Volcanic Series occurring from 60,000 to 250,000 years ago, followed this period of erosion and deposited primarily over a portion of the original volcanic dome” (1988: 3-4).

The Kohala region has two contrasting environments based on climate patterns that distinguish the northeast areas as wet, and the southwest areas as dry and arid. These environmental differences led to very different adaptation strategies to be developed regarding food production systems. In Kohala-i-waho the very dry landscape, led to the development of large-scale “mala” field systems similar to the ones that once existed in places such as the districts of Kona and Ka‘ū. This system involved the use of low stone wall alignments arranged in a grid pattern for a range of different purposes such as rain fed agriculture and animal husbandry. Ladefoged and

Graves (2008) state that the old Kohala Field System once covered an area of about nineteen by four kilometers, which spanned approximately 35 ahupua'a (2008: 277-279). The remnants of this system can still be seen today, when observed from a higher elevation. Kohala-i-loko on the other hand, was largely shaped by the abundance of rain, water, and perennial stream flow. Kohala-i-loko receives high levels of rainfall annually through climate and orographic processes. Tomonari-Tuggle (1988: 5) give the measurements of rainfall as such:

“High rainfall is centered over the head of the windward valleys, where the average annual measurement is 200 inches. At the mouth of the Honokāne Nui Valley, it is 60 to 80 inches, decreasing northward toward Hāwī, where it is 50 inches per year. On the leeward side, median annual rainfall is approximately 60 inches at Pu'u Hue, which is 579 m (1,900 ft.) above sea level and approximately 13 inches at Māhukona on the coast.

This excess of water over time has shaped and transformed the landscape of Kohala-i-loko, dividing the contiguous stretch of tablelands into discreet sections by numerous gulches, which later became the divisions between sociopolitical territories. These types of environments are unique to the southern portion of the Hawaiian archipelago where islands are generally younger geologically. On northern islands such as O'ahu and Kaua'i, they are generally segregated into regions by deep alluvial valleys that have created much of the arable land. In Kohala-i-loko, water runs solely through tributaries and the main streams down the gulches into the sea. There is much evidence however that water was being redirected out of the gulches into the tablelands to run across the open landscape to support the agriculture that was taking place in these areas (McCoy & Graves 2008). This is seen in a variety of sources such as registered maps, ethno-historical documents, and even the archaeological record.

Wai'āpuka is a narrow ahupua'a with sloped topography divided by gulches on the northeastern and southwestern borders. This ahupua'a is bordered by the ahupua'a of Niuli'i to the northwest and the larger ahupua'a of Pololū to the southeast (Uyeoka et al. 2013: 64). In a survey done by James B. Mann in 1921 by the request of Bishop Estate, he said that Wai'āpuka contains about 525 acres and is bounded by the sea to the north, by Makanikahio 2 on the east side, Niuli'i on the west side and the ahupua'a of Kehena 2 mauka, to the south. (Uyeoka et al. 2013: 64). Wai'āpuka is located within the Kohala-i-loko division, and was once a part of an extensive, highly productive agricultural system (Uyeoka et al. 2013: 59). The upland area of Wai'āpuka is considered to be kula lands (often referred to in reports as tablelands), and as Uyeoka (2013:59) quotes, “thousands of years of weathering and a rainfall that averages 100 inches per year helped produce Wai'āpuka ahupua'a's rich soil and Kohala's fertile agricultural fields.” Wai'āpuka's topography on the mauka end consists of numerous rolling slopes, which eventually diminishes to more flat table lands in the lower makai region. In the lower makai region there are a number of lo'i complexes and irrigated ditches, the remnants of which can still be seen today.

Uyeoka (2013: 65) states in a similar survey done by James B. Mann for the forest reserve of Wai'āpuka on September 7, 1921 that, “sections of the Reserve were covered with a thick mat of ferns and Hilo grass with plenty of young live 'ōhi'a and large guava trees.” Today, the scene at Wai'āpuka is much different. Much of what was once lush native 'ōhi'a forest is now overgrown with a variety of invasive alien species. These species include, but are not limited to, ironwood trees, Christmas berry, Java plum, lantana, guava and a variety of invasive grasses (Uyeoka et al.

2013: 66). The majority of lowland areas is covered with grass and is used primarily for cattle pasture (Ibid.). However, within Wai‘āpuka still exists many native varieties of ferns such as palapalai, laua‘e and ‘iwa‘iwa, as well as some other native plants such as ‘awapuhi, kukui, niu, ‘ōhi‘a, tī, and kalo grew wild. The majority of these plants are found in areas of pre-contact habitation, as well as near streams and areas of running water.

### Place Names of the Ahupua‘a of Wai‘āpuka

Place names, help Native Hawaiians maintain a strong sense of cultural identity and connection to the land. These names were recorded and passed down through memory from one generation to the next, eventually being documented in various traditional chants and stories of the area. Kikiloi (2010: 102) states how, “Hawaiian Island names, like all place names, are a vital force for the continuity and renewal of a cultural identity as it relates to the land.” Therefore, when contemplating of any type of restoration of place, it is important to fully gather and interpret the original place names of that particular land as it helps to understand the context of cultural landscape. For Hawaiians, their relationship to their land or ‘āina is the foundation for the entire worldview. Kikiloi (2010:102) continues by saying:

“The ‘āina sustains our identity and health by centering our attitudes, instincts, perceptions, values, and character within the context of our sacred environment. We, in turn, sustain our ‘āina and love them with generations of memories and experiences of enduring compassion.”

These names describe how the people of old viewed their land as a lasting home, and with these descriptions, one can attempt to understand the ‘āina from their perspective. By bringing back and using these same place names again, we maintain a strong sense of historical continuity with the past, and keep the cultural integrity of the landscape alive.

The majority of place names related to Wai‘āpuka were documented in writing within the various archival land records that originate from the privatization of land called the Māhele of 1848; as well as testimonies given post 1862 regarding ahupua‘a boundaries. Testimonies and maps provided a number of different types of information that allowed for the reconstruction of the cultural landscape of the area: (1) identifying place names; (2) understanding what types of activities people were doing at particular locations; (3) documenting the location of particular types of resources. In Wai‘āpuka, there were 11 individual land claims made by kama‘āina of this area during the time, and within these claims were numerous land/place names. The majority of place names, or ‘ili names, were primarily concentrated in the lower makai area where habitation and cultivation was primarily occurring, as opposed to the higher upland mauka areas where dense forests were prevalent.

Rivera (2013), she states that there are approximately 44 place names in Wai‘āpuka, including those with name variations. Within her findings, she discovered 9 ‘ili names, including those with variations. These include Inaihakue/Inaihaku/Inaihakui, Kukuipaa/Kukuihaa, Kiei, Kalihi, Makamaka/Nakamaka, Ahulamiki/Ahulaniiki, Paina, Kanalo, and Hanoi/Haii. She also mentions many other types of names regarding geographical locations or topographical features such as Ohilauli, a gulch within Wai‘āpuka; or Kīlauea was another name given to a pu‘u (hill) within Wai‘āpuka. The names of places that mark boundaries are also very mentioned within these many historical land documents, names such as Huamoā, Moana, Kaea, and Pua‘a. Some

of these boundary names also demarcate specific landscape points such as Palihai, a boundary at the edge of the Kohala Ditch Co.'s tunnel and Maa, a pu'u that divided two claimants' lands. Some kahawai (streams) mentioned such as Waikama, the main stream separating the ahupua'a of Niuli'i and Wai'āpuka, and Waikaina and Waikalae, two lesser streams.

All aspects of restoration planning depend primarily on understanding the geography and place names. Understanding these components of the cultural landscape allows one to intimately understand the nature of the land and how people adapted to it. Within Kohala, this knowledge is particularly important due to the diverse environments and the vast differences between the leeward and windward regions.

In the case of Wai'āpuka, the geography and location of features and resources within the ahupua'a gives evidence to the plausibility that agriculture and settlement was taking place in particular locations. The ethno-historical information provides enough evidence so we can understand these things. We also know from these sources that there was indeed a concentrated habitation occurring in the lower Wai'āpuka region. Acquiring the knowledge of land/place names has proven to be extremely valuable in a project such as this. These names give cultural significance to what would simply be insignificant geographic features without such. Furthermore, understanding the critical state of the many native plants of the regions should only further influence the efforts for restoration along with preservation. People in the past at Wai'āpuka saw this land as a cultural landscape, and this was the place where they lived and died. Nevertheless, when these names are used continuously, and are understood with the prior intention, an identity connecting people to land is preserved and strengthened.

## Traditional Hawaiian Sociopolitical Land Divisions

In traditional times the Hawaiian Islands and its lands were divided into manageable socio-political units created at varying scales. According for Kamakau (1992:19), it is Umi-a-Liloa, paramount chief of Hawai'i Island that divided the lands into these units in the A.D. 1500's. Later his son, Keawe-nui-a-Umi maintains the system of division but also creates the practice of land redistribution following the rule and or transfer of power from one chief to another. Through Umi's renowned system, which originated on Hawai'i island, it was presumably copied and spread throughout the archipelago reaching as far as Kaua'i (Handy et. al. 1991: 46). Throughout the main archipelago individual islands were termed mokupuni. Within each the mokupuni, the district scaled land units were created called moku or sometimes referred to as moku-o-loko ("districts within"), moku'āina ("divided land") (Malo 1951:37; Ladeford & Graves 2008:260). The term of these large districts being cut into moku is called 'okana. According the Handy et al (1991: 46), 'okana is the derived from the verb 'oki (to cut), with the principle suffix as ana. The island of Hawai'i was comprised of six districts or moku. It is hypothesized that the first developed and oldest moku of the six is Kohala (Uyeoka 2013: 25). These moku (island districts) were developed in the context of the growing power of Hawaiian chiefs and the need to have clearly defined political territories and boundaries for their independent chiefdoms (Ladefoged & Graves 2006:260).

The process of dividing the land into districts or moku, as well as smaller manageable units is well documented. There are a number of terms that are used for district that give the visual imagery of land being divided or set apart. In particular, of the Hawaiian terms 'okana as kalana

are also used for district. According to Handy et al. (1991:47), the term ‘Okana is a derivative of “‘oki ‘ana” to cut away. Also he states, “the word kala (from kalana) means to loosen or to release, and with the nominal suffix na added, the term would mean a thing loosened or released. Thus, the terms for land being cut into large subsections or districts is appropriately called ‘okana and kalana.”

The next smaller scale of land division is that of the ahupua‘a (lit. “Altar of the pig”), which has been stereotyped to represent a completely sustainable ecological and economic production unit. This however was likely not the case, as ahupua‘a ranged greatly in variation in size, configuration, and resource distribution. More importantly according to Ladgefod and Graves (2008), ahupua‘a also represent the territories associated with individual communities, comprising a population of interacting individuals, most whom would be more closely related to each other than to other individuals living elsewhere. Smaller functional subdivisions within an ahupua‘a were called ‘ili. The ‘ili were smaller land unit or parcels that were associated with smaller nuclear family groups. The ‘ili were also referred to as ‘ili āina, ‘ili kūpono (permanently belonging to families), ‘ili lele (allocated to the same family/ person in multiple locations) (Handy et al 1991: 49). ‘Ili was further divided into mo‘o, which were smaller plots of land worked by households. (Ladefoged & Graves 2008:261). The term mo‘o was sometime used for dry-taro and sweet potato however, it was primarily associated with wet-taro planting (Handy et al 1991: 50). The methodology of strict prohibitions and subsequent planning, lead to the product of subdividing the lands and managing the resources within those lands which benefited community in that area.

Recently, archaeological research in the ahupua‘a’s of Wai‘āpuka as well as Niuli‘i, Pololū and Makanikahiō, (Hawai‘i Archeological Research Project 2012), have verified that ahupua‘a model based on self-sufficiency and isolation likely did not fit in North Kohala. This is due to the variation in size in terms of land area (and arable land), differences in water availability, and access to shoreline. Thus, the ahupua‘a in this region demonstrate a wide degree of resource sharing and fluidity between boundaries.

## Environmental Ecological Divisions

While the ahupua‘a system was a series of sociopolitical unit of land that were generally oriented from mauka to makai, and whose boundaries followed natural land features such as rivers, hills and valleys that represent - man-made organization of resources; wao on the other hand were horizontal sections of land naturally divided into a series of ecological zones extended by elevation from mountain to sea or coast usually marked by different vegetation growth. According to Maly (2001: 3), there is an intimate relationship between Hawaiian’s and their environment, where customs and practices demonstrate the belief that all portions of the land and environment are related, like members of an extended family, each environmental zone was named, and their individual attributes were known. In addition, The elevation and expanse of different wao vary greatly from windward to leeward locations (Uyeoka 2013: 32). Below Table 1 gives a list of the named divisions or aspects of the wao.



Table 1. Different Vegetation zones as described in Handy and Handy 1972:56-57. See also *Ka Hōkū o Hawai'i*, September 21, 1917. (note that not all zones are found in Wai'āpuka).

Ke kuahiwi	The mountain
Ke kualono	The region near the mountain top
Ke kuamauna	The mountain top
Ke ku(a)hea	The misty ridge
Ke kaolo	The trail ways
Ka wao	The inland regions
Ka wao ma'u keke	The rain belt regions
Ka wao keke	The rain belt regions
Ka wao akua	The distant area inhabited by the gods
Ka wao lā'au	The forested regions
Ka wao kānaka	The region of the people below
Ka 'ama'u	The place of the 'ama'u fern [fern upland agricultural zone]
Ka 'āpa'a	The arid plains
Ka pahe'e	The place of wet land planting
Ke kula	The plain or open country
Ka 'ilima	The place of the 'ilima growth, a seaward, and generally arid section of the kula
Ka pu'eone	The inshore dunes [heaps of sand, sandy edge of the sea, or outer sand bar]
Ka po'ina nalu	The place covered by waves, where waves break [shoreline, sea-breaking]
Ke kai kohola	The shallow sea inside the reef, the lagoon [shoreline reef flats]
Ke kai 'ele	The dark sea
Ke kai uli	The deep blue-green sea
Ke kai pualena	The yellow [sun reflecting- sea on the horizon]
Kai pōpolohua-a-Kāne-i-Tahiti	The deep purplish black sea of Kāne at Tahiti

According to Handy et al (1991: 56), wao kanaka is an ecological region most accessible are most valuable to man. The maka'āinana were generally allowed access to all the various natural resources within a given ahupua'a (Kamakau: 1992). Resources in the wao kanaka and the wao lā'au provided materials such as koa, hala, mamaki, paper mulberry, kukui, yams, sandalwood along with an innumerable amount of other materials which were sought, found and worked by men in or from the wao (Handy et al 1991: 56). Wai'āpuka mauka has preserved its own early agricultural marvels as evidence by an extensive lo'i and man made irrigated system (Uyeoka 2013:32)

## Managing Hawaiian Ecological Zones

Wai is the word for freshwater and it was an essential element for life and survival in ancient Hawai'i. Freshwater was an important aspect of health for the environment and it was a component that was actively managed by Native Hawaiians. Handy et al (1991: 57) states that the duplication of the word water, waiwai (water-water), means wealth, prosperity, ownership, and possession. Therefore, an abundant source of water meant wealth for a land or a people. In traditional times the concept of ownership or possession of a land or water was foreign to a native understanding. According to Handy et al (1991: 63), water is a source of life to land and man, and weather for drinking or other domestic purposes was not possessed to any man, ali'i, or mō'i but rather "belonged" to ancestral gods, who's body form in was such as Kāne-i-ka-wai-ola (Procreator-in the-water-of-life), and Lono-wai-makua (the rain provider or father of waters). Because land and water was seen in terms of use, water rights were the base to the fundamental conception of property and law to the families who lived upon and cultivated the land.



According to Nakuina (1894), water rights were necessary for the active management of irrigated pond fields called lo'i. Lo'i were irrigated agricultural plots that were used to grow kalo (taro; *Colocasia esculata*), the primary staple of Hawai'i which once grew abundantly and prominently along streams as well as irrigated terraces, and depended heavily on an abundance of fresh water. 'Auwai were human created ditches that aided in the diversion of the flow of fresh water from one area to the next downslope. Often times these ditches were tapped from a main stream and extended out for long distances as water was diverted through complex agricultural system within a region. This diversion of water enhanced the landscape and improved agricultural viability of lands for domestic use and food production. 'Auwai were typically dug by hand from makai (ocean side) to mauka (mountain side) to account for issues of slope and adequate diversion routes (Handy et al 1991: 57).

The konohiki was the primary manager of the ahupua'a or 'ili, and was the one who controlled most water rights, awarded the quantity, and gave the proportion of water to each gardening plot or area of cultivation. Quantity of water was based on the amount of hands furnished by each land, distance from source of supply of water, and the amount of work expended on the 'auwai to the manowai (dam) (Nakuina 1894: 80). These water rights ensured fairness among the people who worked and lived on the land as well as ensuring the continual flow of water in order for the integrity of the land to prosper by being agriculturally abundant, productive, and sustainable.

### Wai'āpuka's Enhancement of Water and Food Production

According to Tuggle and Tomonari (1988: 14), the windward valleys of Kohala were settled and intensively cultivated by the late 16<sup>th</sup> century. Continual population growth and expansion required a more elaborate mechanism for the management of the land and its resources. Ethnographic accounts of agriculture and water management in windward Kohala demonstrate a variety of innovative strategies employed to sustain the growing societal needs. The lands of the interior portions of North Kohala typically stretches of higher tablelands divided by deep gulches. The top of these table lands (also called "kula lands") were formerly grassland and used for dry land cultivation, where the grass was burned over, the stubbles were dug and all was allowed time to rot in the ground which prepared the ground for planting taro. Dry land crops included wild taro, sweet potatoes, bananas, and cane (Handy et al. 1991: 528). Overtime, these table lands were irrigated and crop growth diversified from only cultivating dry land crops to include also areas for wet land-taro. According to Nakuina (1894: 83), sugar cane and bananas were almost always planted on lo'i banks so to ensure a sufficiency of moisture from the seepage or ooze between them. According to Handy and Handy (1991: 531), a modern Hawaiian taro planter who cultivated terraces near Wai'āpuka started his cuttings in dry land and then transferred them to his terraces. These terraces for wet taro cultivation were developed a mile or more inland. They were situated wherever water could be delivered from streams or diverted from springs into an 'auwai; Thus, the water flowed downhill to the lo'i very gradually causing a minimum amount of erosive damage (Abbott 1992). According to Handy and Handy (1991:529), there is an account in 1935 of a group of terraces still being cultivated a quarter of a mile above the road in Wai'āpuka by a Hawaiian family. Just above this area, a particular large group of old terraces was irrigated by a ditch from Nene stream conducted through a tunnel in a ridge. This

area given to a Samuel Parker from Kamehameha I and cultivated during the latter part of his reign.

## Māhele ‘Āina- Change of the Traditional Land Tenure System

The 1848 Māhele was established to guide Hawai‘i in its transition from a traditional system of land use to a western model of privatization of property during the reign of King Kamehameha III Kauikeaouli. The traditional Hawaiian land system previously existed within the context of a highly stratified hierarchy and social order, a self-sustaining model of ahupua‘a management and use, and a communal and subsistence based economy which worked effectively for the people for generations. The traditional land tenure system was based on a reciprocal relationship which derives from the lesson of malama ‘āina (to care for the land). It is derived from a cosmological worldview that Hawaiians have a genealogical connection to the land. This relationship is defined by the kaikaina- kua‘ana (younger sibling-older sibling) reciprocal relationship (Kame‘eleihiwa 1992: p.25). The land and water was not owned in any legal sense, but revocable rights to its use were allocated and reallocated from the mō‘ī (king or paramount chief) down through the ranked system of ali‘i (lower chiefs) and finally to the maka‘ainana (commoners) (Tomonari-Tuggle year 1988: 25). Therefore, this historical event introduced the foreign concept of private property and fundamentally changed people’s relationship to land. During this process tenants of the land were required to document their claims to specific parcels in order to gain permanent title. The application process required claimants to provide a native testimony, foreign testimony, and native or foreign registrar. These records of the historical Land Commission Award (LCA) documents provide firsthand accounts of residency, resources, land use, access, traditional and customary practices of the lands they lived and actively cultivated from late pre-contact history into the period of the Kingdom of Hawai‘i.

Historical land documents from the Māhele contain useful and relevant information in regards to understanding traditional Hawaiian land tenure and the transformation of this system into one based on land privatization. which help create context and narrative about the land in Wai‘āpuka. The Land Commission Awards (LCA) documented the size of the land, the sale of the land, award number, and royal patent number. The native and foreign registers were written by the claimant and provided information about the claims to their land. The native and foreign testimonies were written by other people, who acted as witnesses to the claimant. In Wai‘āpuka, majority of testimonies were given by the claimants surrounding neighbor, kama‘aina within Wai‘āpuka or ahupua‘a adjacent, or konohiki. The information from the native or foreign testimony about the claimant include a description of the location and what resources and structures were on the land which provide names of old villages, graves, wells, springs, caves, plants, planting areas, rocks, and peaks. The testimonies also provide context of the parcel in relation to surrounding lands and activities; and identifying who had given the land to the claimant, how long they worked the land, and agricultural features such as lo‘i, pasture land, dry land, and house sites (Del Fierro 2013: 5).

## Wai‘āpuka Land Commission Award Overview

According to Uyeoka (2013: 265), a total of 125 Land Commission Awards were granted to both foreigners and natives in Kohala during the 1848 Māhele. In the ahupua‘a of Wai‘āpuka, there were total of 11 claimants for Land Commission Awards which concentrated primarily in the central makai region (Uyeoka 2013: 265-266; See Table 2 & Figure 1). Assumably eight of the eleven the names of the awardees include: J.P. Parker, Inaina, Kamaialii, Paku, Nihoa, Pi, Kauluahi, and Kaipukani. A total of 54 individual accounts of historical land documents associated with the establishment of private property in Wai‘āpuka were found & examined. There are a total 26 individual Land Commission Award documents (LCA), 8 Native Testimonies, 10 Foreign Testimonies, 9, Native Registers and 1 Foreign Register.

When looking at the Lobenstein map, lo‘i appeared to be clustered together near the stream indicating there was a high probability that it existed in a state of cultivation in the central makai area during that period. It is clear from the records and maps during the Māhele that the land was being used to cultivate crops such as taro and uala on table lands as well as working pasture land in that central to lower region. According to the land records of Wai‘āpuka, there was an estimated 130 lo‘i in production. In addition to this system of irrigated agricultural food production, other resources and landmarks are noted in these LCA’s awards, registers, and which included approximately - 6 kula lands, 3 house lots, 2 koele, 6 uala patches. However, this data does not represent the whole ahupua‘a of Wai‘āpuka but rather only an area within. Therefore there is a lack of record in regards to residency, land use and claims in the mauka and lower makai regions where more or less people may have once lived than actually recorded or awarded. When considering restoration it’s important to know the people and ‘āina through records. These accounts are rich with information regarding who once lived on the lands, prior historical use of the land, and helps us to understand how this unique ahupua‘a once functioned. Through these records it allows us to explore avenues on how to make the past relevant to today and maintain a sense of continuity in our identity.

**Table 2. LCA Awards, Claimant Names, and resources within the Ahupua‘a of Wai‘āpuka.**

LCA Helu	Claimant	‘Ili	‘Āpana	Resources & Landmarks	Awarded	Royal Patent
8713	Kaluahi	Inaihaku	1	- 5 lo‘i - 1 kula	1	7496
7712	Kekuanaoa, Mataio				2 in the ahupua‘a, Keokea	6852, 4485
8616B	Kamaialii	Kiei, Kalihi Lakai Kukuiha‘a	3	- 26 lo‘i - 1 kula	1	7952
511	Parker, J.P.	Makamaka, Nakamaka, Ahulaniki, Makanapa	2		1	37

8814	Kaipukani	Paina	2	- 31 lo'i - 1 houselot - 4 'uala patches	1 'āpana, 31 patches 4 houses	6250
10856	Paku	Pakai Kukuiha'a Kiei	4	- 27 lo'i	2 'āpana	7710
10865	Pi	Kamalo Kalihi	2	- 16 lo'i - 1 houselot - 1 Kihapai Pakanu - 1 'uala patch - 1 Kō'ele	1 'āpana	6522
10490	Nainaina (Inaina)	Kii Kukuihaa Haai Inaihakue, Makanikahio	5	- 25 lo'i - 4 kula -1 'uala patch - wall/fence	5 apana 3 houses	4719
10489	Nihoa	Kalihi	2	- 1 houselot -1 Koele poalima - Loko	1 'āpana 1 houselot, 2 workshops Ponds for konohiki	6488
10491	Nihoa	Kalihi	1		o (same award as 10489)	
1109	Kukuinui	Paoo	3		o (relinquished)	
8836B	Konia, L. wahine	Inaihakua	1		o (life long holding)	



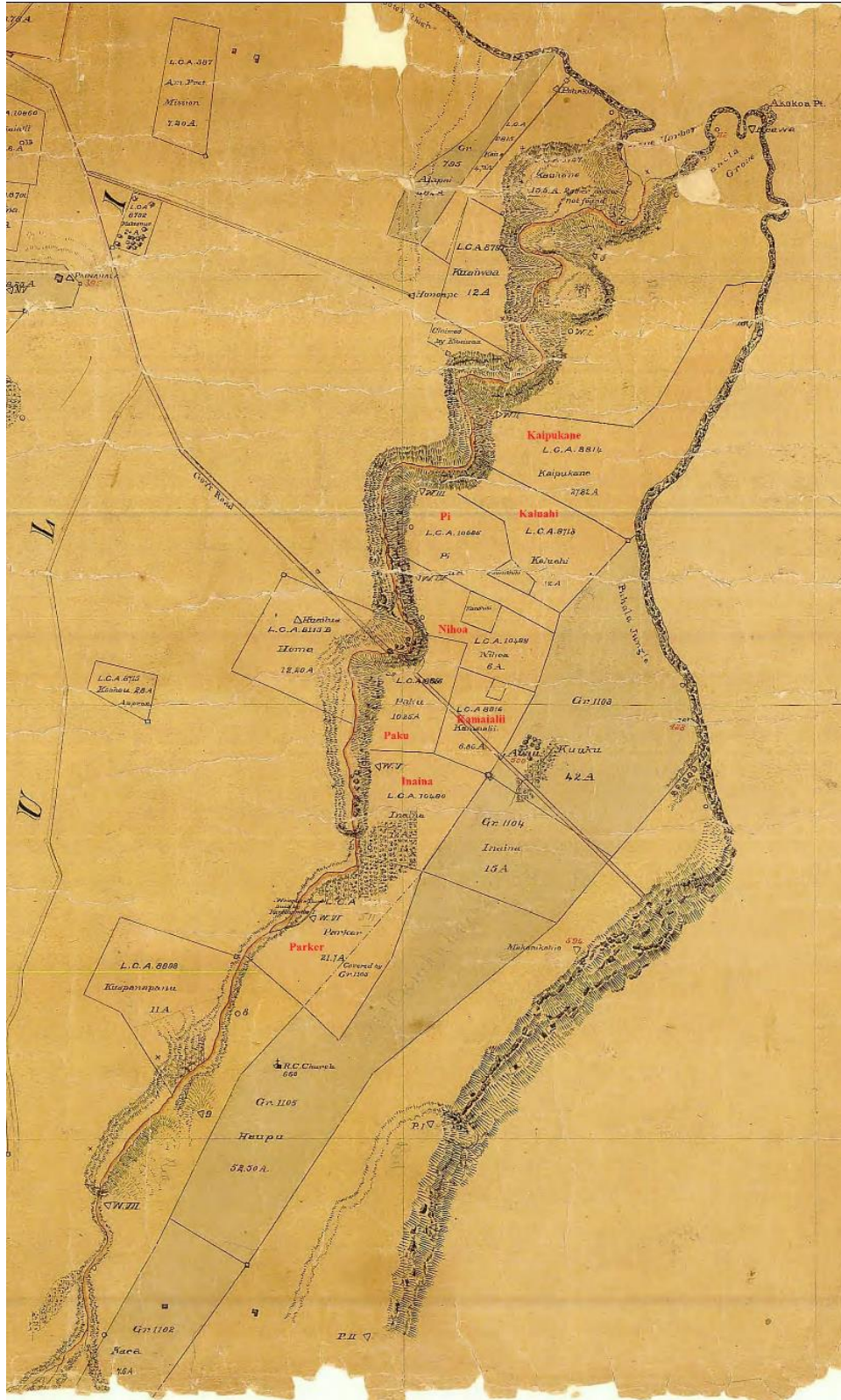


Figure 1. Portion of registered map 959 by Lydgate showing LCA's awarded to claimants in Waiāpuka.

## Boundary Commission Testimony Overview

The ahupua‘a of Wai‘āpuka in Kohala, was a land area was surveyed and submitted to the Boundary Commission on Nov. 22<sup>nd</sup>, 1873. The testimonies in this submission described placed pointed out by informants living around the area of Wai‘āpuka during this time, who very well may have been some of the last people to know details of the landscape. A native testimony was given by a man named Kuuku who was born on Maui but at time had lived in Kohala for 50 years and ‘Au‘au (an adjoining land of Wai‘āpuka) for 40 years. Kuuku mentions in his testimony that the boundary between Wai‘āpuka and Niuli‘i is the gulch, which at that time had water flowing through it. Kehena 2 is the southern (mauka) adjoining ahupua‘a to Wai‘āpuka. A name he provides is a place up the gulch called Nakoa, where Kehena and Wai‘āpuka cut off from each other. “Nakoa is on Wai‘āpuka and the boundary is mauka of it”. (Boundary Commission: 1873) It is noted in his Kuuku’s testimony that this particular area of land (Nakoa) is established by Royal Patents and by Certificate of Boundaries of Kehena.

Another native testimony was given by a man who was kama‘aina to Wai‘āpuka, however living in the Niuli‘i (the adjoining ahupua‘a of Wai‘āpuka). His name was Kahakuma and although he did not know his age at the time, he described being old enough and able to carry food during the time period of building of Kiholo. Kahakuma’s father, Komokoae, was his informant who showed him the boundaries of Wai‘āpuka. Points of demarcation and boundary he described feature of the gulch which starts at the sea shore between Wai‘āpuka and Niuli‘i, heading mauka up to the center of the gulch to the land of Kehena and says the boundary is in the woods and runs up the main gulch. He gives the name of this prominent point of the gulch near the junction of Kehena and Wai‘āpuka as Ohilauli. As opposed to the adjoining ahupua‘a of Wai‘āpuka boundary commission is short but provides information of points of demarcation, cultural sites, famous areas or reference, landmarks and prominent points on the landscape and some of the people living in the area. LCA and boundary commission together both enhance the narrative story of a land

## Themes and Discussion

The body of ethno-historical research helped us to understand the importance of Kamehameha to the region of Kohala and how Hawaiian land tenure happened in the past and how people adapted to the land. In the instance of Wai‘āpuka there is quite a bit of historical land documents as well as various accounts that help us to understand the nature of settlement and food production in the area. The importance of looking at these records tells the story of how the people survived in the ahupua‘a of Wai‘āpuka, and in the larger windward Kohala region. The traditional method of subdividing the lands and managing the resources within those lands benefited the communities in that area. While the land division of an ahupua‘a is stereotyped to represent a completely sustainable ecological and economic production unit, the ahupua‘a of Wai‘āpuka and its surrounding divisions of land in the region prove differ because of their tablelands divided by deep gulches demonstrating a wide degree of resource sharing and fluidity between boundaries or territories associated with individual communities. Lots of very detailed accounts from the actual people that lived here give evidence that crops were being grown abundantly. Therefore, they were innovative in the way they managed, worked and used their water.

We know that the windward valleys of Kohala were settled and intensively cultivated by the late 16<sup>th</sup> century and continued population growth and expansion which required a more elaborate mechanism for the management of the land and its resources. Following western contact, the Māhele was established and the traditional land tenure system based on the self-sustaining model of ahupua‘a management and use, and a communal and subsistence based economy which worked effectively was transformed to private property, fundamentally changing people’s relationship to land. These records of land commission awards, boundary commission testimonies and maps of Wai‘āpuka provide useful and relevant information to recount what existed on the land previously and insight to the people that once lived there. Evidence of the early agriculture marvel can still be seen today with the remnants of lo‘i parcels in Wai‘āpuka. This information becomes the foundation from which restoration discussion can begin for Wai‘āpuka and to allow the water to be irrigated and the region to become agriculturally abundant and productive once again.



## ETHNOGRAPHIC INTERVIEW SECTION

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### Background- Hawaiian Community Interviews

Ethnographic research involves gathering oral histories and conducting interviews with living communities to record and acknowledge peoples historical connections to place as well as document the visions communities have for their wahi pana (legendary and sacred places). Hawaiians have always maintained intimate relationships with their environments and through generating detailed stories about places; knowledge is passed on to future generations. In Kohala, many kūpuna and kama‘āina have maintained close connections to their ‘āina and have kept the stories of the landscape alive. The ethnographic portion of this study provides a means for the Kohala community to share their connections and stories as an essential and critical component of this restoration plan.

There have been three primary ethnographic studies conducted in Kohala. The earliest study by geographers from U.H. Hilo, Stephenson and Yoshima (1977) called Kohala Keia collected stories from the people of the district. Kohala Keia was a collected expression of a community focusing on the sugar plantation period in this region. Kohala Keia documents the era where the community transformed and diversified from a majority being of Hawaiian decent to the influx of new immigrants such as the Portuguese, Chinese, Japanese, Philippines, Puerto Rican, Scottish, and Spanish that sought to carve out a better life through work on the plantations. The blending of cultures allowed for a diversity to emerge in the types of food, practices, and religions practiced in this district. Kohala Keia also tried to incorporate aspect of Hawaiian culture such as older legends, chants, and hula specific to this community. The second ethnographic study was done by four kūpuna, Maeda et al (2010) and was called A Living Journals Collection: Four Life histories from North Kohala. The goal of this study was to preserve the social and cultural history of North Kohala through the oral histories of life-time residents from Māhukona, Niuli‘i, and Wai‘āpuka. Finally, the most recent ethnographic work that was conducted by Uyeoka et al. (2013) called Kohala I Ka Unupa‘a: An Ethnohistorical of Puanui, ‘Upolu, Kokoiki, Pu‘uepa, Wai‘āpuka and Honokāne. This research done for Kamehameha Schools included thirty-three interviews were carried out for this study focusing on themes such as Kohala’s historical of land use, mo‘olelo, cultural practices, natural and cultural resources and recommendations regarding future stewardship of these lands.

### Research Team

The ethnographic tasks for this study spanned from June 1 - June 28, 2014. The project team included: staff- Kekuewa Kikiloi, PhD, Kelley L. Uyeoka, MA, Joe Birkmann, MA, Kamuela Plunket, BA, and students- Melissa Tavares, Li‘i Bitler, Dee Castro, Jesse Kaho‘onei, Kepo‘o Keli‘ipa‘akaua. Lilia Merrin, and Pua ‘O Eleili Pinto. It was important for our project team to have sincere relationships with the community members we worked with because our end goal was to assist in the restoration planning process which will directly impact the Kohala community. The field school students, most of whom are Native Hawaiians or grew up in Hawai‘i, possessed a special understanding and appreciation of Hawai‘i’s rich history, environment, and culture that allows them to collaborate and work closely with communities in

a sensitive and culturally appropriate fashion. In retrospect, the professionalism and cultural sensitivity and awareness of project team helped ensure the forging of an understanding trusting, and genuine relationship with the community. While conducting this study, the project team integrated a set of cultural values and beliefs to help guide our research analysis, behavior, perspective, and overall frame of mind. The core values directing our group included:

- \* **Aloha ‘āina-** to have a deep and cherished love for the land which created and sustains us
- \* **Ha‘aha‘a-** to be humble, modest, unassuming, unobtrusive, and maintain humility
- \* **Ho‘omau-** to recognize, appreciate, and encourage the preservation, perpetuation, and continuity of our wahi pana (sacred places of Hawai‘i) and lāhui (nation)
- \* **‘Ike pono-** to recognize, feel, and understand righteousness, properness and goodness in all we do
- \* **‘Imi Na‘auao-** to seek knowledge or education; be ambitious to learn
- \* **Kuleana-** to view our work as both a privilege and responsibility
- \* **Pule-** to open the connection and communication lines to a higher source of power so that this work is intentionally guided

These values represented the underlying foundation, spirit, and structure for this study. It was the hope of the project that by providing a frame of reference and guiding values, the teams’ efforts would be better understood in the context of being indigenous researchers who have genuine and sincere interest in helping the community.

## Approach to Ethnographic Interviews

### Interview Process

Interviewees were contacted in early June 2014 through in person visits and phone conversations regarding the study scope and to determine if they were willing to participate in the study. Project recruitment and informational letters were distributed to the interview participants to inform them on the project and interview themes (see Appendix A). Ethnographic interviews were conducted from June 1 - June 28, 2014. Data was collected through semi-structured interviews with community members. Interviews were conducted at Wai‘āpuka, during site visits in Kohala, or at the participant’s home or work. The interview participants for this study were selected because of their knowledge regarding the land and resources of Kohala, specifically to the ahupua‘a of Wai‘āpuka, or they had experience undertaking restoration projects. Participants were also chosen because of their participation in previous studies, such as the Kohala I Ka Unupa‘a Ethnohistorical Study (Uyeoka et al. 2013).

The interviews that were conducted for this study were conducted in a “talk story” format to allow for a more informal dialogue and freedom of sharing. This style of interview is typically more comfortable for interview participants as it flows more naturally and does not follow a rigid structure. The interview questions were open ended which allowed for more freedom to answer but still kept the interview focused on the desired research outcomes. The questions were broken up into different categories including background information, community efforts and access, general restoration, Wai‘āpuka restoration, Wai‘āpuka specific questions, and knowledge sources. We started off with a set of seventeen questions (see Appendix B) however,

every interview took on a life of its own and specific questions were added or omitted depending on each interviewee. During our ethnographic interviews, participants took us on various huaka'i (site visits) in Kohala, which provided intimate place based learning opportunities. Often, the interviews were about specific areas and it was easier to understand the place while visiting them. The interviewee often brought supplemental material like old pictures or maps of the surrounding area for a visual learning. Being on the 'āina allowed for the stories to come to life in front of our eyes.

## Data Analysis

Each interview was audio recorded, then parts of it were transcribed and written into a summary. The summaries were then sent to the interviewee to review and to check for accuracy and to make sure that they felt comfortable with their thoughts being shared. The summarized interviews were then analyzed to pull out particular themes that relate to our project scope. The themes included:

- \* Current Community Restoration & Stewardship Efforts
- \* Land Access
- \* General Restoration Challenges
- \* General Restoration Recommendations & Opportunities
- \* Wai'āpuka Restoration Challenges
- \* Wai'āpuka Restoration Recommendations & Opportunities

The data gathered during the ethnographic interviews was evaluated to identify categories and reoccurring themes that emerged from the interviews. Various experiences, concerns, and solutions regarding land access, restoration, and stewardship were identified through analyzing the opinions gathered from interview participants. After the interviews were summarized, similarities and reoccurring themes were identified and pulled out to provide insights on how the participants viewed the major themes from the interviews. This analysis phase helped the research team explore, assess and recommend future land restoration options for Wai'āpuka.

## Informed Consent Process & Confidentiality

For this study, a comprehensive and detailed informed consent process was initiated and completed. This process was done through University of Hawai'i at Mānoa, Institutional Review Board. The IRB approval process included developing an informed consent form that was explained specific participant rights including notification that participants could choose to remain anonymous. The consent form included an introduction of the principal investigator and research team, the purpose of the study, the activities and time commitment, benefits and risks, privacy and confidentiality, and contact information (see Appendix C). Additionally, it was carefully explained to all participants that their involvement in the study was strictly voluntary and all participants had open and regular access to the researchers.

The audio recordings, transcriptions, and pictures taken during the interviews were kept on a password locked computer to ensure complete confidentiality. Information from the

participants was not to be used in any other studies unless the participant was contacted and gave consent. Furthermore, after the completion of this study, the audio files and transcriptions was planned to be destroyed unless noted otherwise. The information gathered in this study would only be shared with the participants consent. In some cases, participants requested that certain information remain confidential. During these incidents, project staff adhered to strict guidelines and protocols to protect the confidentiality of the information and to safeguard the identity of the involved individuals.

## Ethnographic Interview Themes

After reviewing the summaries of the interviews conducted with each of our community participants, five major re-occurring themes stood out as being of important concern to the community:

1. Current Community Restoration & Stewardship Efforts – Actions that the Kohala community are already taking towards restoring and perpetuating natural and cultural resources.
2. General Restoration: Concerns and Challenges – Potential factors that the community believes may hinder efforts towards restoration within Kohala, or Hawai'i in general.
3. General Restoration: Opportunities and Recommendations – Potential factors that the community believes may aid restoration efforts within Kohala or Hawai'i in general.
4. Wai'āpuka Restoration: Concerns and Challenges – Potential factors the community believes may hinder specific efforts towards restoration within Wai'āpuka.
5. Wai'āpuka Restoration: Opportunities and Recommendations – Potential factors that the community believes may aid specific efforts towards restoration within Wai'āpuka.

These five themes are listed below along with highlights from the thought and opinions gathered from our community interview participants regarding each theme.

### Current Community Restoration & Stewardship Efforts:

#### *Aunty Nani Svendsen*

Aunty Nani Svendsen created and continues to run Kukui Lo'i, which situated in the makai portion of Niuli'i ahupua'a. It has taken Aunty Nani over thirteen years to transform Kukui Lo'i from an over grown "waste land" into the thriving 'āina momona it is today. Restoration of Kukui Lo'i is not Aunty Nani's full time job, but she continues to work on her garden when she can, even if it's just for a couple of hours on the weekends. Over the years, more and more people have come to help her.

#### *Uncle David Fuertes*

Uncle David Fuertes and many others in the community developed the cooperative Palili 'o Kohala. The goal of this cooperative is to encourage the youth of Kohala to engage in educational programs and to preserve, protect and sustain 'āina and culture. In this county, 2% of state taxes

are allocated towards purchasing public lands. Uncle David explained that a lot of these lands being purchased are in the district of Kohala. The people of Kohala request a great deal of land because the community wants the land to maintain public access, have good churches and schools, and to develop affordable housing.

A goal of Palili 'o Kohala is to transform Kohala into a 50% sustainable district by the year 2018. Uncle David stated that the community of Kohala is extremely proactive in achieving this goal and is working hard to make it a reality. Uncle David described their plan to achieve this goal and referred to it as the "10 times 10 times 10,000 plan". This plan began with 10 families being given 100 huli each, with each plant producing approximately 10 more 'ohā upon maturation. Kalo, depending on the variety, matures in about 10 months, therefore after 10 months, 10 families planting 100 huli each will yield approximately 10,000 kalo plants. He continued to explain that even if the families gave away about half of the harvest and kept the other half to sell (5,000 kalo plants), they would produce about 10,000 pounds of kalo for market. As kalo sells for about six to seven dollars per pound, each family could make about \$60,000 a year. While this plan has great potential, Uncle David admitted that there have been some difficulties encountered such as families not working, not being able to produce enough kalo, and families giving away a majority of their harvest. Despite these challenges, Uncle David remains optimistic and confident that the project will be successful.

Uncle David utilizes natural farming methods to grow kalo and other plants at the farm. The main purpose of natural farming is to introduce microbes and all-natural fertilizers into the soil in order to produce the highest crop yields. Besides growing all-natural, organic crops, Uncle David also raises livestock such as chicken, pigs and cattle, and uses a natural method to feed this livestock.

#### *Kehau Marshall*

Kehau Marshall is the director of the non-profit organization Ulu Mau Puanui. The mission of the organization is to perpetuate and grow communities through culturally-centered sciences. These sciences include participatory restoration, research, and education focusing on traditional Hawaiian cultivation systems in the uplands of Kohala. They maintain three experimental māla where they teach youth about plants and planting techniques that are unique to the area. Their māla utilize the existing walls and berms that are a part of the ancient Leeward Kohala Field System.

#### *Uncle Fred Cachola*

Uncle Fred Cachola and his three daughters comprise are a family of scholars, and together they call themselves the Native Hawaiian Research 'Ohana. Collectively they have contributed a lot of research that demonstrates Kohala's historical significance.

### General Restoration Concerns and Challenges:

#### *Aunty Nani Svendsen*

Aunty Nani's challenges at Kuku'i Lo'i are primarily in following the complicated permitting processes and county regulations. For example, the long complicated process of filling out forms and then waiting for a reply from the county is tedious and cumbersome for individuals or small organizations to understand and maneuver through.

#### *Uncle David Fuertes*

Uncle David mentioned that the hardest challenge for farmers is getting good agricultural land with clean, flowing water. Uncle David also shared that it is difficult to acquire capital to fund restoration and sustainability projects.

#### *Kehau Marshall*

Kehau discussed a variety of challenges to farming at Ulu Mau Puanui. Puanui is located on the leeward side of Hawai'i where water resources are very limited. There are no streams in this area, so the only water available comes from rain and fog drip. Also, the strong winds that usually blow from the 'Alenuihāhā channel create harsh conditions for planting, growing, and maintaining Hawaiian food crops. Also, when the Ulu Mau Puanui project was starting, there were no historical accounts to be found that recorded the specific planting methods used for planting 'uala and kō at Puanui. Therefore, the planting process for Ulu Mau Puanui ended up being fairly experimental, and after planting on the existing mounds in the mala, they later discovered that the spacing they had used between the 'uala and the kō needed to be adjusted.

Kehau explained that the most challenging part about maintaining a restoration and farming project is finding funding sources and consistent volunteers. Funding for the project at Puanui comes from Kamehameha Schools (KS). While Ulu Mau Puanui greatly appreciates the funding, there is still a need for additional financial support to create more full-time positions so that responsibilities, like accounting, can be streamlined and the organization and the area that it restores may increase. Kehau stated that volunteer groups do not come consistently and it is difficult to find people to help work at Puanui on a regular basis. "Finding people that are connected to the land and genuinely care about the place is important."

#### *Uncle Fred Cachola*

Uncle Fred Cachola shared some of the difficulties he's experienced in restoring and maintaining cultural sites. One challenge is trying to figure out who owns the land. As mentioned prior, private land ownership and restricted access are big issues today. When Uncle Fred was a kid, people were able to travel to different parts of the district in the uplands and in the seaward portions with ease and getting in trouble for trespassing was not an issue. "Now, you constantly have to worry about trespassing" Uncle Fred stated.

Uncle Fred mentioned that it can be difficult to determine what a land owner wants to do with the land. This makes it challenging to engage the land owner in efforts to either save, restore, protect, or preserve significant features and wahi pana on the land. He explained that you must, "get the landowner to realize the importance of what they own, [be]cause sometimes, they don't

know.” Uncle Fred always tries to persuade the landowners to protect, preserve and mālama the cultural sites on their land.

Uncle Fred expressed concern about the limited access in Wai‘āpuka as well as the Kohala moku in general. “It’s not just Wai‘āpuka, it’s the whole Kohala coast.” He stated that the public is not widely aware of what areas are and are not legally accessible to them. Many people do not know where the public rights of ways are. He also shared that, “Sometimes Kohala people don’t care; if they want to go down to the beach, they just go. Where there were no gates and now there’s a gate, they just walk around the gate. If it’s not public, how do we get to the area anyway?”

Uncle Fred raised the question of “what is a public access?” Access along the ma kai side is very important because it is a traditional access route for fisherman. He mentioned that there are old traditional coastal trails that are still considered to be public access routes, but are hampered by legalities saying that people cannot use them, whereas generations before had experienced open and free use of them. He feels that “ma kai should be public access.” On the ma uka side, plantation cane field roads were once open to all people to access the uplands. Today, gates and private property prevent people from going into Wai‘āpuka unless they have a key.

Another issue that concerns Uncle Fred is the lack of kama‘āina knowledge and the effects caused by some archaeologists who have come into Kohala and speculated incorrectly on cultural sites that they have encountered. Uncle Fred shared an example at Pao‘o Ahupua‘a, where an ancient burial was mistakenly called a fishing shrine and a wealthy man nearly built his extravagant vacation complex next to it.

Uncle Fred has a slight concern with the range of different volunteers who come to work on the land that may have little experience in recognizing and protecting significant cultural and natural resources. While he does not seek to dampen a person’s zeal for wanting to help, he suggested that restoration efforts should encourage volunteers to help but try to prevent unintended damage through careful management. “How do you encourage and balance the sincere efforts of volunteers who have good feelings and respect about a site with their lack of knowledge about archaeology, protection and preservation of those sites?”

## General Restoration Opportunities & Recommendations:

### *Uncle David Fuertes*

Uncle David has been successful in developing and sustaining his programs by utilizing a concept he calls the three QP’s which are – Quality Program, referring to the quality of the idea to be implemented; Quality People, referring to those who intend to make the program happen; and lastly, Quality Partnership, referring to relationships between the local community, land owners, and when appropriate, people outside of the community.

He explained that all three “QP’s” are necessary in order to make something happen. When one of these is not functioning well, then the goal cannot be obtained. Without a well thought out quality program, a project will not have a strong foundation. Without quality people, the project or program will not be completed well. Without quality partnerships there is no connection and no supporting factors for the program. He also stated that it takes people that have compassion



to develop and sustain programs. Lastly he shared that successful projects need time to develop and that projects such as lo'i restoration, cannot be rushed.

Regarding specific lands that may be considered viable for agricultural and lo'i restoration, Uncle David mentioned that though land in gulches may be desirable due to their easy access to water, they are not the only places where agriculture may be possible. He stated that the upper lands of Kohala I Loko are also viable, and that crops have been grown in these areas for centuries. These upland crops are able to receive more sunlight, and as such result in stronger and quicker growing plants.

Uncle David is very supportive of including not only the Kohala community as participants in restoration projects within the moku, but to also include others who may possess the desire and right intentions. He said that if people have the passion to do it, then opportunities to aid restoration should be open to them. He also stated that a majority of the time, locals believe that only they can do it, but if an outsider has the same beliefs and values of wanting to kōkua, then they should be allowed to, as long as they are guided by the idea of respect for culture, the 'āina, and everything else that goes around it.

#### *Kehau Marshall*

Kehau Marshall recommends that KS should make a greater and more sustained effort to reach out to and involve the Kohala community to reconnect to lands in Kohala that KS manages. According to Kehau, Kohala should be the primary community for KS to target because of Kamehameha I's very close connection to the moku. She also suggested that more KS students and staff should come to Kohala, and in particular to Puanui, to learn first-hand about Kamehameha's one hānau (birth lands).

Kehau also explained that weather patterns are important to observe in a restoration area because they will help you to know when to plant and harvest. "Our ancestors knew when the rains were coming and when it was going to be drier than usual." To better understand the current weather patterns at Puanui, they have installed five weather stations. Kehau concluded that, "The more we learn about how our ancestors worked the land, how they used the resources, where they got their resources from, hopefully will lend to how we can maintain sustainability, self-sustenance, and food security."

#### *Uncle Fred Cachola*

Uncle Fred recommended that a regulatory agency, like a Kohala Historical Society, be developed. He explained that there is no community agency or organization who governs, regulates or manages and protects Kohala's cultural and natural resources. "Anybody can come in, tour the district and fool around with archaeology and field research on Kohala's cultural and natural resources." He shared that "if you look at Kohala's future, it's in its past. The best future for Kohala is in studying its past. The more that people learn of Kohala's past, the more valuable it becomes for the future... not only in terms of the Hawaiian cultural renaissance but for an economic renaissance, community renewal, and continued healing of these ancient lands."

Uncle Fred emphasized, “The big question is what we are going to do with these ancient lands in Kohala, and its unique cultural and natural resources?”

### Wai‘āpuka Restoration: Concerns and Challenges:

#### *Uncle David Fuertes*

When asked about cultural sites in Wai‘āpuka, Uncle David shared that he does not have too much knowledge about sites there due to the fact that much of the community does not have access those lands. Limited access to Wai‘āpuka, and the resulting lack of familiarity with sites there seems to be problem that is true for most of the community. However, the community is still interested in these cultural sites and is concerned about their disposition.

#### *Aunty Nani Svendsen*

When Aunty Nani was twenty-one years old, cattle ranching leaseholders built gates to keep cattle from straying off of their property, but this also blocked public access to Wai‘āpuka. One of the consequences of blocked access was that the roots of the trees along Waikama stream would become overgrown, entering the stream and blocking water flow. Prior to the blocked access, families who went ma uka to gather food would carry machetes and clear the sides of the kahawai preventing any blockage caused by vegetation overgrowth. This new blockage resulted in little to no water in two streams ma kai of the blockage that are typically fed by Waikama stream. This in turn affected the communities living in that downstream area who rely on that water to feed their crops.

The number of wild pigs and cattle in Wai‘āpuka increased because with limited access, it became difficult for hunters to maintain the pig and wild cattle populations at reasonable levels. Prior to restricted access, the wild pig and cattle in Wai‘āpuka mauka, were hunted by the community which helped to not only maintain the wild populations, but to also feed their families.

#### *Uncle Henry Ah Sam*

Uncle Henry Ah Sam stated that during plantation times access was “open, it was free. But after the plantation closed up, everything closed up. Private ownership came in, everything got fenced up. Gates started coming up, and that was a hard issue for the locals to accept, because as far as they were concerned they were free to roam.” The difficulty that he and his family have in accessing their old house lot, lo‘i, and cemetary is the primary reason that they have been unable to visit and maintain these areas as well as they would like to. Uncle Henry stated that the only person who has attempted to gain access to the area for clearing has been a person by the name of Diamond Ramond. However he was denied access by Surety as they felt that he had ulterior motives, wanting to use the access for hunting purposes.

Uncle Henry’s ‘ohana are buried in a family cemetary near the Waikama stream, as well as members of other ‘ohana including the Naihes. Two of his uncles are buried there along with his

grandmother, Rosalia Kealaka‘a. Uncle Henry shared that one of his ‘ohana’s primary kuleana is maintaining the barbed wire fence around the cemetery so that cows don’t intrude on the final resting place of their kupuna. Unfortunately, due to difficulty accessing the area, Uncle Henry and his family are only able to access the grave site approximately once a year. At the time of our visit, a portion of the fence was in disrepair. Uncle Henry shared that every three years the family has a reunion, and one of the main activities is to visit and care for this family grave site.

With very few family members left who are willing and/or able to care for their former family lands in Wai‘āpuka, Uncle Henry admitted that restoring the lo‘i can be a challenge. When he first left the islands to pursue his education, Uncle Henry had a desire to reopen this area when he returned, though this vision has been difficult to fulfill. However, as Uncle Henry stated repeatedly throughout our time with him, “It’s possible.” With determination and perseverance, this is one goal that can definitely be obtained. “Hard work, that’s it!”

#### *Aunty Daisy Naihe*

Aunty Daisy (Phillip) Naihe said that restricted access to Wai‘āpuka has been a problem in the past and continues to be a nuisance for her family. Located close to her family’s taro patches in Wai‘āpuka are her family graves. There are about six plots there, including her family (Phillip) as well as her husbands (Naihe). Their family tries to visit the gravesite once a year to maintain it. However, when they want to gain access to the area, they have to call Surety office in advance to let them know they want to access the cemetery. Although they’ve been able to obtain access to Wai‘āpuka from Surety, Aunty expressed that it is a frustrating and inconvenient process to have to go through.

### Wai‘āpuka Restoration: Opportunities & Recommendations:

#### *Aunty Nani Svendsen*

Among Aunty Nani’s recommendations for restoring Wai‘āpuka is the creation of a Hawaiian organization to restore Hawaiian cultural activities there. Wai‘āpuka always has cool flowing water and it should be used to grow kalo in lo‘i. Aunty Nani shared that other Hawaiian plants should also be grown there such as ‘awapuhi, hō‘i‘o, and hāpu‘u. However Aunty Nani believes that the most important thing to grow in Wai‘āpuka are people. Growing people means that people can reconnect with themselves and their roots. Many people today are lost and everyone has something that they need to recover from. Therefore, Aunty Nani acknowledges that they need a place where they can heal and reconnect to a higher power.

#### *Uncle David Fuertes*

When asked if there are particular places in Wai‘āpuka that stood out as being the most important for restoration, Uncle David stated that there would be places located near constantly running streams. These are the lands on the upper kula portions and in the gulches. He also

stated that sites located near the Kohala ditch may have the best potential for restoration. He shared that the locations with our project areas, and others located ma kai of the project areas are sites that he would like to see restored.

Regarding access to Wai'āpuka, Uncle David stated that if the place is managed properly and a structure is created where people sharing similar beliefs and values can gather and establish a strong foundation of trust between the land owner and the community, then public access could be possible.

One of the main suggestions Uncle David made regarding the restoration and reuse of Wai'āpuka is to start small. He explained that in order to make a big project happen, first those trying to restore it must start with just a small section of land. His second suggestion was to grow trees for windbreaks that may be harvested in twenty years for wood and other uses. A third suggestion was to create mulch from the many invasive alien species, and use them for natural farming and to create compost.

When asked, what he envisions for Wai'āpuka, Uncle David said, “to see the restoration of kalo and the diversification of other agricultural crops.” He would also like to see ranching of cattle. He believes that diversification of agricultural activities would aid in complementing the growth of one another. This diversification could be in crops, animals, and forestry. His last remark was that we need to look at how any specific plan for restoration can be sustainable by itself, for that is the true goal of Kohala. Uncle David explained how the land of Kohala, especially in the area of Wai'āpuka, has high potential and that with the combined action of the community, Kohala will be able to reach its goal of 50% sustainable in ten years.

#### *Uncle Henry Ah Sam*

When Uncle Henry was asked what he would like to see happen with the area in Wai'āpuka where his family lived and raised kalo, he stated that the area should be cleared out first, then what needs to be done can be seen. He explained that “everything is still there. The lo'i are still outlined.” The whole area is shaped in a triangle, and the water returns to the kahawai. For someone to just come out and clear the area would help a lot; perhaps encouraging others to continue working the area. “Opening a road to come in is not too hard” and would perhaps make restoration work even easier. Today, the old Phillip property is really overgrown, but Uncle Henry explained that it wasn't always that way. “I really think it can be put back, if people would come up regularly” to clear and maintain the area he stated. “And you look at it right now and say ‘Gee how are we gonna do it?’, but it's possible.”

Uncle Henry stated that if he were to clear the area, he would start by first clearing the roadway area leading to where the old house stood before. He would repair the road leading to it so that it would be easier to drive vehicles, especially trucks, closer to the work area. In this manner, it would be easier to remove any debris and vegetation cut down during clearing and would make continued efforts to restore and maintain the area much easier and more efficient. Alternatively, another good way to begin restoring the area would be to “drop down and let the water in” working on the po'owai, just ma uka of the lo'i area near the stream, and clearing the ditch (possibly 'auwai) that ran through the lo'i near the house area, subsequently feeding the lower lo'i, continuing past the house, and returning into the stream near the area of the road.

Considering the importance of the cemetery to families, as well as the desire for this site to be maintained, and for other areas such as the lo'i to be restored, Uncle Henry stated that whoever maintains the old Phillip property would need to be vigilant and “keep at it” in order to avoid any of these areas falling into disrepair again.

### *Aunty Daisy Naihe*

Aunty Daisy would also like to see their family burials in Wai'āpuka restored and taken care of. Her grandmother and brother are buried in a little gravesite near the Old Catholic church property. They have no headstones, but Aunty Daisy can still point out where the plots are. The owner of the property currently protects them from cattle with a fence, but the grass has grown high since the last time Aunty Daisy was there. She would like to see this area restored so that these graves are not forgotten.

When asked about possibly restoring the taro patches that she and her siblings once took care of, Aunty Daisy thought it was a great idea. She showed great excitement and energy in discussing her desire to restore the place that she once called her home and playground. When asked if she wanted to see a specific group or family take care of the area, she said that it would be nice for the people who have roots in Kohala to get back on the land, but she is open to anyone willing to take care of that area. Aunty Daisy stated, “If anyone is willing to go there, mālama the area and grow the taro, of course, it's a good project. You've got to kind of keep to what the old people went through, got to bring back those things. And if anyone is willing to build up that place that is a possibility.”

### *Uncle Fred Cachola*

Uncle Fred believes that restoration must be an ahupua'a-wide effort. He explained, “It's like redoing your house, and if you just redo the kitchen but not the hall or the bedroom.” In order to restore the ahupua'a as a whole, all landowners and community members need to sit down and create a single master plan. The idea of restoring Wai'āpuka to when it was at its most productive peak could be used as a model of how the restoration of traditional cultural practices and resources could also have economic value and viability. In doing so, such a plan restores not only the integrity of Hawaiian engineers and mahi'ai, but also the integrity of the land. To Uncle Fred, the entire relationship between human and environment entails not only physical restoration, but their spiritual restoration as well.

In regards to people working on restoring sites in Wai'āpuka, Uncle Fred suggested that groups such as the Kohala i Ka Unupa'a Field School would be great candidates. He considers cultural sites to be so important that it is critical for groups who are restoring or studying Wai'āpuka to be guided by professional resource managers and have a deliberate and thoroughly planned process. “It might give people a good feeling to get their hands in the dirt and cut a few trees or do something, but if you don't know what you're doing, you shouldn't be in there.” He would like to see legitimate groups, experienced managers, supervisors, and planners work with communities and do projects with a purpose.

Uncle Fred would like to see traditional food crops including kalo, ‘ulu, ‘uala and yams grown in Wai‘āpuka. In addition, he would like to see the restoration of the native habitat including native trees, and lo‘i. When Uncle Fred was asked about sources of information to help determine what crops were traditionally grown in the area, he recommended that we follow the lead of our kūpuna in determining what crops should be grown and where. “Look at what the kūpuna were doing, where did they go, and that tells you a lot.”

Regarding the Wai‘āpuka tunnel, Uncle Fred would like to see the stream restored and the tunnel cleared of all plantation diversion so that waters will continue to flow to its full capacity. He believes that if it is restored, the ability to reuse the tunnel will create a chain reaction to restoring other cultural resources in the area. Uncle Fred believes that Wai‘āpuka could set an important example for restoration efforts in Kohala.

Uncle Fred admits that the land “has been abused, and used for over a hundred years to grow one commercial crop – sugar cane...” However, because the land is healing itself, the land needs restoration leadership. Although the land must be allowed to heal, it also needs people to help it along. “At least we know what our kūpuna did to help it along; they diverted water, they made the land much more productive in a way that it could be sustainable.” He believes that Wai‘āpuka could be an example of how water was collected, distributed and managed by our kūpuna. With lo‘i and streams being restored, and by allowing the waters to flow again, Wai‘āpuka can potentially become the bountiful breadbasket that it once was.

Complete interview summaries can be found in Appendix D.

## Community Questionnaire and Information Gathering

### Questionnaire Methodology

The student researchers created and distributed an anonymous questionnaire in order to understand the wide range of perspectives on cultural restoration and sustainability within the Kohala community. The main goal of the questionnaire was to gather information from the kama‘āina and kūpuna of Kohala regarding their connection to land, the importance of sustainability, how they value the community, and to get their thoughts about restoration as a means to perpetuate Hawaiian cultural sites and practices. The expected outcome of this questionnaire was to develop a set of data that would help us to understand the various goals and desires that community members have for their natural and cultural resources, and to help inform the development of a restoration plan for Kamehameha Schools’ landholdings within Wai‘āpuka.

### Questionnaire Content

The students created questions that would lead to answers that could inform us about the values, practices, and visions of the Kohala community. Four major themes were developed for this questionnaire:

- **Land and Culture:** This section included questions regarding the importance of practicing Hawaiian culture in today’s world and the importance of having access to land and resources in order to perpetuate Hawaiian culture. The goal of these questions were



to help us to understand if Hawaiian culture and ‘āina are important to the Kohala community, and to what degree they may be important.

- **Community:** This section aimed to understand how much value people place on having a sense of community in Kohala. This section included questions that among other things, asked participants how strong they believed the community connection currently is in Kohala, and how important it is to them that their descendants continue to live there. This information was important in helping to determine what type of community capacity may exist for executing potential restoration projects.
- **Restoration:** This portion of the questionnaire was used to understand how important it is to the community to restore cultural sites and to gauge their level of interest in participating in restoration projects.
- **Sustainability:** This section was created to understand what type of efforts towards sustainable agriculture and economy the participants would like to see develop within the Kohala community. More specifically, these questions asked participants if they support traditional farming practices, and how interested they may be in cultivating farmlands to feed their ‘ohana and community. By asking these questions, we developed a better idea of what level of interest may exist for creating and sustaining restoration projects in the future.

Each student member of the group developed questions relating to these four themes. From this pool of questions, we selected the ones that would generate the most relevant information to better understand the thoughts and opinions of the Kohala community. A total of ten questions were selected and compiled into a questionnaire to be answered using a rating scale of 1-10: one being the lowest value, and ten being the highest value. Spaces to provide information on the participant’s gender, age, ethnicity, birthplace, and the number of years that they lived in Kohala were also included on the questionnaire.

## Questionnaire Data Collection

The questionnaire was distributed to the community on June 11, 2014 at the Kohala Kamehameha Day Parade Ho‘olaule‘a in Kapa‘au. Our research team set up an informational booth at the Ho‘olaule‘a where we displayed historical maps and research posters about Wai‘āpuka and the previous research that had been conducted there. As people visited our booth, they were asked if they were willing to spend five minutes to answer our questionnaire. Distributing the questionnaire at the Kamehameha Day Ho‘olaule‘a provided an opportunity to gather input from a diverse range of participants.

## Questionnaire Data Analysis

A total of thirty-three individuals completed the questionnaire during a four-hour time span. While this data does not represent the entire Kohala community, it does provide some insight into some of their perspectives on land, community, restoration, and sustainability. A data table was made to organize and represent the results of the questionnaire. The averages of the answers to each question were calculated and analyzed to produce a general understanding of where the Kohala community stood on particular issues.

## Highlighted Results

- **Land and Culture:** Answers to the question regarding the importance of access to land and resources to perpetuating Hawaiian culture averaged 9.4 out of 10. The results of these questions indicate that Hawaiian cultural practices are significant to the Kohala community, and that they have great interest in them
- **Community Results:** The question regarding the importance of the Kohala community received answers averaging 9.7 out of 10. Answers to the question regarding the strength of the current community connection in Kohala averaged 7.4 out of 10. Answers to the question regarding participant's descendants continuing to live in Kohala averaged 8.3 out of 10. These results suggest that a sense of community was important to participants, and that much of them would like their 'ohana to remain in Kohala, but the perceived connection between community members could be stronger than it is now.
- **Restoration:** The results for the question about the importance of restoring cultural sites averaged 9.2 out of 10. Answers for the question asking if participants would engage in restoration programs averaged 8.9 out of 10. These results suggest that the participants would participate in restoration projects if programs were developed. The results also suggest that may be a high probability that community members would get involved in restoration programs in Kohala.
- **Sustainability:** The averages for answers to questions relating to sustainability were 9.1 - 9.4 out of 10, which indicates that the Kohala community supports the idea of becoming more sustainable. These results also included the questions relating to people's desire to return to cultivating their own crops and performing traditional methods in order to carry out these tasks. The question that asked if participants would work on farmlands to feed themselves and their community averaged 8.9 out of 10, which suggests that the community would participate in farmland cultivation projects if given the opportunity to do so in Kohala. These answers indicate that participants support the idea of becoming more sustainable and may indicate a desire to return to cultivating their own crops using traditional cultivation methods. It seems that participants would also engage in other farmland cultivation projects in Kohala if given the opportunity to do so.

## Questionnaire Overall Results

Overall, the results from the questionnaire indicate that participants have a high level of interest in regards to land access, culture, community, sustainability, and restoration. The data collected presents evidence that restoration efforts would be beneficial to the Kohala community for educational, cultural and sustainable purposes and could be a positive solution to strengthen community interaction and connection through the perpetuation of Hawaiian practices such as mālama 'āina. The restoration of cultural sites is something that the community strongly desires and could be used as a model for perpetuating Hawaiian culture as opposed to preserving it as a stagnant record of past practices.

## ARCHAEOLOGY SECTION

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### Background- Archaeological Research in Kohala

The district of Kohala district has a body of archaeological research done for the region and also has some of the most-well preserved sites and areas in all of Hawai'i (HARP 2010: 14; McCoy and Graves 2008). The leeward coastline is lined with pre-contact fishing villages and portions of a large-scale rain-fed agricultural system, the Leeward Kohala Field system, spanning 70 square km over the landscape (Ladefoged & Graves 2011). The windward side of Kohala is also full of its own archaeological treasures with prehistoric agricultural terraces as well as a series of prehistoric drainages and ditches that extend from mauka to makai in both gulches and across the tablelands, a prime example of the ingenuity of Hawaiian hydrological engineering. Throughout the course of archaeological surveys done in windward and leeward Kohala, archaeologists have found the rapid expansion and intensification of prehistoric agriculture to be a display of the innovation of Hawaiians and one that can be used as a model for sustainability.

Beginning in the late 1960's, leeward Kohala became the primary focus of archaeological investigations, primarily because of the visible and well-preserved cultural resources that dominate the area. Lapakahi was identified early because it being one of the most well preserved areas displaying evidence for both dry land agriculture and utilization of marine resources (Rosendahl, 1994:14, 52-53). The area was full of habitation structures that comprise a once thriving fishing villages that native Hawaiians lived at, as well as having a large scale rain-fed agricultural system in the uplands of the ahupua'a. Early researchers focused on the subsistence patterns of the fishing villages in the coastal area, but later it shifted towards the upland area that was found to be densely populated with habitations sites intermixed within the Leeward Kohala Field System (HARP 2012:14). Eventually the focus on the investigations began to explore "adaption to marine and terrestrial components of their ecosystem (Rosendahl, 1994: 1-2)." With such a wealth of visible prehistoric archaeological sites in leeward Kohala, little attention was given to windward Kohala (Kirch, 2012: 164).

By the 1970's field research in the windward Kohala valleys began. The focus of their research was to understand intensive agricultural practices across the windward valleys. Tuggle (1980) conducted field schools in the deep windward valleys of Pololū, Honokāne Nui, Honokāne Iki, and 'Āwini (HARP, 2012: 43). The focus of their work in Honokāne included locating and mapping a system of irrigated agricultural terraces within the valley. Tuggle's work also shed light on the diversity of agricultural practices which dominated the Pololū valley floor, from intensive dry-field cultivation on the alluvial valley floor to irrigated pond fields (Tuggle, 1980: 305). Surface features of dry land agriculture included stone alignments or low embankments of rock and soil constructed similarly to that which was found in the Leeward Kohala Field system. In addition to dry land agriculture, irrigated complexes were also found in the valley, although fewer were found of the latter than the former due to limited water resources (Tuggle, 1980: 306). Tuggle had found through the course of research and excavation done by the field schools, that in most areas of Pololū, but not necessarily all, intensification and expansion of agriculture had taken place. They were the first to try and create a chronology of the settlement patterns of Hawaiians in Pololū. Later, the early work done in windward Kohala would inspire the Hawai'i

Archaeological Research Project (HARP) to extend agricultural research to other areas within this northern section of the Kohala.

More recently from 2006, the Hawaiian Archaeological Research Project (HARP) began their research on windward Kohala. From 2007-2011, HARP's study area spanned systematically through the eastern gulches and table lands of the ahupua'a from Hālawa to Wai'āpuka, looking closely at the streams and gulches and the development of intricate waterway systems, that included irrigation ditches, drainages, and evidence of food production complexes in both the gulches and table lands. These systems were "a testament to the ingenuity, creativity, innovation, and technical abilities of Hawaiians to solve resource procurement, extraction, and production challenges" (HARP 2010-2011:82). Knowing that soil nutrients were rather poor in these areas of heavy rainfall, they ingeniously brought water onto the tablelands for irrigated cultivation (HARP 2010-2011: 82). The elevation and length of some of these drainages were rather high and long, some as long as 500 m (HARP 2012:18), carving through slopes and bedrocks and crossing streams and drainages on the tablelands (HARP 2010-2011:82). Although some drainage were filled in and agricultural complexes destroyed by sugar cane cultivation, these sites were not totally destroyed and still existed in the subsurface deposits on the landscape (McCoy 2009, 2010; Graves et al. 2012). In addition to these discoveries, there was an effort to refine the chronology of settlement for the area (Field and Graves 2008). This work has pushed back the timeline for settlement for the windward region to the 12-13<sup>th</sup> century, creating parallels with the earliest dates from the Leeward Kohala Field System (Field and Graves 2008: 206,218; Tuggle and Griffin 1973:55-59; Ladefoged et al. 2005; Ladefoged and Graves 2008). This establishes that windward Kohala might have been settled first before even the coastal areas of the leeward section of the district (Field and Graves 2008:218-219). It also placed intensification and expansion of agriculture in the 15<sup>th</sup>-17<sup>th</sup> century (Field and Graves 2008:1).

## Context of Site Selection

The archaeological field component to this study drew upon the breadth of information and data already compiled by previous field seasons in the region. Since most of the ahupua'a of Wai'āpuka was surveyed, mapped, and all potential pre-contact archaeological sites were likely identified, a site conditions assessment framework was prepared and implemented at two primary sites within the ahupua'a that were located on Kamehameha Schools land -WAI2 and WAI4W. In general, these Wai'āpuka sites were suitable for this assessment because of its ease of access, the identified community need, and amount of documentation and previous research conducted there (Field and Graves 2008; McCoy and Graves 2008; Graves et al 2012; Graves et al 2013). The goal of this assessment was to determine the condition of the archaeological features within the two sites that had once been used for the cultivation of Hawaiian kalo (taro, *Colocasia esculenta*), as well as a host of other secondary Polynesian introduced crops. This section will go over the development of a site condition assessment form, logistics, fieldwork process, and post-fieldwork data management and analysis.

## Site Condition Assessment Criteria

In order to evaluate the existing conditions for restoring the focus sites (WAI-2 and WAI-4W) in Wai'āpuka, a conditions assessment framework was needed. An approach was adopted and

adapted from Monahan's (2014) report prepared for Kamehameha Schools on the "Condition Assessment for Archaeological Resources in Anahulu Valley Kawaihoa Ahupua'a, Waialua District, O'ahu Island, Hawai'i." The conditions assessment form that was developed for that study was modified for this project for the potential site restoration of agricultural sites. The categories, criteria and values of evaluation are described below. Site condition assessments were done for both sites selected in this study and also for archaeological features within each of the sites. The Table X. in the Appendix summarizes the results of the condition assessment for each feature. The following are the categories and definitions used for the site condition assessment in this study.

- Context Integrity: This category was a subjective one in that it allowed the evaluator to discern the inherent preservation value by looking at the natural and cultural features of this site relative to the other sites in the area. There were 5 categories for this qualitative measurement: low, low to medium, medium, medium to high, and high. Within the site condition assessment, we wanted to include a variable that showed the site's preservation value in terms of overall formal design, execution, and setting on the landscape.
- Site Condition and Functional Value: The overall physical state of preservation was assessed, meaning we rated the "intact-ness" or the ability of the site to fulfill its function as a whole (as an agricultural area), and also its current state. There were 7 categories: poor, poor to fair, fair, fair to good, good, good to excellent, and excellent. We made reference to specific portions of the site whenever possible, describing intra-site conditions and variability.
- Threats to Site Stability/Integrity: Other than the general passage of time, and the forces of gravity, weathering and decay, the main threats to site stability/integrity in regards to restoration planning that were identified were: (a) Flooding and stream bank erosion (assessing low-lying portions of sites, especially the irrigated site complexes (lo'i), where retaining walls or banks are adjacent to a stream experience destruction, partial destruction, or burial. The upstream ends of lo'i are generally in poorer condition than the downstream ends);(b) Natural rock fall (assessing steep slopes adjacent to sites, particularly in the dryland agricultural features and some habitation sites, shrines and burials/possible burials located at or near the toe of slope; some sites have heavily-built walls running along and parallel to the tow of slope, which were built by the original inhabitants to protect themselves from rock fall); (c) Soil erosion and deposition (assessing soil from adjacent slopes is eroded and deposited onto features, which causes total or partial burial of feature by colluvial soil erosion); (d) Established hiking trails (evidenced sporadically throughout and near many of the large site complexes, especially the lo'i. People generally stay on the established trails and this kind of damage is usually very localized. Such sites proposed for reconstruction, rehabilitation, or use could allow for keeping established trails in place to confine such damage); (e) Falling trees and limbs (assessing potential damage to sites in regards to fallen branches or trees onto site features and root systems growing through site features); (d) Bioturbations (primarily refers to the uprooting caused by pigs, which alters the site by aeration and making the ground surface lumpy);
- Health and Safety Concerns: This observation category addresses any hazards presented to human health. Common hazards observed included tree fall, barbed wire, and slip/trip/fall hazards.

- Pedestrian Access: This category identifies means of accessing the features without a vehicle. These are primarily hiking trails.
- Hiking Time: The time (in minutes) to access each site was recorded on each visit to the sites. The average of these times (per site) is recorded in this observation category.

## Fieldwork Process

The fieldwork component encountered a number of initial challenges of working in a relatively remote area. The first step was to clear the vegetation at WAI-2 and WAI-4W so that features at these sites could be better seen and was a necessary step before mapping and the site conditions assessment. Hand tools were used for clearing and no machinery was used to ensure maximum safety and minimal impact to any archaeological features. These initial orientation also helped the students to better understand the scale of the project area and to become more familiar with the site as a whole as well as its individual features. After clearing WAI-2 and WAI-4W of vegetation, the two sites were mapped using the tape-and-compass method. At WAI-2, there were 6 features that we focused on remapping, which included features S,T,U,V,W, and X. WAI-4W also had 6 features and were labeled as Y, AA, AB, AC, AD, and AE. These sites of agricultural barrage terraces had previously been mapped by HARP (Graves et al in 2012) and we found it useful to bring these original maps into the field for reference. In addition to mapping WAI-2 and WAI-4W, detailed feature descriptions were incorporated that documented the state of each portion of the site. Other types of information were recorded as well, such as the surrounding vegetation, surface artifacts, gps points. Also photographs were taken to create a photo log of examples of physical conditions, potential human hazards, vegetation, and context integrity.

All draft field maps from both sites were scanned and uploaded for digitization. They were uploaded onto iPads for illustration and tracing into finalized professional site maps to be used for the report. In addition, each feature and its components on the site map were illustrated by color based on its current condition, which was divided into 5 categories:

- **Green** was used to represent features that are in “excellent” to “good” condition, meaning that the feature is intact with no need for reconstruction and faces little to no threats. These features are ready for functional use without any remediation necessary.
- **Yellow** designated features recognized as being in “good” to “fair” condition, remaining intact with some necessary reconstruction in order to restore the feature to full functional condition and/or aesthetic value.
- **Orange** represented features that were in “fair” to “medium” condition, obviously not fully intact and requiring reconstruction.
- **Red** was used for features that were in “medium” to “poor” condition, in dire disrepair, or even completely washed out. These require heavy reconstruction to be returned to fully functional use and/or aesthetic value.



## Wai‘āpuka Agricultural Site Descriptions

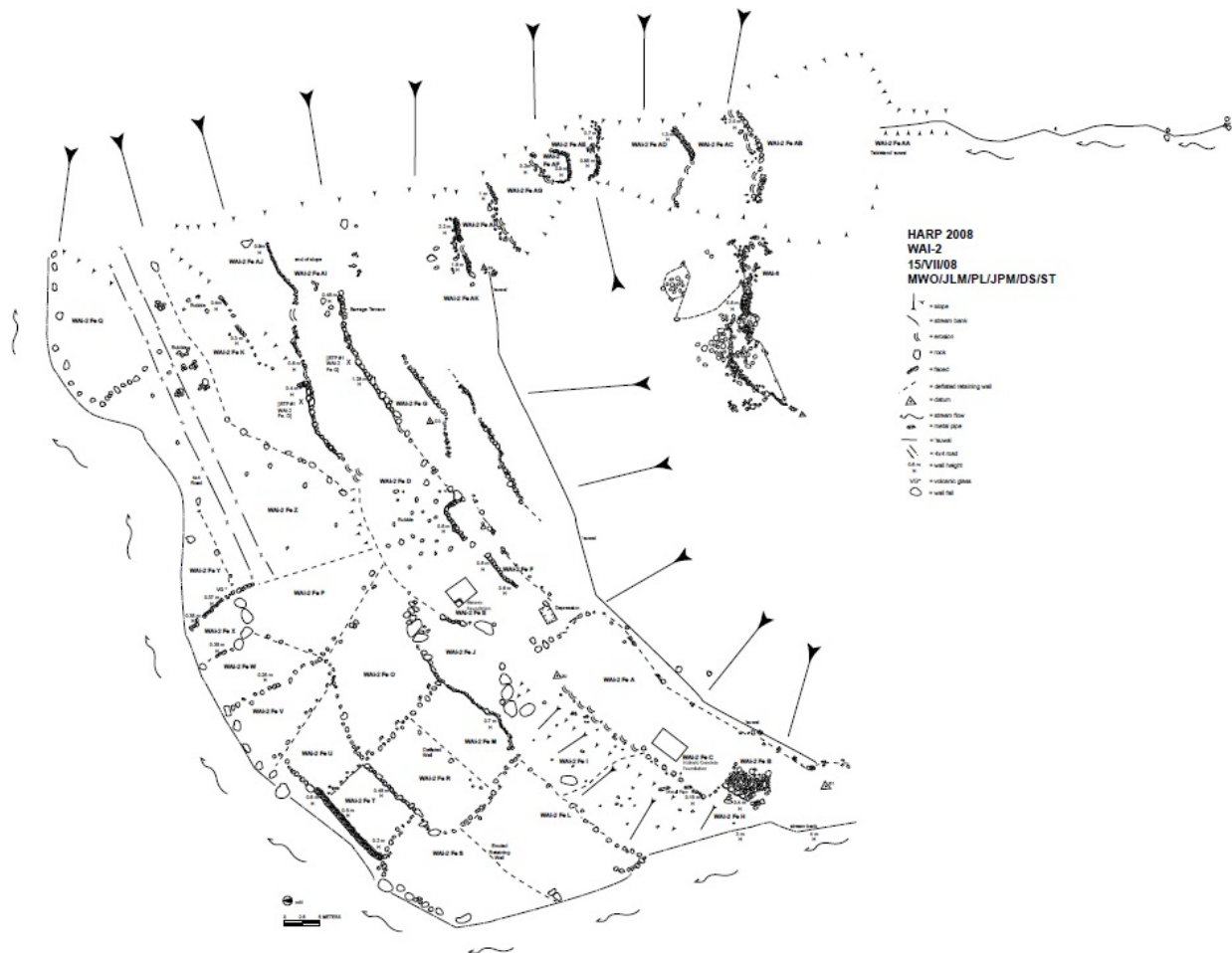


Figure 2. 2008 HARP report map of WAI-2 (McCoy and Graves 2008:66).

### WAI 2 Site Description:

Site WAI 2 in the ahupua‘a of Wai‘āpuka, Kohala, exists within a stream bottomland topographical setting. It includes 37 features stretching from Waikama gulch, up its eastern slope and out to the tableland immediately above (McCoy and Graves 2008:34). Within WAI 2, this description focuses on only six specific features named S, T, U, V, W, and X (McCoy and Graves 2008:66); a series of six abutting terraces, ranging in elevation from 207 meters above sea level (MASL) at its lowest point in Feature X, to 209 MASL in Feature S. The terraces are agricultural in function and are situated adjacent to Waikama Stream along its eastern bank. Overall site condition is rated as “fairly good,” midway between “good” and “fair” possessing a balance of mostly intact retaining walls and retaining walls that are in poor condition. The site contains irrigation and agricultural features, referred to traditionally as lo‘i, and contains one ‘auwai, or irrigated ditch. Water is sourced from Waikama stream, a perennial stream adjacent to the site and is diverted via a dam comprised of concrete and stone located south of feature WAI-2S. The site is dense with vegetation, consisting primarily of christmas berry (*Schinus terebinthifolius*). Niu (coconut; *Cocos nucifera*), ginger (*Zingiber spp.*), guava (*Psidium*

*guajava*), and kukui (candlenut; *Aleurites moluccana*) comprise the remainder of the dominant vegetation in the area. Of the above mentioned vegetation, the niu and kukui may perhaps be considered to be cultivated/managed vegetation. One kalo (taro; *Colocasia esculenta*) plant was also found within feature WAI-2S (see Appendix D, Figure 1.), perhaps providing supporting evidence of the use of these terraces in kalo cultivation. Surface artifacts are present in the area and include historic glass bottles, basalt flakes and volcanic glass flakes.

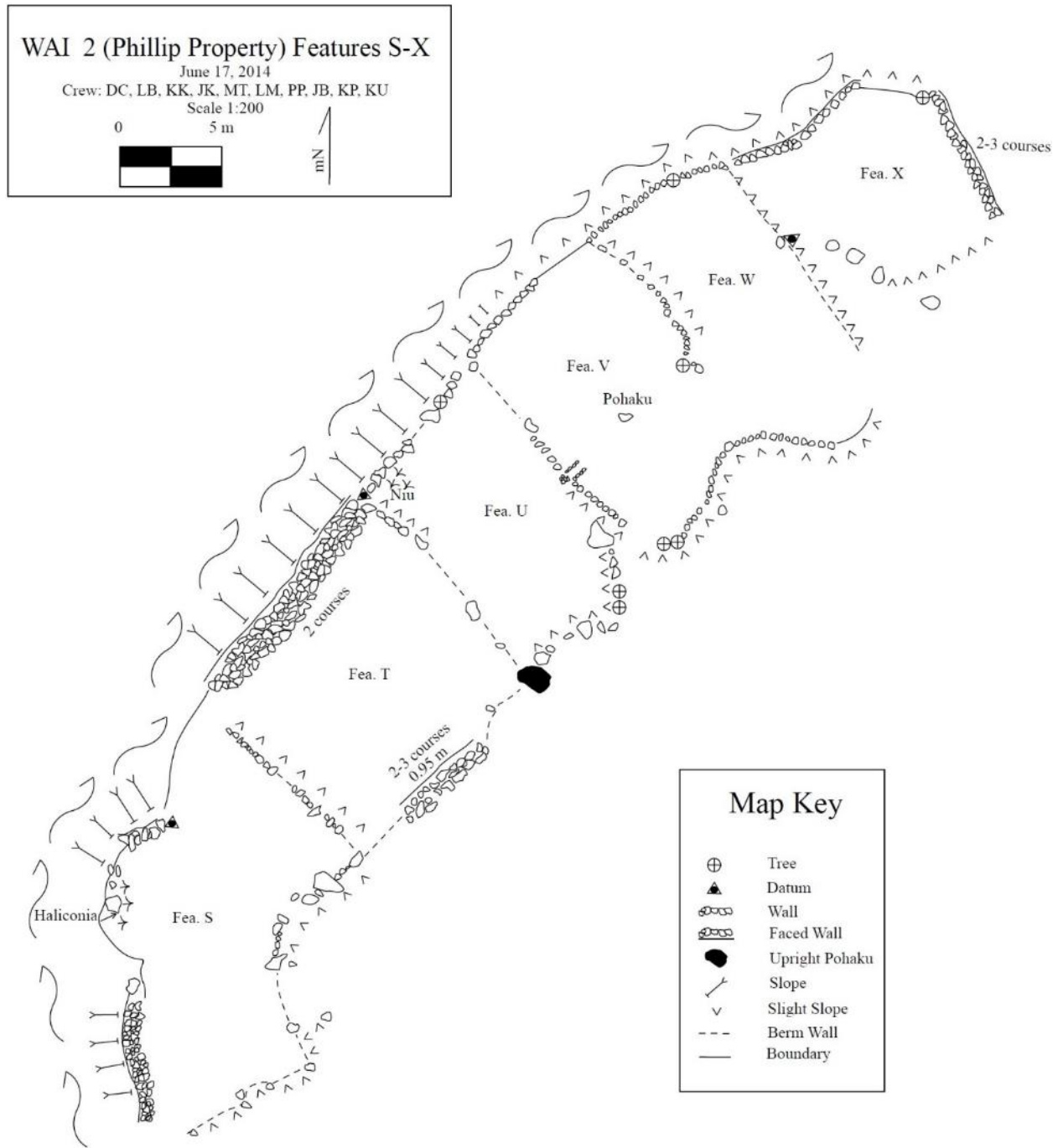


Figure 3. Map of WAI-2 Features S-X as mapped by Ka'alewaihili.

## Features:

### *Site WAI-2, Feature S*

Feature S is the first of six abutting terraces heading north along Waikama Stream within the project area. The terrace is irrigated via an 'auwai which originates at Waikama Stream to the south of Feature S. Historic alterations include a five-course, faced, stone retaining wall approximately 0.89 to 1.3 m in height and 5.75m in length situated along the western boundary of the Feature. The wall incorporates natural boulders and is in good condition. The wall is currently overgrown with Ginger but is in good to excellent condition. The western face of the wall can be viewed from the stream bed while facing East. This wall was not previously mapped in the 2008 McCoy and Graves HARP report. The eastern berm of Feature S is approximately 0.72m in height and 11.25m in length (see Appendix D, Figure 2.). The south wall of Feature S is approximately 0.55m in height and 6.75m in length. Currently a large tree and its associated root system occupies the center of the terrace. Feature S is situated fairly close to the po'owai (dam) (see Appendix D, Figure 3) just south of the feature and is in excellent position for receiving fresh water from the adjacent Waikama Stream.

### *Site WAI-2, Feature T*

Feature T is the second terrace, and like Feature S, is also irrigated pending irrigation of the adjacent features S and R. Historic alterations within the terrace include faced, stone retaining walls along the borders of the feature. The walls incorporate natural boulders. The south-east wall is two to three courses, approximately 0.95m in height and 5.25m in length and in fair condition (see Appendix D, Figure 4). The north-west wall is also two-three courses and is approximately 0.61m in height, 11.25m in length and in good condition (see Appendix D, Figure 5). The south-west berm is in poor condition, and measures approximately 0.44m in height, and 9.25m in length. Currently it is washed out and unable to retain soil effectively. The north-west face of the north-west wall is visible from the stream bank when facing East. The south-west face of the south-east wall and the north-east face of the south-west wall are visible from within the terrace. A kukui (candlenut) tree is situated at the center of the feature.

### *Site WAI-2, Feature U*

Feature U is the third terrace of six. Feature U is also irrigated pending irrigation of adjacent features T and O. Historic alterations include faced, stone retaining walls along the borders of the terrace. The south-east wall is in fair condition and approximately 0.80m in height and 9m in length. The south-west berm is in fair condition and measures approximately 0.39m in height, 12m in length. The northwest bank is in good condition and measures approximately 0.90m in height, 8.5m in length. The northeast berm (see Appendix D, Figure 6) of the terrace is in poor to fair condition and is visible from within feature V facing Southwest. The faces of the south wall and the east wall are visible from within the terrace. A niu (coconut tree) is located just outside of the west wall near Waikama Stream. A kukui tree is situated within the center of the terrace. A historic bottle was found within the terrace near the west wall, dated circa 1942.

#### *Site WAI-2, Feature V*

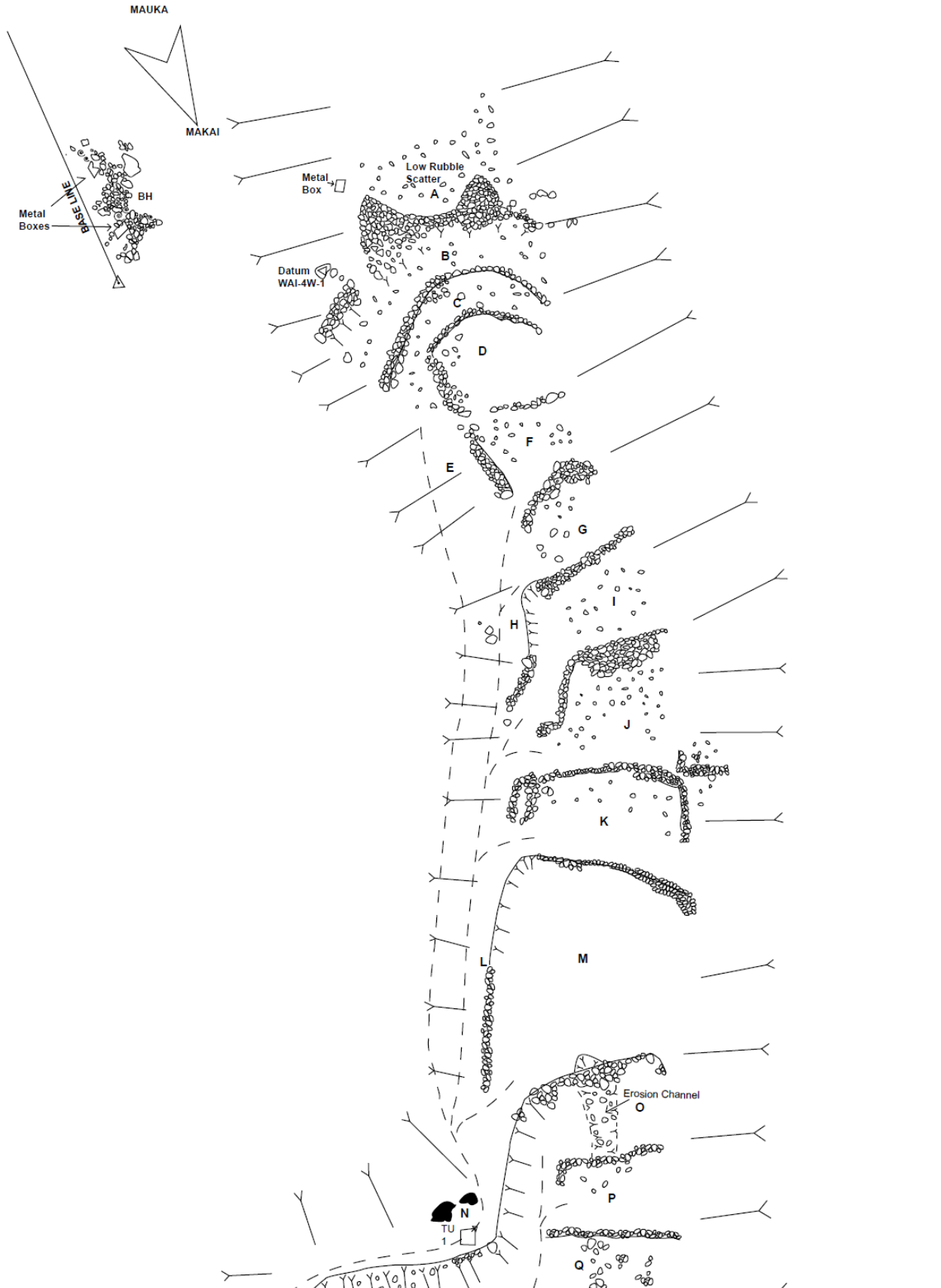
Feature V is the fourth of six terraces and is irrigated pending irrigation of Features U and O. Historic alterations include faced, stone retaining walls along borders of the terrace that incorporate natural boulders. The south-east wall is 2-3 courses measuring approximately 1.05m in height and 7.5m in length and is in poor condition from the center portion extending to the northern border (see Appendix D, Figure 7.), and fair to good condition from the center of the wall extending to the south-west berm. The south-west berm is approximately 0.25m in height and 13.25m in length, and is in poor condition from its center until the north-west wall, and is in fair condition from its center until the south-east wall. The north-west wall is approximately 5m in length and is in poor condition. The face of the north-west wall is visible from the stream bank when facing East. The faces of the south-east wall and the south-west berm are visible from within the terrace. A pipe found within the feature measures approximately 0.69m in length.

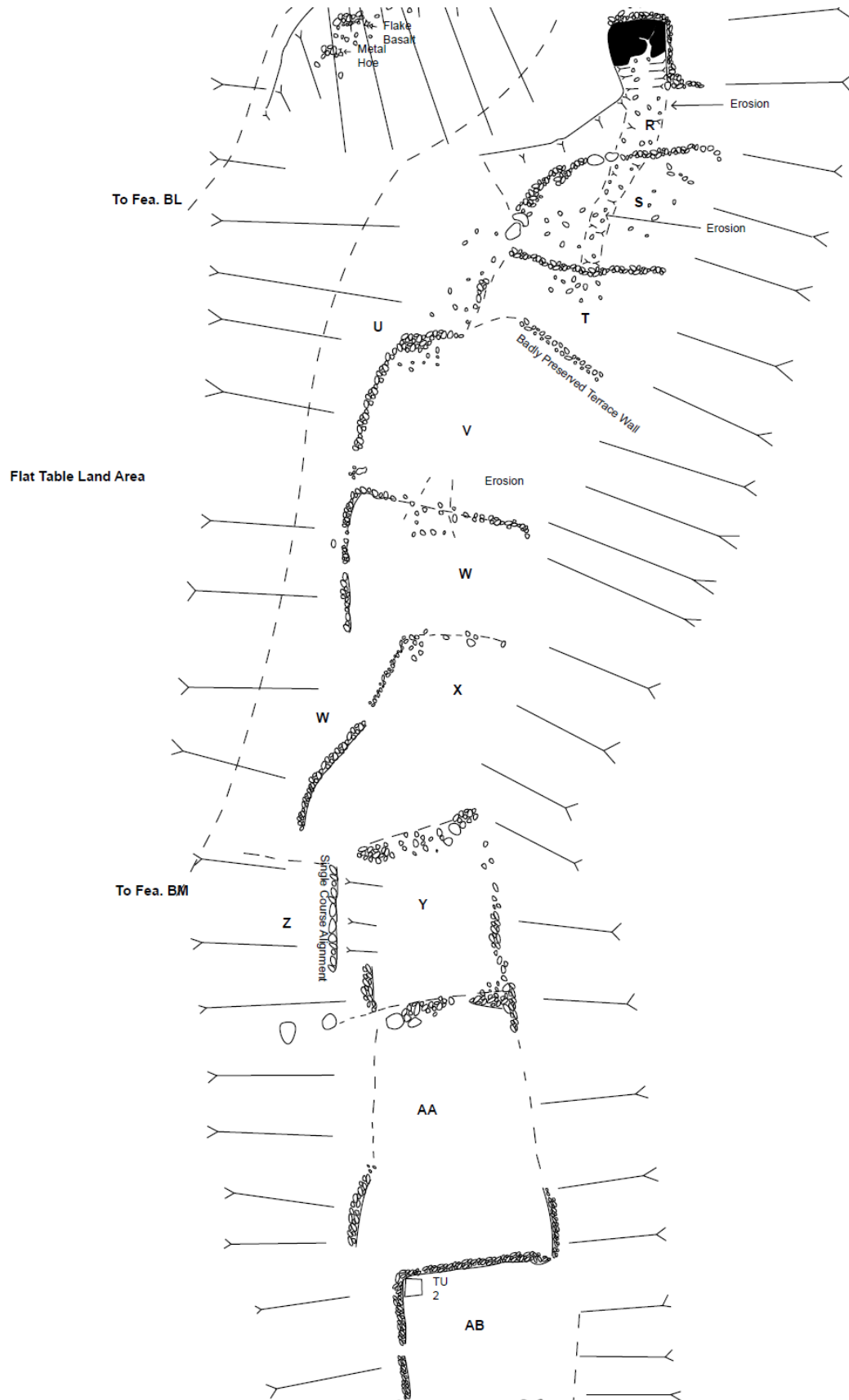
#### *Site WAI-2, Feature W*

Feature W is the fifth of six terraces. The terrace is irrigated pending irrigation from adjacent Features V and P. Historic alterations within the feature include faced, stone retaining walls along borders of the terrace incorporating natural boulders. The south wall is approximately 5m in length and in poor condition due to erosion (see Appendix D, Figure 8). The west wall is approximately 0.60m in height, 7.5m in length and is in poor condition from the kukui tree growing near its eastern edge until the south wall, good condition from the same kukui tree until the center portion of the wall heading North, and fair condition from the center of the wall until the north wall. The north wall is approximately 0.65m in height and 7.5m in length and is in good condition with niho stone (foundational stone) still intact. A large kukui tree is growing in part of the south wall.

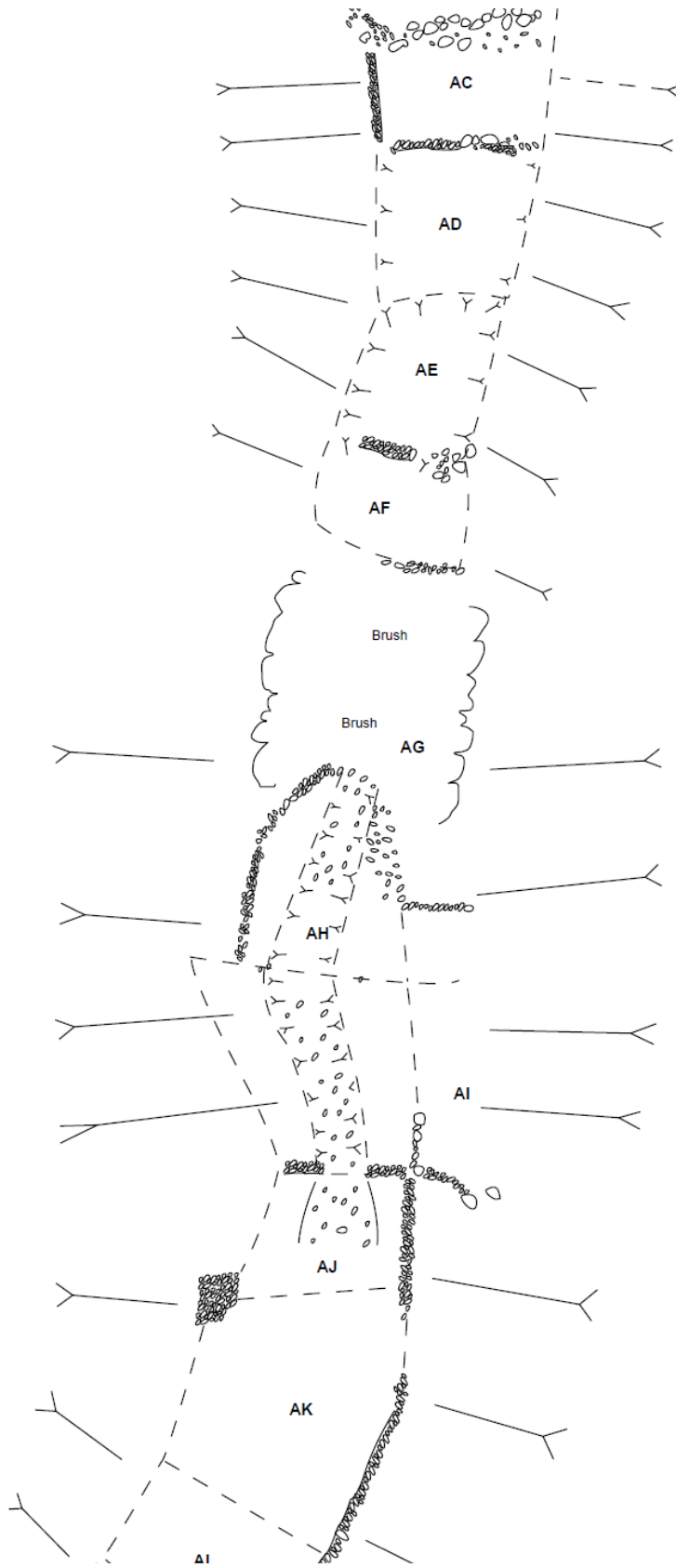
#### *Site WAI-2, Feature X*

Feature X is the sixth of six terraces. The terrace is irrigated pending irrigation from adjacent features W and P. Historic alterations in the feature include faced, stone retaining walls along borders of the terrace incorporating natural boulders. The east wall is 2-3 courses and approximately 0.42m in height and 6.75m in length (see Appendix D, Figure 9). It is in good condition. The north wall is approximately 0.75m-0.76m in height and 6.75m in length. It was not mapped in the McCoy and Graves report (2008). The wall is in fair condition. The west wall is approximately 0.3m in height and 11.75m in length and is in poor condition from its center until the north wall, and in fair condition from its center until the south border. The eastern wall is in good condition, and its face may be viewed when standing East of the feature and facing west. Large boulders mark the southern boundary (see Appendix D, Figure 10). The face of the north wall may be seen from the stream bank when facing South. There is a niu tree at the northern corner of the feature. Two kukui trees are situated along the west wall. A large kukui tree is situated just outside of the boulders on the southern boundary of the feature.









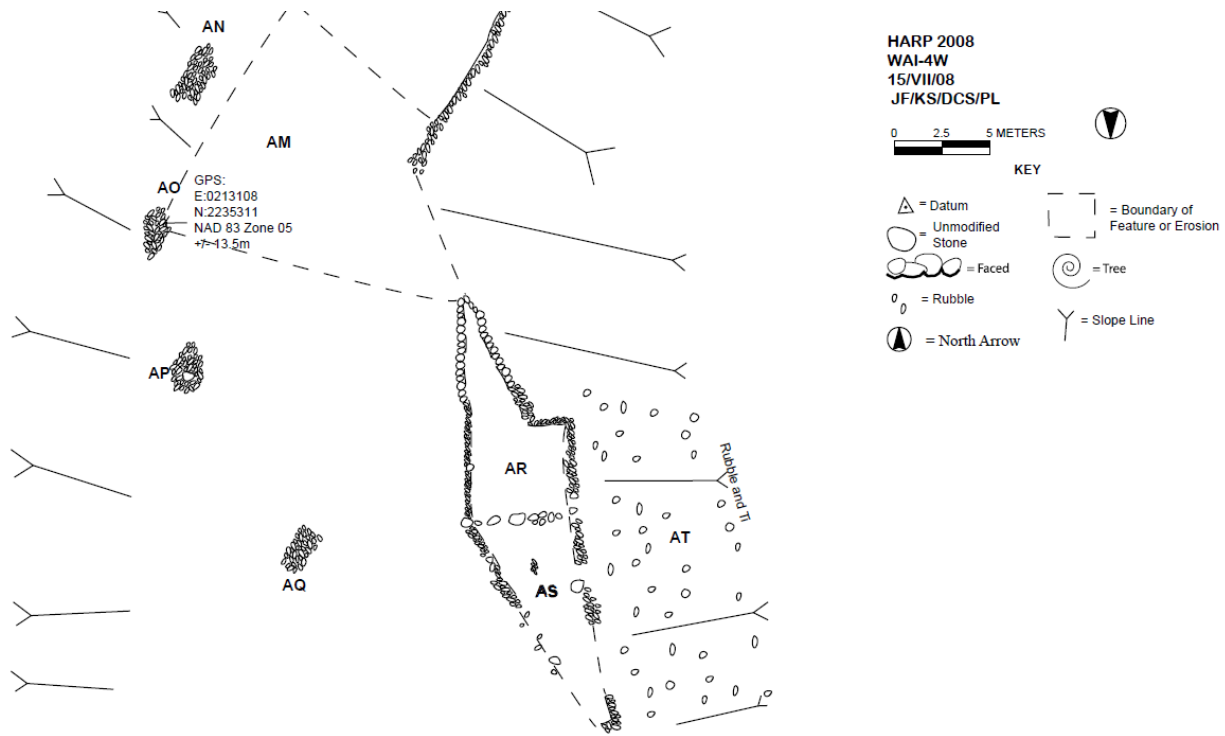


Figure 4. 2008 HARP map of WAI-4W (McCoy and Graves 2008:39-44).

## WAI-4W Site Description:

### General Site Description:

Site WAI-4W in the ahupua‘a of Wai‘āpuka, Kohala, exists within a dry gully topographical setting. It is one of the best, and largest preserved examples of a barrage terrace complex containing 65 features including 52 barrage-style terraces (Kirch 1977:260-261), many of which are built across drainage bottoms and have multiple side retaining walls (Graves et al 2010-2011:40). Within WAI-4W, this description focuses on only 6 features, abutting barrage terraces towards the inland portion of WAI-4W: WAI-4W-Y, WAI-4W-AA, WAI-4W-AB, WAI-4W-AC, WAI-4W-AD, and WAI-4W-AE (McCoy and Graves 2008:39-44); as well as two abutting features at the most seaward portion of WAI-4W: WAI-4W-AS, and WAI-4W-AR. WAI-4W ranges in elevation from its lowest point at 285 MASL, with the highest point of WAI-4W as examined within the scope of this project at 340 MASL. The terraces are agricultural in function, perhaps irrigated by a perennial stream and potentially containing one ‘auwai. The terraces may have been irrigated by ‘Ōpaepilau, however this has not yet been verified. The site contains moderate vegetation consisting primarily of Christmas Berry and Guava, with ferns comprising the remainder of the notable vegetation. Excavation has been previously conducted in feature AB, test unit 2 where charcoal was found. Surface artifacts present in the area include historic bottles, a metal box, flake basalt, and lithic groundstone. Radiocarbon dates for the area predate 1810.

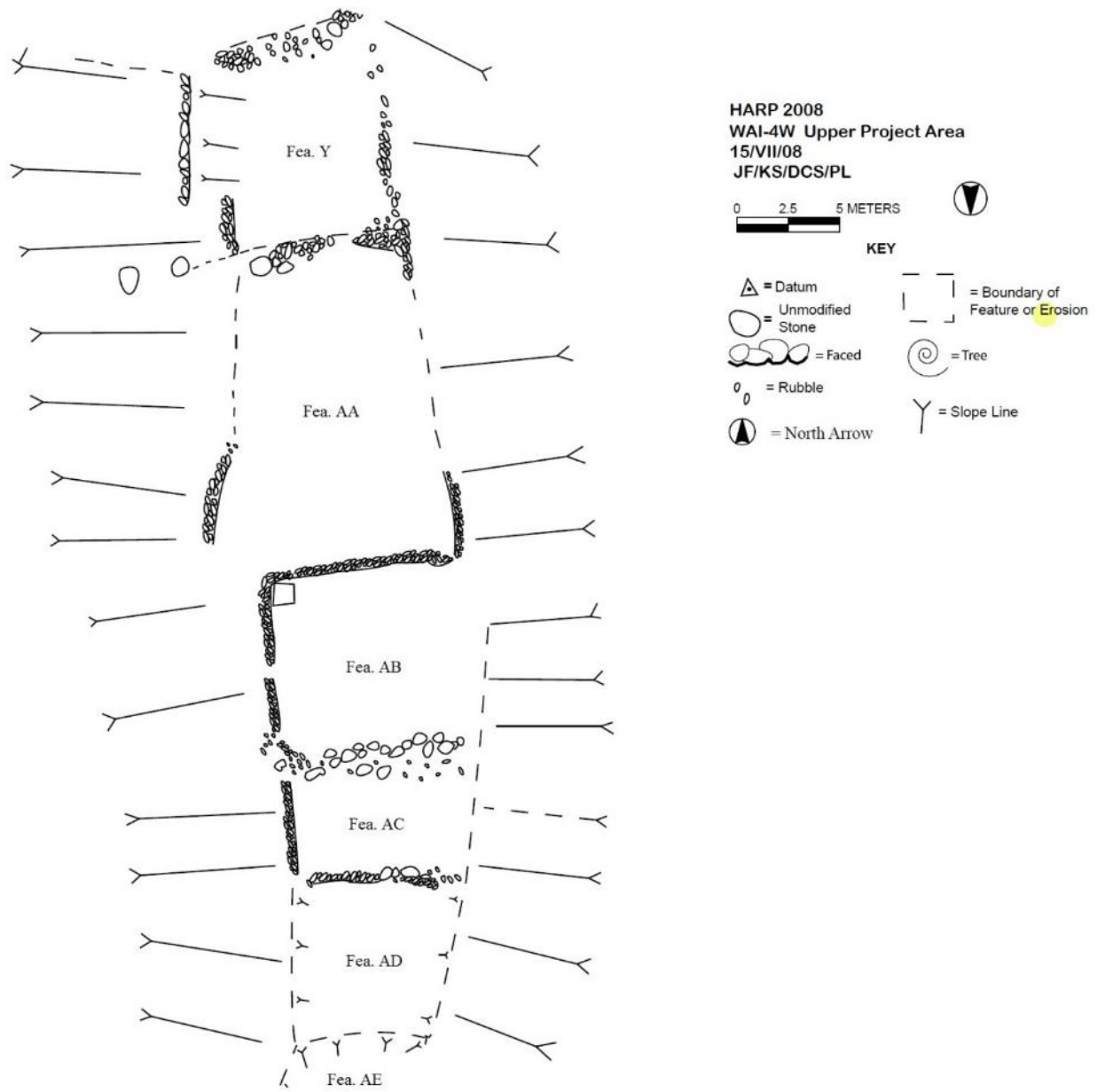


Figure 5. Map of WAI-4W features Y through AE. (Modified version of map found in McCoy and Graves 2008:41-42).



Figure 6. Map of ma kai features in site WAI-4W. Note: Features AR and AS towards bottom of map. (Modified version of map found in McCoy and Graves 2008:44).

## Features:

### Site WAI-4W, Feature Y

Feature Y is the first of six abutting terraces in the inland portion of Site WAI-4W examined by this report. It is generally square in shape with its southern boundary measuring approximately 9.4m in length, western boundary approximately 10m in length, northern boundary approximately 8.3m in length, and its eastern boundary approximately 9m in length. McCoy and Graves 2008 note a single course, faced alignment along the eastern border which measures approximately 5.8m in length as estimated from their map (McCoy and Graves 2008:41-42). Historical alterations include retaining walls along the southern, eastern, and western borders. The southern wall is about four to five courses at its highest point (see Appendix D, Figure 11) measuring approximately 1 m in height and 8.2 m in length. It is in good condition. The eastern wall is in fair condition, with portions of it in good condition, and is approximately four to five courses at approximately 0.57 m in height (see Appendix D, Figure 12). The western wall is in

fair to good condition and is roughly 3 courses standing approximately 0.56 m in height (see Appendix D, Figure 13). Its northern wall also serves as the southern wall for Feature AA.

#### *Site WAI-4W, Feature AA*

Feature AA is the second terrace, and is generally rectangular in shape. Its southern boundary measures approximately 8.2 m in length, its western boundary approximately 14.4 m in length, northern boundary approximately 11.6m in length, and its eastern boundary approximately 14 m in length. Historic alterations include portions of retaining walls along the eastern and western boundary of the feature, as well as a retaining wall along the northern border. The eastern retaining wall, from its center extending towards the North, is in excellent condition and measures approximately 0.73 m in height. It is in poor condition from its center extending toward the South, likely due to erosion. The western retaining wall from its center extending towards the North is in excellent condition and measures approximately 0.46 m in height. It is in poor condition from its center extending toward the South. The northern wall is approximately 0.90 m in height and 10.4 m in length. Portions of the South wall are in excellent condition (see Appendix D, Figure 14).

#### *Site WAI-2, Feature AB*

Feature AB is the third terrace and is also generally rectangular in shape. Its boundaries are approximately 10.4 m in length at its southern border, 14.4 m along its western border, 11.6 m along its northern border, and 14 m along its eastern border. Its western border is a slope of a gully with possible rock fall washed out from a previous wall. Its eastern wall is in excellent condition approximately 0.35 m in height. Its northern wall is in excellent condition and is approximately 1.05 m in height and 11.3 m in length (see Appendix D, Figure 15). Test Unit 2 from a previous excavation lies in the south-east corner of Feature AB.

#### *Site WAI-4W, Feature AC*

Feature AC, the fourth terrace is also generally rectangular in shape with its boundaries measuring approximately 9.4m in length along its southern boundary, 6 m in length along its western boundary, 8.4 in length along its northern boundary, and 5.2 m along its eastern boundary. Historical alterations include stone retaining walls along some of its borders. Its eastern wall is about three to four courses and stands approximately 0.40 m in height (see Appendix D, Figure 16). It is in poor condition, possibly washed out from a flood. Its south retaining wall is in good condition, and stands approximately 0.96 m in height. Its north wall is in good condition, and measures approximately 0.55 m in height and 6.8 m in length. Its western wall is also in good condition. Cattle bones were found within the terrace (see AppendixD, Figure 25).

#### *Site WAI-4W, Feature AD*

Feature AD, the fifth terrace is generally square in shape, and its boundaries measure approximately 8.4 m in length along its southern border, 6m in length along its western border, 6.4m in length along its northern border, and 7 m in length along its eastern border. The

northern wall is blown out and in poor condition with approximately 0.55 m change in height from Feature AE to Feature AD. The eastern wall and the western wall are potentially blown out. The South retaining wall (which is also the North retaining wall for feature AC) is in good condition (see Appendix D, Figure 17.). A guava tree grows in the center of the terrace. Cattle bones were found within the terrace. A pōhaku (rock), possibly intentionally shaped was also found within Feature AD.

#### *Site WAI-4W, Feature AE*

The sixth terrace, Feature AE is roughly triangular in shape, and its boundaries measure approximately 6.4 m along its southern border, 7.8 m along its western border, 6.8 m along its northern border, and 6.2 m along its eastern border. The southern wall, which is shared with feature AD is blown out.

#### *Site WAI-4W, Feature AR*

One of two abutting features in the seaward portion of WAI-4W examined in this report, Feature AR is rectangular in shape at its northern end, and is shaped triangularly at its southern end. It is approximately 6.8 m in length along its south-western boundary, 2.2 m in length along the center-western portion of its boundary, 4.4 m in length along its western boundary, 5.8 m in length along its northern boundary, and 10.5 m in length along its eastern boundary. Historical alterations include stone retaining walls. Its eastern wall is approximately 0.40 m in height and is in fair condition from its center extending towards the North, and in poor condition (blown out) from its center extending towards the South. Its western wall is about 4-5 courses and stands approximately 0.50 to 0.60 m in height and is in excellent condition. Its northern wall is in poor condition. Its south-western wall is blown out and in poor condition. There are potential burials towards the east and south-east of Features AR and AS.

#### *Site WAI-4W, Feature AS*

The second of the seaward features, Feature AS is generally triangular in shape. It measures approximately 5.8 m in length along its southern boundary, 10.8 m in length along its western boundary and 12.2 m in length along its north-eastern boundary. Historical alterations include stone retaining walls along its borders. Its southern wall is approximately 0.30 m in height and in poor condition. Its western wall is approximately 1 m in height and in excellent condition. Its north-eastern wall is approximately 0.40 m in height and is in fair condition from around its center extending towards the North, and in fair to good condition from around its center extending towards the South.

Condition Assessment of Sites WAI-2 and WAI-4W

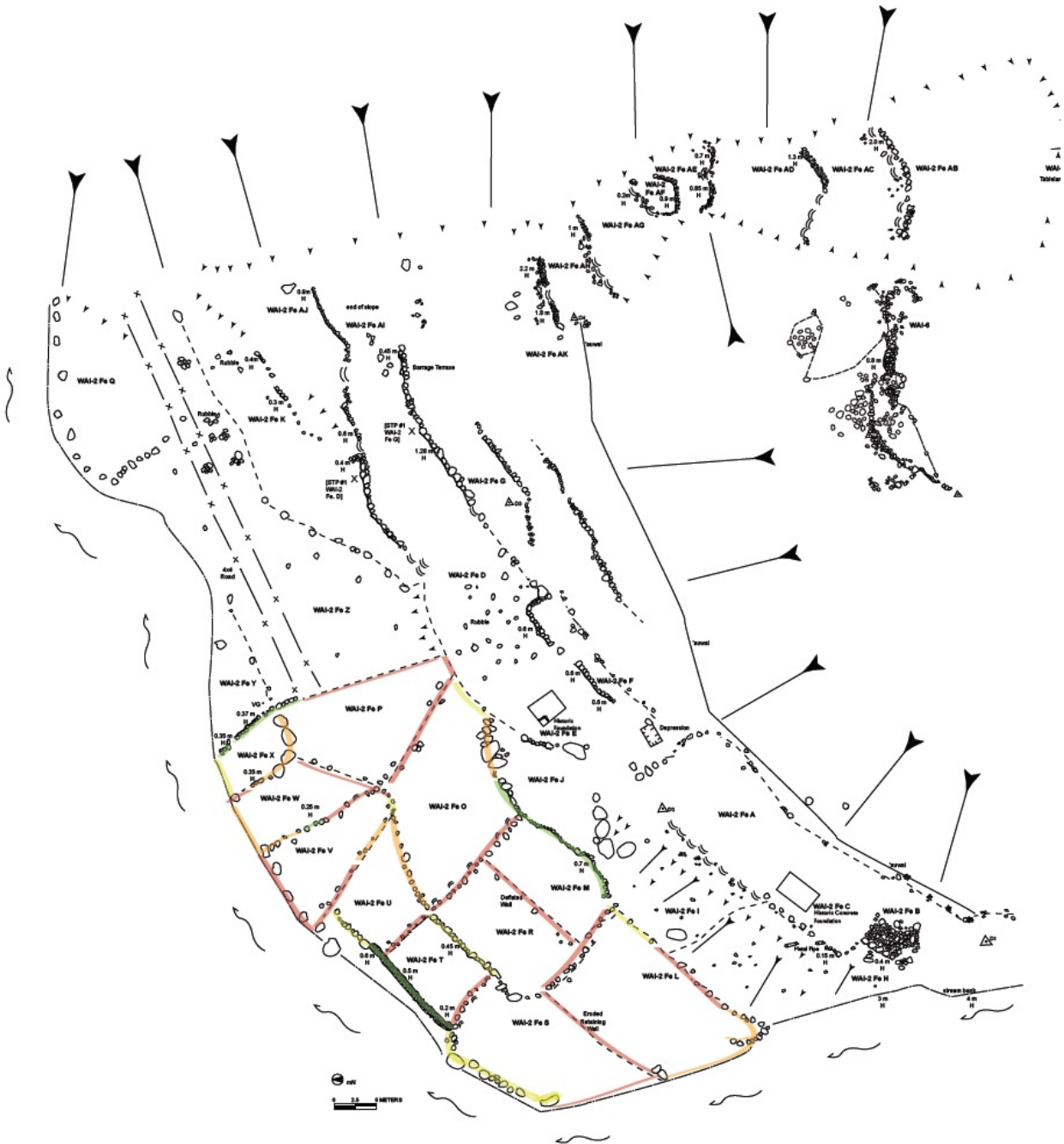


Figure 7. Condition Assessment map for WAI-2. Original map from HARP 2008 report (Mcoy and Graves 2008:66).



**Table 3. Assessment of Individual features within Site WAI-2.**

Site Data*	Context Integrity	Site Condition and Functional Value	Site-specific Threats to Stability/ Integrity	Site-specific Health & Safety Concerns	Pedestrian Access	Hiking Time
WAI-2-S Lo'i Terrace	<b>5 – High.</b> Obvious retaining walls present in this site and in surrounding terraces. Presence of kalo plant is a strong indicator of taro cultivation. Close proximity to physically intact potential po'owai (referred to as “possible ‘auwai one” in photo log).	<b>5 – Good.</b> West wall in excellent condition. Slope Elevation conducive to adequate water flow to abutting terraces in Northward progression. Great access to water. Vegetation overgrowth and large tree and root systems in center of terrace and East Berm is problematic.	1.Vegetation overgrowth 2.Large tree & root system in center of terrace 3.Tree and root system on East Berm 4. Potential tree fall 5.Stream erosion on Southwest corner – takes brunt of stream flow	1.Potential tree fall	Hiking trail	4:35 min.
WAI-2-T Lo'i Terrace	<b>5- High.</b> Surrounding terraces and retaining walls suggest a system of lo'i terraces. Close proximity to water as fed through adjacent terraces.	<b>5 – Good.</b> West and East retaining walls in good condition. Good access to water pending adjacent terraces. South berm in poor condition. Kukui tree and root system in center of lo'i. Vegetation overgrowth from christmas berry threatens East and West walls.	1.Vegetation overgrowth (roots) on West and East walls 2.Kukui tree and root system in center of lo'i.	1. Potential tree fall	Hiking trail	4:35 min.
WAI-2-U Lo'i Terrace	<b>5 – High.</b> Surrounding terraces and retaining walls suggest a system of lo'i terraces. Close proximity to water and adjacent house site.	<b>4 – Fair to Good.</b> Retaining walls in poor to fair condition. Good access to water pending adjacent terraces.	1.Kukui tree and root system in center of lo'i.	1. Potential tree fall (coconut)	Hiking trail	4:35 min.
WAI-2-V Lo'i Terrace	<b>5 – High.</b> Surrounding terraces and retaining walls suggest a system of lo'i terraces. Close proximity to water and adjacent house site.	<b>3 – Fair.</b> Retaining walls primarily in poor condition with some in fair condition. Good access to water pending adjacent terraces.	1.Pedestrian access way running through Southeast slope	1.Potential Tree fall	Hiking trail	4:35 min.
WAI-2-W Lo'i Terrace	<b>5 – High.</b> Surrounding terraces and retaining walls suggest a system of lo'i terraces. Manowai in close proximity.	<b>3 – Fair.</b> Retaining walls in primarily poor condition. Kukui tree and root system growing in Southwestern wall. Good access to water pending adjacent terraces.	1.Large kukui tree and root system in Southwest wall	1. Barbed wire growing out of tree 2.Potential tree fall (nearby coconut)	Hiking trail	4:35 min.

WAI-2-X Lo'i Terrace	<b>5 – High.</b> Surrounding terraces and retaining walls suggest a system of lo'i terraces. Manowai in close proximity. Close proximity to water.	<b>4 - Fair to good.</b> Retaining walls in primarily fair to good condition. Good access to water pending adjacent terraces. Kukui trees and root systems growing in Southwestern wall	1.Kukui tree and root system growing in Southwestern wall.	1.Potential tree fall (nearby coconut tree) 2.Barbed wire on stream bank wall.	Hiking trail	4:35 min.
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**Table 4. Overall Assessment of Site WAI-2.**

Site Data*	Context Integrity	Site Condition and Functional Value	Site-specific Threats to Stability/ Integrity	Site-specific Health & Safety Concerns	Pedestrian Access	Hiking Time
WAI-2 Agricultural Complex	<b>5 – High.</b> Surrounding terraces and retaining walls suggest a system of lo'i terraces. Close proximity and access to water via nearby potential po'owai. Area is very conducive to the growth of native and Polynesian-introduced plant species. Presence of kalo perhaps provides evidence of function of area in kalo cultivation. Firsthand account of a kupuna who lived on the site validates the function of site WAI-2 in kalo cultivation.	<b>4 – Fair to Good.</b> Variation in current functionality of retaining walls from poor to good or even excellent. Good access to water. Area is very conducive to the growth of native and Polynesian-introduced plant species. Vegetation growth and root systems in retaining walls and center of lo'i threaten integrity.	1.Vegetation overgrowth 2.Large trees and root systems in centers of terraces and growing in retaining walls 3.Evidence of cattle in nearby terraces is proof of potential threats of bioturbation 4.Flooding.	1. Potential tree fall (limbs, branches, coconuts) 2.Barbed wire in some areas	Hiking trail	4:35 min.

**Table 5. WAI-2 access points and logistics.**

Access	4 – Wheel drive from county Road	Hiking Time from accessible roadway	Pros and Cons of this Access Route	Comments
Hiking trail	3:45 min. along private access road on 'Akonipule Hwy.	4:35 min	1. Easily accessible with 4x4 vehicle. 2. Short hiking trail is easy to moderate difficulty	

## WAI-2 Condition

### *Context Integrity*

The features of WAI-2 examined within this report, namely features S, T, U, V, W, and X (McCoy and Graves 2008:66) are all part of a series of abutting terraces adjacent to Waikama Stream. These terraces are surrounded by at least five other terraces comprising 11 out of 37 features identified within feature WAI-2 and are located within close proximity to the stream providing excellent context for the function of these terraces in kalo cultivation as well as the cultivation of other native and Polynesian-introduced plants. The retaining walls of these terraces are easily visible. Such context is strengthened by the presence of kalo (see Appendix D, Figure 1) growing near the western wall of feature WAI-2-S, as well as the nearby po'owai (dam) (see Appendix D, Figure 3) located towards the south of Feature S which may effectively divert water from Waikama Stream. Another similar dam is located in Waikama Stream adjacent to Feature WAI-2-W. A former house site is situated within the site, towards the East of the six features examined. First hand account given by a kupuna who stayed in this house during weekends of his childhood with the family who lived there validates the function of site WAI-2 in kalo cultivation. Overall Site WAI-2 has high context integrity as a system of irrigated and terraced lo'i, earning a rating of five on a scale of one to five.

### *Site Condition and Functional Value*

In general, the various retaining walls within the features of site WAI-2 are easily recognizable, however the physical integrity and the ability for each wall to serve its intended function varies in condition from excellent (see Appendix D, Figure 18) to poor, or even washed out (see Appendix D, Figure 8). The site has excellent potential for access to water for irrigating the terraces, and the potential po'owai (see Appendix D, Figure 3) south of Feature WAI-2-S is in excellent condition for diverting water to these features should the 'auwai be opened up. The slope elevation of the abutting terraces is conducive to adequate waterflow in a northward progression throughout said terraces. This northward progression of waterflow is beneficial to irrigated kalo cultivation, but also presents potential threats to the integrity of the North-South facing retaining walls in the events of flooding. This is evidenced in the more frequent poor condition of the retaining walls towards the southern portion of the site in comparison to the retaining walls towards the northern end of the site (see Appendix D, Figure 6), perhaps due to the closer proximity of the southern walls to the potential of source of flooding from Waikama Stream. Kalo that has been found growing in the area provides proof of the site's conduciveness to the growth of native and Polynesian-introduced plant species. Dense vegetation growth encroaches upon many of the retaining walls. Many instances of trees and their associated root systems occur within the center of the terraces where kalo would be planted. Growing trees and root systems also occur within the structure of some of the retaining walls, though they were most likely not an intended integration at the time the walls were constructed. Overall site WAI-2 is has a Fair to Good Site Condition and Functional Value, earning a rating of four on a scale of one to seven.

### *Site Specific Threats to Stability/Integrity*

The prevailing threat to the stability and integrity of site WAI-2 is the presence of dense vegetation overgrowth especially as occurring in and near the retaining walls, as well as the various trees and root systems which occur in the centers of terraces. Damage from the growth of this vegetation (see Appendix D, Figure 19), as well as from the potential uprooting of falling trees may cause considerable damage to the retaining walls of this terraced lo'i system and would prevent it from functioning effectively in kalo production. Stream erosion is most likely to occur at the south-west corner of feature WAI-2-S, however this may not present any imminent danger to the overall stability and integrity of the site excepting heavy flood events which are potentially evidenced by the presence of partially washed out walls within the site (see Appendix D, Figure 20). Soil erosion from the southern terraces are evident within the terraces adjacent to them on their northern borders, perhaps from these flooding events (See Figure 4. June 19 frame 106 fuji Site Description). Human pedestrian trails (see Appendix D, Figure 7) along the eastern borders have contributed to the degradation of these eastern retaining walls. The presence of cow bones is evidence of the potential threat of bioturbation by cattle.

### *Site Specific Health and Safety Concerns*

Site WAI-2 possess many of the inherent dangers of most forested areas, such as uneven footing, potential for slips, trips and falls due to loose rocks and fallen tree limbs, and lack of cell phone reception for making calls to emergency personnel. Insect bites, sun exposure, dehydration, feral pigs, and hazards incurred by tool-use comprise the bulk of general safety concerns for the area, similar to other forested work areas. Within WAI-2, the primary threats to health and safety occur from potential tree fall (see Appendix D, Figure 21); that being falling dead limbs, and even coconuts (see Appendix D, Figure 22) from the dense vegetation within the area. Rusty barbed wire (see Appendix D, Figure 23) from previous use in cattle management and remnants of metal pipes used for irrigation exist within the site and provide potential cutting and infection hazards.

### *Site Accessibility*

Site WAI-2 is accessed via a four minute drive along a private road on 'Akoni Pule Highway. A four-wheel drive vehicle is necessary to traverse this road. Once parked, WAI-2 is reached via a four and a half minute hike of easy to moderate difficulty down a moderate grade.

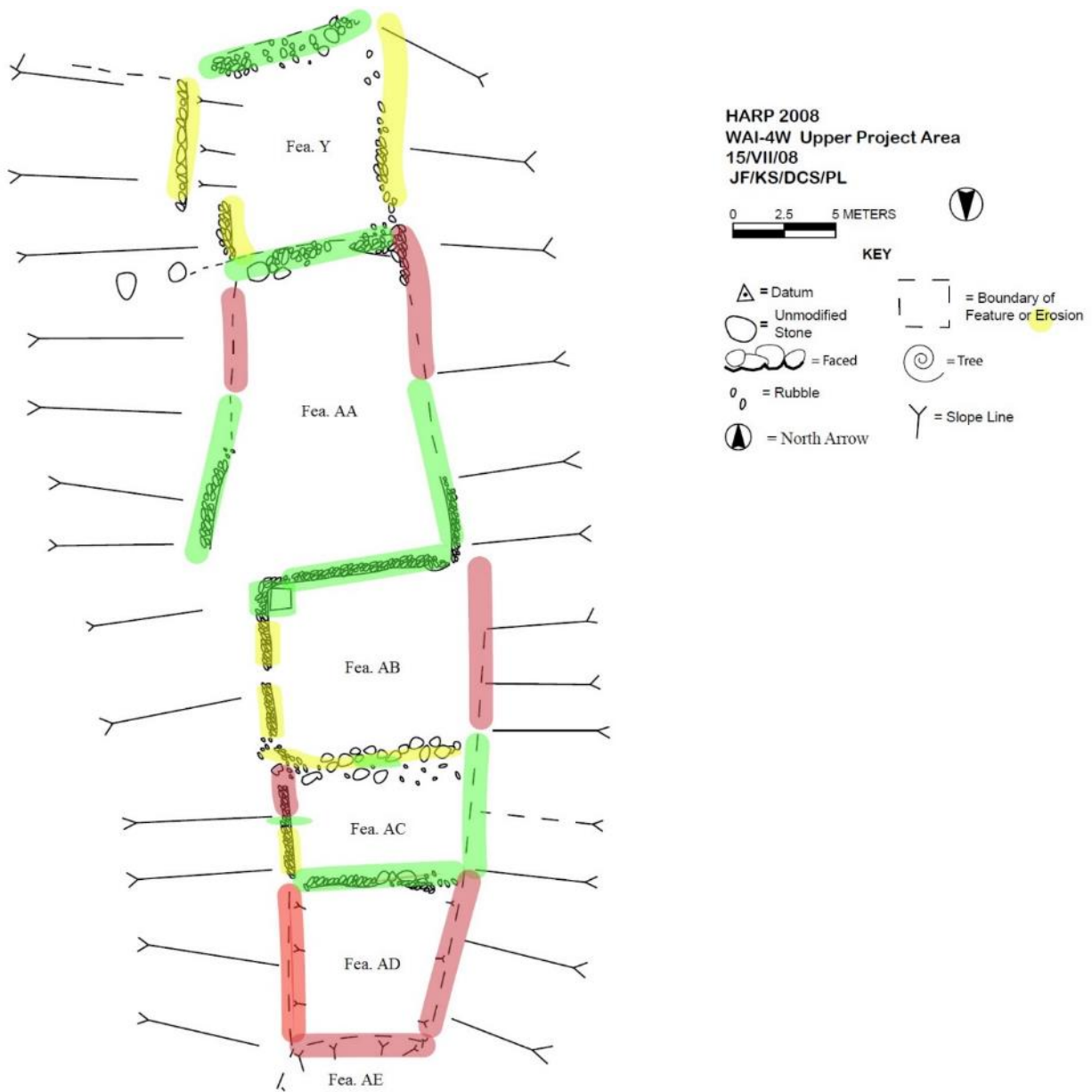


Figure 8. Condition Assessment map for WAI-4W features Y through AE. Original map from 2008 HARP report (McCoy and Graves 2008:39-44).



Figure 9. Condition Assessment map for WAI-4W focused on features AR and AS. Original map from 2008 HARP report (McCoy and Graves 2008:39-44).

**Table 6. Assessment of Individual features within Site WAI-4W.**

Site Data*	Context Integrity	Site Condition and Functional Value	Site-specific Threats to Stability/ Integrity	Site-specific Health & Safety Concerns	Pedestrian Access	Hiking Time
WAI-4W-Y Barrage Terrace	<b>5 – High.</b> Location in sequential system of terraces in excellent state of preservation provides high level of context for function as an agricultural terrace and/or for water or soil retention or movement	<b>6 – Good to Excellent.</b> Retaining walls are in primarily good condition. Area contains only moderate vegetation. Guava tree growing in center, some overgrowth above the West and East retaining walls	1.Vegetation overgrowth near East and West retaining walls  2.Large tree & root system in center of terrace  3.Cattle	1.Potential tree fall  2.Mosquitoes	Hiking trail	2:11 min.
WAI-4W-AA Barrage Terrace	<b>5- High.</b> Location in sequential system of terraces in excellent state of preservation provides high level of context for function as an agricultural terrace and/or for water or soil retention or movement	<b>5 – Good.</b> Retaining walls primarily in excellent condition with portions in poor condition, or destroyed. . Area contains only moderate vegetation. A guave tree and root system is growing in the center of the terrace	1.Erosion on Western and Eastern slopes adjacent to feature  2.Guave tree and root system in center of terrace  3.Cattle	1.Potential tree fall  2.Loose rocks within terrace  3.Mosquitoes	Hiking trail	2:11 min.
WAI-4W-AB Barrage Terrace	<b>5 – High.</b> Location in sequential system of terraces in excellent state of preservation provides high level of context for function as an agricultural terrace and/or for water or soil retention or movement	<b>5 - Good.</b> Retaining walls in primarily excellent condition with the exception of the West wall which is potentially washed out. . Area contains only moderate vegetation. Guave tree and root system in center of terrace	1.Bioturbation from trees and cattle  2.Erosion from Eastern and Western slopes adjacent to feature  3.Guava tree and root system in center of terrace	1. Potential tree fall  2.Loose rocks within terrace  3.Mosquitoes	Hiking trail	2:11 min.
WAI-4W-AC Barrage Terrace	<b>5 – High.</b> Location in sequential system of terraces in excellent state of preservation provides high level of context for function as an agricultural terrace and/or for water or soil retention or movement	<b>5 - Good.</b> Retaining walls primarily in good condition with portion of the East wall in poor condition, possibly washed out. Area contains only moderate vegetation.	1.Erosion on Western and Eastern slopes adjacent to feature  2.Bioturbation from cattle and trees	1.Potential tree fall  2.Mosquitoes	Hiking trail	2:11 min.



Terrace	an agricultural terrace and/or for water or soil retention or movement		overgrowth	2. Mosquitoes		
WAI-4W-AE Barrage Terrace	<b>5 – High.</b> Location in sequential system of terraces in excellent state of preservation provides high level of context for function as an agricultural terrace and/or for water or soil retention or movement	<b>2 – Poor to Fair.</b> Retaining walls in primarily poor condition and/or blown out. Feature is highly overgrown with vegetation	1.Vegetation overgrowth 2.Bioturbation from cattle	1.Thick vegetation 2. Mosquitoes	Hiking trail	2:11 min.
WAI-4W-AR Barrage Terrace	<b>5 – High.</b> Surrounding terraces and nearby Ti leaf plantings suggest human use and potential function in cultivation. Presence of potential burials suggests potential habitation	<b>4 – Fair to good.</b> Retaining walls primarily in poor condition with the Western wall being in excellent condition. Some vegetation overgrowth	1.Vegetation overgrowth 2. Bioturbation from cattle and trees 3. Soil Erosion	1.Potential tree fall .	Hiking trail	1:15 min.
WAI-4W-AS Barrage Terrace	<b>5 – High.</b> Surrounding terraces and nearby ti leaf plantings suggest human use and potential function in cultivation. Presence of potential burials suggests potential habitation	<b>5 – Good.</b> Retaining walls in primarily fair to good condition. Some vegetation overgrowth	1.Vegetation overgrowth 2. Bioturbation from cattle and trees 3. Soil Erosion	1.Potential tree fall .	Hiking trail	1:15 min.

**Table 7. Overall Assessment of Site WAI-4W.**

Site Data*	Context Integrity	Site Condition and Functional Value	Site-specific Threats to Stability/ Integrity	Site-specific Health & Safety Concerns	Pedestrian Access	Hiking Time
WAI-4W Barrage Terrace Complex	<b>5 – High.</b> System of sequential terraces suggests use of the area in agriculture, or possibly for water retention or movement. Area is very conducive to the growth of native and Polynesian-introduced plant species. Nearby presence of ti leaf plantings and potential burials near features AR and AS suggest human function in either agricultural and/or habitation.	<b>4.375 – Fair to Good.</b> Variation in current functionality of retaining walls from poor to good or even excellent. Area is very conducive to the growth of native and Polynesian-introduced plant species. Generally moderate vegetation. Some vegetation growth and root systems in center of terraces, and some vegetation overgrowth near East and West retaining walls	1.Vegetation overgrowth 2.Bioturbation from cattle and vegetation 3.Soil erosion 4.Flooding	1. Potential tree fall. 2.Thick vegetation 3.Mosquitoes 4.Loose rocks	Hiking trail	1:15 – 2:15 min.

**Table 8. WAI-4W access points and logistics.**

Access	4 – Wheel drive from county Road	Hiking Time from accessible roadway	Pros and Cons of this Access Route	Comments
Hiking trail	14:19 min. along private access road on 'Akonipule Hwy	2:15 min to inland features (Y-AE) 1:15 min to seaward features (AR and AS)	<ol style="list-style-type: none"> <li>1. Easily accessible with 4x4 vehicle.</li> <li>2. Short hike</li> <li>3. Hiking trail is steep with loose dirt</li> </ol>	

## WAI-4W Condition

### *Context Integrity*

The Features of WAI-4W examined within this report, namely features Y, AA, AB, AC, AD, AE, AR, and AS (McCoy and Graves 2008:39-44) are all part of a sequential system of barrage terraces (Kirch 1977:260-261) within a dry gully topographical setting. The presence, and positioning of these terraces suggests that they may be agricultural in function, and/or may function to retain and/or move water. The retaining walls of these terraces are easily visible, and the nearby presence of ti leaf plantings and potential burials near Features AR and AS suggest human interaction and possible habitation. The area is conducive to the growth of native and Polynesian-introduced plant species. Overall, site WAI-4W has a high context integrity as a system of barrage terraces for potential agricultural and/or water retention functions. It earns a rating of five on a scale of one to five.

### *Site Condition and Functional Value*

In general, the various retaining walls in WAI-4W are preserved in good to excellent condition (see Appendix D, Figure 15), especially in the inland portions where features WAI-4W-Y to WAI-4W-AE are located. However, some of the retaining walls are in poor condition or are even washed out. The presence of washed out retaining walls may be evidence of potential flooding threats primarily affecting the East and West retaining walls adjacent to the slopes of the gully. Water may be running down the slopes of the gully on the East and West sides impacting the eastern and western walls, and then continuing downwards in a northward progression causing secondary impact to the walls in a North-South facing orientation. This inland area has only moderate vegetation. Some tree growth occurs in the center of some of these terraces (see Appendix D, Figure 28), and there is some occurring vegetation growth on and near portions of the Western and Eastern retaining walls (see Appendix D, Figure 24). Though it is apparent that the walls may serve some function in the movement or the retaining of water, no source of water has been verified as providing continuous irrigation to WAI-4W. However, it seems likely that WAI-4W may have possibly been supplied at one time by 'Ōpaepilau. This potential source of water is still under investigation as well as the intended primary function of the barrage terraces at WAI-4W. The area is conducive to the growth of native and Polynesian-introduced plant species. Overall the Site Condition and Functional Value of site WAI-4W is Fair to Good Site, earning a rating of 4.375 on a scale of one to seven.

### *Site Specific Threats to Stability/Integrity*

Site WAI-4W is primarily threatened by vegetation overgrowth, and bioturbation resultant of cattle and vegetation. Many of the retaining walls have vegetation overgrowth occurring either on the wall itself (see Appendix D, Figure 24), or nearby. Bovine bone (see Appendix D, Figure 25 and 26) and feces found within the features suggests previous and continued activity and potential destruction of features by cattle. Subsequently, the additional threat of soil erosion may also result from the damage to retaining walls by cattle. Tree growth and associated root systems occur in the center of some of these terraces and present potential damage to the retaining walls as a result of tree fall and/or uprooting (see Figure 10. June 19 frame 128 above). Tree and root systems growing within, or very near to retaining walls pose a threat of massive

damage to the retaining walls should these trees fall and be uprooted (see Appendix D, Figure 27).

### *Site Specific Health and Safety Concerns*

Along with the general hazards presented by forested areas as described previously under Site WAI-2, Primary threats to safety within WAI-4W occur from the potential tree fall from dead limbs, and entanglement in thick vegetation; though the density of vegetation in WAI-4W is not as great as in WAI-2. There is also a greater presence of mosquitoes in WAI-4W.

### *Site Accessibility*

Site WAI-4W may be accessed via the same private road along 'Akoni Pule Highway used to access Site WAI-2. A four-wheel drive vehicle is necessary to traverse this road. The drive takes approximately 14 minutes. Once parked, WAI-4W is reached via an approximately two-minute long hike down a steep trail with loose footing to feature WAI-4W-AH, then up a moderate grade in order to reach the inland portions containing features WAI-4W-Y to WAI-4W-AE. A moderate hike down a gradual decline from the parked cars will take approximately one minute to reach the seaward features WAI-4W-AR and WAI-4W-AS. Many other access points exist for entry into various portions of site WAI-4W.

## RESTORATION ANALYSIS

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### Strengths, Weaknesses, Opportunities, and Threats (SWOT)

A SWOT analysis was used as a structured planning method to develop recommendations in regards to restoration through the evaluation of strengths, weaknesses, opportunities and threats involved in the project. This planning process allowed the students to think in-depth in regards to the internal and external factors that would affect the potential restoration projects. The analysis focused on the evaluation of both study sites, WAI-2 and WAI-4W through the three main categories of information looked in detail for this study- ethno-historical value, ethnographic (community value), and archaeological (physical & material record) value. In this analysis, Strengths and Weaknesses refer to currently existing positive and negative conditions and are correlated to the following short-term recommendations. Opportunities and Threats refer to potential factors that may aid or inhibit work within the associated category and are correlated to the following long-term recommendations.

#### Ethno-historical Summary:

The SWOT for the ethno-historical component of this study is summarized in the table below. For this section, it looked at both regional (macro) and Wai'āpuka specific (micro) considerations. It did not have however clear distinctions between the study sites because of the lack of detail in the community record regarding specific historical activities that took place there. It was clear from the information that was researched, summarized, and evaluated that a clear strength related to this area was the existence of regional historical information that was valuable in understanding land use and historical events. Also, there was a clear connection of the land of Kohala to Kamehameha I, its most important historical figure that went on to unite the Hawaiian Islands. Kohala served as a home for Kamehameha who was born and raised in this territorial district and frequented the areas of Hālawā to Wai'āpuka in the windward region. The uniqueness of the topography and land tenure use that is documented also adds to the strength of the area. A clear weakness that emerged was that there was a lack of place specific information concerning land and history, as well as a lack of accessibility to resources that would contain any knowledge related.

Some threats that correlated to the weaknesses were the potentiality for restoring a site to its original intent (form and function). In many cases there was not enough specific information or baseline data that would allow us to know for sure how things were built or what activities took place with any certainty. Another threat was the challenges to create curriculum containing knowledge directly relating to the ahupua'a of Wai'āpuka because of the lack of place specific information. However, an opportunity was the abundance of knowledge related to regional information, and educational curriculum could be created there. To go along with this, certain information pertaining to traditional mo'olelo and place names can be gathered, synthesized and then disseminated to the public connecting people back to the land and further strengthening their Hawaiian Identity. Based on this planning method regarding the ethno-history Wai'āpuka, some level of historical restoration could be achieved.

Wai‘āpuka Restoration Plan SWOT Analysis Ethno-Historical	
Strengths (S)	Weakness (W)
<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Existing Regional Information</li> <li>2. High Cultural Value from connection of sites to Kamehameha</li> <li>3. Uniqueness of the topography and land tenure</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Micro</b> <ol style="list-style-type: none"> <li>1. Lack of information pertaining to land and history</li> <li>2. Lack of ability to access knowledge</li> </ol> </li> </ul>
Opportunities (O)	Threats (T)
<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Connecting people to place through knowledge</li> <li>2. Use in larger cultural context to understand Wai‘āpuka history for educational purposes.</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Micro</b> <ol style="list-style-type: none"> <li>1. Uninformed restoration</li> <li>2. Uninformed cultural practice</li> <li>3. Education (site specific)</li> </ol> </li> </ul>

### Ethnographic Summary

The SWOT for the ethnographic component of this study is summarized in the table below. For this section, it looked at both regional (macro) and Wai‘āpuka specific (micro) considerations. It did not have however clear distinctions between the study sites because of the lack of detail in the community record regarding specific historical activities that took place there. Some of the strengths included that there exists a high community interest to restore cultural sites in Wai‘āpuka and landowners are supportive of community members restoring these areas. Another strength is that ‘āina based programs in Kohala already exist, which could lead to future collaborations and partnerships between people that could further unite and empower the community. In regards to Wai‘āpuka, there are still cultural sites on the landscape that families continue to have ties to, along with sites relating to Kamehameha such as the Wai‘āpuka Tunnel and Kamehameha Pond that are still intact. Hawaiian culture is valued by the community and ‘ike has been generationally shared and passed down. Another strength is that intergenerational participation and learning is valued. Some of the weaknesses that were identified are that restricted access and permitting processes complicate initiatives of community members getting onto the land to mālama ‘āina. Additionally, because restricted access is an issue, there are areas in Wai‘āpuka that are overgrown with invasive vegetation and ungulates damaging cultural sites and endangering native plant vegetation. In addition to restricted access, there are a lack of farmers, volunteers, and staff to develop, lead, and maintain restoration projects.

Some threats are that funding for future initiatives are uncertain and multiple stakeholders have differing views on restoration. But an opportunity is that the community may want to collaborate with Kamehameha Schools on restoration possibilities, which could lead to Wai‘āpuka being used as a potential model of restoration and revival of traditional cultural practices. If the landowners and community can work together, the threat on the dependency of funds and sales of lands affecting access could be better communicated and understood.

Perhaps, landowners and community members could work together to develop a comprehensive management plan for Wai‘āpuka which could lead to the restoration and reuse of traditional agricultural sites. Although there aren’t many community members with direct ties to Wai‘āpuka, an opportunity is that there is a high interest to restore cultural sites. Restoration plans would allow more locals and ‘Ōiwi to reconnect with the ‘āina, which could lead to spiritual healing of the community.



Wai‘āpuka Restoration Plan SWOT Analysis Ethnographic (Community)	
Strengths (S)	Weakness (W)
<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Sustainability initiatives are in place</li> <li>2. Strong community capacity</li> <li>3. Existing collaboration &amp; partnership</li> <li>4. Hawaiian culture and ‘āina are valued by the community</li> <li>5. ‘Ike of wahi pana have been passed down through the generations</li> </ol> </li> <li>• <b>Micro</b> <ol style="list-style-type: none"> <li>1. Families are genealogically tied to Wai‘āpuka</li> <li>2. High community interests in reconnecting to Wai‘āpuka</li> <li>3. Existing cultural features where families are still connected to</li> <li>4. Sites relating to Kamehameha are intact (Wai‘āpuka Tunnel &amp; Kamehameha Pond)</li> <li>5. High community interest to restore areas in Wai‘āpuka</li> <li>6. Landowners are supportive of restoring cultural sites in Wai‘āpuka</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Restricted access</li> <li>2. Limited funding for restoration projects</li> <li>3. Limited relationships with land owners</li> <li>4. Short lived projects</li> <li>5. Complicated permitting procedures</li> <li>6. Lack of staff (accounting, grant writing, volunteer coordinator, farming)</li> </ol> </li> <li>• <b>Micro</b> <ol style="list-style-type: none"> <li>1. Restricted access</li> <li>2. Lack of people directly connected to Wai‘āpuka</li> <li>3. Lack of people with expertise in opening up, restoring, and farming lo‘i</li> <li>4. The community doesn’t own land in Wai‘āpuka</li> </ol> </li> </ul>
Opportunities (O)	Threats (T)
<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Development of future collaborative partnerships</li> <li>2. Strengthening connection to place</li> <li>3. Economic viability</li> <li>4. Empower community capacity</li> <li>5. Incorporating ‘āina based learning and ancestral knowledge in local educational curriculum</li> <li>6. Locals to get back on the ‘āina</li> </ol> </li> <li>• <b>Micro</b> <ol style="list-style-type: none"> <li>1. Collaborations</li> <li>2. Creating a comprehensive management plan with community and landowner input</li> <li>3. Wai‘āpuka could be used as a potential model for restoration and revival of traditional cultural practices</li> <li>4. Restoration and sustainability projects could generate economic viability for the community</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Restricted access to lands</li> <li>2. Differing agendas in the community</li> <li>3. Projects can be unsustainable</li> <li>4. Uncertain funding sources</li> <li>5. Unknown land ownership and interests</li> </ol> </li> <li>• <b>Micro</b> <ol style="list-style-type: none"> <li>1. Funding for future initiatives is uncertain</li> <li>2. Contested rights to land between family and community members causing pilikia</li> <li>3. Differing views on restoration</li> <li>4. Projects can be short lived and unsustainable</li> <li>5. Land would have to be leased</li> <li>6. Lack of staff (accounting, grant writing, volunteer coordinator, farming)</li> </ol> </li> </ul>

**Archaeology Summary**

The SWOT for the archaeological component of this study is summarized in the table below. For this section, it looked at both regional (macro) and Wai‘āpuka specific (micro) considerations. It also looked specifically at the differences between the two proposed restoration sites. Both sites had some degree of archaeological documentation done to them, and also both sites had limitations in regards to understanding what was left of the system. WAI-2 had a clear source of

water for irrigated agriculture, while WAI-4W that was situated inland and away from a stream source, did not. WAI-4W did however have more points of entry for access than WAI-2. In regards to site integrity, WAI-2 had clear components of its irrigation still intact, but in general the actual construction of terrace walls and features was better for WAI-4W. Both sites had some degree of threats from vegetation overgrowth and erosion. In general WAI-2 was a classic irrigated agricultural site, while WAI-4W was comprised of barrage terraces and it was somewhat unclear how it functioned.

There were a number of threats for both WAI-2 and WAI-4W as it related to the structural integrity of the retaining walls presented by vegetation overgrowth and the potential falling of large trees and their associated root systems within the centers of the terraces and within the retaining walls. Evidence of washed out retaining walls and berms suggest that erosion and flooding are also continual threats to the integrity of these sites. Bovine bones and feces found either in or near the sites show the immediate threat of bioturbation by cattle. In the case of site WAI-4W, the source of water which feeds it as well as the primary function of the barrage system has not yet been verified. Previous cultivation of sugar in the area has resulted in many of the older irrigation ditches being covered up and has made it more difficult to identify this potential source of water for WAI-4W. Access to the site is difficult given, the multiple permissions required from multiple land owners. In regards to opportunities, retaining walls could be restored to functional status. Invasive vegetation could be cleared in order to prevent damage to the retaining walls. The 'auwai and po'o wai systems could be restored in order to provide irrigation to the terraces as well as to provide a means of flood mitigation. Measures can be taken to prevent erosion and retain soil. Increased access including improvement of previously existing roads leading directly to the sites (namely WAI-2) can increase efficiency in clearing of vegetation and restoration of the sites. Engaging land owners in restoration efforts may enable greater ease of access to the sites.

## Wai‘āpuka Restoration Plan SWOT Analysis Archaeology

Strengths (S)	Weakness (W)
<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Ditches and drainages are already mapped</li> </ol> </li> <li>• <b>Water supply</b> <ol style="list-style-type: none"> <li>1. Site WAI-2 has close proximity to water</li> <li>2. Vegetation and Landscape Restoration</li> <li>3. Area is very conducive for the growth of native plants (WAI-2)</li> </ol> </li> <li>• <b>Access</b> <ol style="list-style-type: none"> <li>1. Many points of access to enter site (WAI-4W)</li> </ol> </li> <li>• <b>Site Integrity</b> <ol style="list-style-type: none"> <li>1. Intact Po‘owai (WAI-2)</li> <li>2. Slope elevation is conducive to water flow in terraces (WAI-2)</li> <li>3. Retaining walls are easily visible (WAI-2 &amp; WAI-4W)</li> <li>4. Retaining walls are in good to excellent condition (WAI-4W)</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Some ditches covered up due to previous sugarcane cultivation</li> </ol> </li> <li>• <b>Water Supply</b> <ol style="list-style-type: none"> <li>1. No verified source of water (WAI-4W)</li> </ol> </li> <li>• <b>Site Integrity</b> <ol style="list-style-type: none"> <li>1. Some retaining walls are in poor condition or washed out (WAI-2 &amp; WAI-4W)</li> <li>2. Vegetation overgrowth (WAI-2 &amp; WAI-4W)</li> <li>3. Large roots and trees present in terraces and retaining walls (WAI-2 &amp; WAI-4W)</li> <li>4. Erosion (WAI-2 &amp; WAI-4W)</li> </ol> </li> <li>• <b>Data Gap</b> <ol style="list-style-type: none"> <li>1. Unclear whether primary function of barrage terrace system was for agricultural purposes or for water retention and movement, or for a combination of these functions (WAI-4W)</li> </ol> </li> </ul>
Opportunities (O)	Threats (T)
<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Synthesize previous archaeology work and utilize it in restoring proposed areas to functional status</li> <li>2. Engage Land owners in restoration efforts</li> </ol> </li> <li>• <b>Water Supply</b> <ol style="list-style-type: none"> <li>1. Identify and restore ‘auwai (WAI-4W)</li> <li>2. Area may also be a dryland system not requiring a water supply (WAI-4W)</li> </ol> </li> <li>• <b>Vegetation</b> <ol style="list-style-type: none"> <li>1. Clearing of invasive vegetation may allow for regrowth of native and polynesian-introduced cultivars</li> </ol> </li> <li>• <b>Access</b> <ol style="list-style-type: none"> <li>1. Clear road to make restoration efforts easier (WAI-2)</li> <li>2. Continued access can allow for protection and maintenance of nearby cemetery (WAI-2)</li> <li>3. Easier to haul materials in and out (WAI-4W)</li> </ol> </li> <li>• <b>Site Integrity</b> <ol style="list-style-type: none"> <li>1. Restore retaining walls to functional status (WAI-2)</li> <li>2. Restore ‘auwai and existing po‘owai to effectively irrigate site (WAI-2)</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Macro</b> <ol style="list-style-type: none"> <li>1. Potential for flooding</li> <li>2. Lack of stable long-term funding for restoration efforts</li> </ol> </li> <li>• <b>Water Supply</b> <ol style="list-style-type: none"> <li>1. Potential disputes over water diversion (WAI-2 &amp; WAI-4W)</li> <li>2. Potential flooding (WAI-2 &amp; WAI-4W)</li> </ol> </li> <li>• <b>Vegetation Management</b> <ol style="list-style-type: none"> <li>1. Potential tree fall (WAI-2)</li> <li>2. Trees and roots present in retaining walls and center of terraces (WAI-2 &amp; WAI-4W).</li> <li>3. Bioturbation from cattle and trees (WAI-2 &amp; WAI-4W)</li> <li>4. Erosion (WAI-2 &amp; WAI-4W)</li> <li>5. Continued vegetation overgrowth can cause damage (WAI-2 &amp; WAI-4W)</li> </ol> </li> <li>• <b>Access</b> <ol style="list-style-type: none"> <li>1. Potential accessibility compliance issues (WAI-4W)</li> <li>2. Multiple access permissions required (KS and Surety) (WAI-2 &amp; WAI-4W)</li> </ol> </li> </ul>

## Overall Recommendations

Following the SWOT Analysis, recommendations were crafted for each of the sections regarding short and long term initiatives that could be done to help aid in the restoration of the selected agricultural sites in Wai‘āpuka ahupua‘a. Below are recommendations listed for the ethnohistorical, ethnographic, and archaeological components of this planning process.

### Ethnohistorical Recommendations:

In the Ethnohistorical component, a list of recommendations was compiled to encourage restoration (Table 9). Short term recommendations included to continue to gather information regarding Wai‘āpuka and develop ways to disseminate the information via online databases, and through educational curriculum. This could be achieved partly by sponsoring event series and having existing programs to partner with the community there. Long-term recommendations included bringing practitioners into the community to share ideas regarding traditional agriculture and sustainability. Also the promotion of place based curriculum and/or programs in Kohala schools would be a way to encourage the history to live again. In addition, it was recommended that genealogy and land research resource be made more accessible to the community.

**Table 9. Ethno-Historical Recommendations**  
**Wai‘āpuka Restoration Plan SWOT Analysis**  
**Ethno-Historical**

Short-Term Recommendations
<ul style="list-style-type: none"> <li>• Gather all information for Wai‘āpuka, synthesize info, and disseminate info.</li> <li>• Develop an online database, make information accessible via integration into curriculum; promote Kohala mele, promote capacity of Kupuna leaders</li> <li>• Sponsor ongoing series of events for Kohala-based knowledge &amp; experts to share their ‘ike with their own people (food good)</li> <li>• Running Ho‘olauna and Kūlia i ka Pono programs in Kohala</li> </ul>
Long-Term Recommendations
<ul style="list-style-type: none"> <li>• Involve various practitioners to share mana‘o concerning farming issues and sustainability (that are actively cultivating kalo and ‘uala) to advise what, where, and when cultivars should be planted and harvested</li> <li>• Develop and promote place-based educational curriculum and/or programs to be used in Kohala schools. Integrate existing programs into this curriculum Find more mo‘olelo/place names to help people become more connected to the place</li> <li>• Make genealogy and land research resources more accessible to the Kohala community</li> <li>• Fund genealogy and land research workshops</li> </ul>

### Ethnographic (Community) Recommendations:

In the Ethnographic (Community) component, a list of recommendations were created to encourage restoration (Table 10). Short term recommendations included building community capacity through support, collaboration and partnerships, working to develop criteria for access,

and make opportunities for stewardship and management. Long term recommendations included developing a community based management plan for the area, integrate specialized knowledge and experts from different fields in as support, support education and outreach at the schools.

**Table 10. Ethnographic Recommendations**

Wai‘āpuka Site Plan SWOT Analysis Ethnographic (Community)	
Short-Term Recommendations	
<ul style="list-style-type: none"> <li>• Work with neighboring landowners to develop a criteria and process for ease of access</li> <li>• Create opportunities for individuals to steward and manage proposed restoration sites within Wai‘āpuka</li> <li>• Support community development and capacity-building efforts</li> <li>• Develop an ‘Āina Ulu collaboration in Wai‘āpuka</li> <li>• Work with community groups to organize community clean up days</li> </ul>	
Long-Term Recommendations	
<ul style="list-style-type: none"> <li>• Develop a Wai‘āpuka management plan with landowner and community input.</li> <li>• Integrate specialized knowledge in various fields such as agriculture, biology, hydrology, culture, economics, community, education,</li> <li>• Develop a Kohala regional management plan through a series of stakeholder meetings</li> <li>• Encourage land stewardship through ‘āina-based, place-based curriculum at the local school level</li> </ul>	

**Archaeology Recommendations:**

In the Archaeology component, a list of recommendations was created to encourage restoration (Table 11). Short-term recommendations included immediate protection measures such as fencing the potential restoration sites to keep ungulates out and also to take the specific parcels out of future lease negotiations. Also, more archaeological work should be done to fully document the system and allow opportunities for community experts in traditional agriculture to come in to give advice. Long-term recommendations included assessing the systems of both sites for structural integrity, seek expert advice to what type of methods of agriculture might work, and document the access roads. Improvements on the land were also recommended such as paving or clearing the roads, dealing with invasive vegetation, stabilize stream banks walls, and implement measures for soil erosion.

**Table 11. Archaeology Recommendations**

Wai‘āpuka Site Plan SWOT Analysis Archaeology	
Short-Term Recommendations	
<ul style="list-style-type: none"> <li>• Establish and maintain fencing around the sites in order to protect them from cattle and pigs.</li> <li>• Remove cultural sites from future lease negotiations</li> <li>• Look to Kohala community experts in reopening and restoring ancient lo‘i systems</li> <li>• Conduct more archaeological investigation and gather as much data as possible prior to any restoration efforts               <ul style="list-style-type: none"> <li>○ Gather charcoal samples, soil samples, etc. and preserve portions of the sites for future data</li> </ul> </li> </ul>	

gathering.

### **Long-Term Recommendations**

- Assess the 'auwai and po'owai systems for structural integrity. Involve kupuna to advise this effort.
- Involve an expert to assess what type of agriculture may be feasible in site WAI-4W
- Have an expert assess the status of roads which may have existed previously. Seek input from kupuna who have lived in the area, such as Uncle Henry Ah Sam, who have first-hand knowledge of what these roads looked like and where they were.
- Make necessary improvements to these roads.
- Restore stream bank walls to mitigate flooding.
- Implement measures for erosion prevention and soil retention
  - Plant non-invasive vegetation for soil retention
  - Build temporary walls and or terraces (if appropriate) to prevent flooding.

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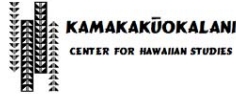
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## APPENDIX A – COMMUNITY RECRUITMENT LETTER



June 2014

Welina mai me ke aloha,

The University of Hawai'i at Mānoa, Kamakakūokalani Center for Hawaiian Studies in partnership with the Kamehameha Schools is holding a summer field course, titled HWST 467, Mālama 'Āina Field Methods in Kohala through the month of June in Kohala. Through this course we will be conducting research regarding land history and use of the region. The purpose of this research is to compile and synthesize community information regarding individuals and families knowledge of the Windward Kohala region. The outcome of this study will be a report and plan that will be submitted to the Kamehameha Schools to help them understand their cultural resources and plan for the potential restoration of specific cultural sites in the ahupua'a of Waiapuka, Kohala.

We are eager to collaborate with people who have knowledge of the Windward ahupua'a in Kohala. In particular we hope to gather information that relates to:

- \* 'Ohana and individual connections and relationships to the area
- \* Mo'olelo, place names, mele, oli, hula
- \* Past and present cultural practices and protocols
- \* Knowledge of natural and cultural resources
- \* Traditional and historic land use and ownership
- \* Traditional and historic events and persons
- \* Concerns and suggestions regarding future stewardship of these ahupua'a
- \* Referrals of kūpuna and kama'āina who might be willing to share their cultural knowledge of the area

If you feel you are eligible and would like to participate please contact the projects Principal Investigator, Dr. Kekuewa Kikiloi at [kikiloi@hawaii.edu](mailto:kikiloi@hawaii.edu), 808-479-6671. You can also contact project staff Kelley L. Uyeoka at [kuyeoka@hawaii.edu](mailto:kuyeoka@hawaii.edu), 808-265-328. If selected for this study, the study visits will take place at a time and location of your choice. Also a summary of the results of the study will be provided to you for your involvement.

We look forward to collaborating with you and the Kohala community on this endeavor.

Me ka ha'aha'a,

A handwritten signature in black ink that reads "Kekuewa Kikiloi". The signature is written in a cursive style.

Kekuewa Kikiloi, PhD  
Kamakakūokalani Center for Hawaiian Studies  
University of Hawai'i, Mānoa

U.H. IRB Approval Date 5/27/2014

## **APPENDIX B – KAMA‘ĀINA INTERVIEW QUESTIONS**

### **Background Information:**

- \* Name:
- \* When and where were you born:
- \* Where did you grow up:
- \* Mother & Father:
- \* Grandma & Grandpa:
- \* Occupation /Affiliation:
- \* Area of current residence:
- \* Personal/Family connection to the area:

### **Community Efforts & Access:**

- \* Have you done mālama ‘āina or restoration work in Wai‘āpuka or neighboring lands?
- \* How and/or why did you begin involvement in what you are doing?
- \* Do you have any concerns or recommendations regarding access to Wai‘āpuka?

### **General Restoration:**

- \* How can restoration of traditional cultural sites be valuable today?
- \* Are there any difficulties associated with restoring, working at, and maintaining traditional cultural sites?
- \* Are there areas in Kohala that stand out as being most important for restoration? Why?

### **Wai‘āpuka Restoration:**

- \* Are there certain sites in Wai‘āpuka you would like to see restored?
- \* Would you want to cultivate crops that were traditionally grown in the area? If so, do you have ideas on how this could happen?
- \* How do you feel about others individuals and groups working in Wai‘āpuka? Do you feel a certain family has a kuleana or right to the land?

- \* If a restoration plan were created for kamā'aina to restore and reuse areas of Wai'āpuka, what suggestions would you want included in the plan?
- \* What do you envision for Wai'āpuka?

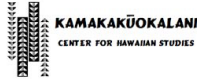
**Wai'āpuka Specific Questions:**

- \* Do you know of any cultural sites in the area and their function?
- \* What was the landscape like in Wai'āpuka when you were growing up?
- \* What did you grow in Wai'āpuka? Do you know what others grew here?
- \* Do you have any information on how the traditional agricultural system worked in Wai'āpuka?
- \* How much effort did it take to maintain the lo'i sites? How much food did the lo'i yield?

**Knowledge Sources:**

- \* Where does your knowledge come from:
  - o Knowledge passed on to you by 'ohana
  - o Knowledge shared with you by others
  - o Knowledge from sources such as written sources, archival sources, digital
  - o Your own direct knowledge through observation and practice

## APPENDIX C – INFORMED CONSENT FORM



### **Consent to Participate in Kohala i ka Unupa‘a Field Methods Program**

Aloha, my name is Kekuewa Kikiloi, Ph.D. and I am an Assistant Professor at the University of Hawai‘i at Manoa (UH) in the Kamakakūokalani Center for Hawaiian Studies. This summer I am holding a course called Hawaiian Studies 467 Mālama ‘Āina Field Methods course in the district of Kohala. The primary purpose of this course is to teach college students how to document and research the history, land and resources, and communities, of a region to help foster responsible land stewardship and management. I am requesting your participation in this research because of your knowledge of the resources in this region. We hope to produce a final report/plan that will evaluate Kamehameha Schools Waiapuka lands and propose how the area and cultural sites could potentially be restored.

**Activities and Time Commitment:** If you agree to participate, students will interview you at a time and place that is convenient to you. The interview will last 25-30 minutes and you will be recorded with a digital audio recorder. The interview will be informal and conversational as we hope to get your recollections concerning your experiences with the ‘āina.

**Voluntary Participation:** Your participation in this research project is voluntary. You are free to choose to participate or not. At any point in this project, you can also withdraw your permission.

**Benefits and Risks:** There is no direct benefit to you in participating in this research project. The results of this project will help the students learn about how to conduct field methods such as community interviews. We hope to create an authentic record and a reliable historical document that will be submitted to the Kamehameha Schools so that they can understand their resources better on their lands. It will also help them to understand the community concerns as to what is priority in regards restoration of the area. To do that, it is important that your actual name appears as the interviewee on the transcript and report. Thus, one possible risk is loss of privacy. If at any point you become uncomfortable or stressed by answering any interview questions, we can stop immediately, take a break, or eliminate the question all together. At any time you may also withdraw from the project all together.

**Privacy and Confidentiality:** For the duration of the study, all audio recordings will be stored on a password protected computer to ensure your privacy and confidentiality. Once interviews are completed, the students will transcribe the audio recording and check and edit the transcript for accuracy. You will receive a copy of the interview to make any changes necessary, and then we will incorporate this into the revision of the transcript. The excerpts of the transcripts will be incorporated into the final report to Kamehameha Schools. The audio file along with the original transcription file will be returned to you or be destroyed after the study is completed. You will receive a final copy of the report.

**Questions or concerns:** Please contact me, Kekuewa Kikiloi Ph.D. at (808) 956-0558 if you have any questions regarding this project. If you have questions about your rights as a research participant, you can contact the U.H. Human Studies Program at (808) 956-5007 or via email at [uhirb@hawaii.edu](mailto:uhirb@hawaii.edu).

To summarize, our research team understands our responsibility in respecting the wishes and concerns of the community members participating in this study. We promise to observe the following procedures:

1. The interview will not be recorded without your knowledge and explicit permission.
2. You will have the opportunity to review the written transcript and summary of your interview. At that time you may make any additions, deletions or corrections you wish.

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Dr. Kekuewa Kikiloi [kikiloi@hawaii.edu](mailto:kikiloi@hawaii.edu) 808.956.0558

3. You will be given a copy of the interview transcript and summary for your records.
4. You will be given a copy of this release form for your records.
5. You will be given a copy of any photographs taken of you during the interview.
6. The information gathered from this interview will be only used for the scope of this project and report. Any audio recording will be returned to you once our final report is written or destroyed.

For your protection, we need your confirmation that:

1. You consent to the audio recording of the interview for the purposes of this study  
Yes No
2. You consent to the use of the complete transcript and/or interview quotes for the purposes of this study.  
Yes No
3. If a photograph is taken during the interview, you consent to the photograph being included in this study.  
Yes No

**Agreement to Participate in  
Hawaiian Studies Kohala i ka Unupa'a Research Project**

*"I certify that I have read and that I understand the information in this consent form, that I have been given satisfactory answers to all my questions concerning the project, and that I have been told that I am free to withdraw my consent and to discontinue participation in the project at any time without any negative consequence to me.*

*I hereby give my consent to participate in this project and to the release of this interview and/or photograph to be used as specified above."*

\_\_\_\_\_  
(Printed Name of Interviewee)

\_\_\_\_\_  
(Signature of Interviewee)

\_\_\_\_\_  
(Date)

Provide a Copy of this Consent Form to the Participant

\_\_\_\_\_



## APPENDIX D – COMMUNITY INTERVIEWS

**Table 12. Kohala community interview participants (listed in alphabetical order by last name).**

<i>Name</i>	<i>Affiliation/Position</i>	<i>Response/Interview Date</i>
<i>Ah Sam, Henry</i>	<i>- Kohala kama‘āina raised in Wai‘āpuka and Niuli‘i</i>	<i>- Interviewed during site visit to Wai‘āpuka on June 12, 2014.</i>
<i>Cachola, Fred</i>	<i>-Kohala Kama‘āina - Maika‘i ka Makani o Kohala -Kohala Hawaiian Civic Club</i>	<i>-Led a huaka‘i visiting wahi pana in Kohala on June 3, 2014 (audio recorded).</i>
<i>Fuertes, David</i>	<i>-Executive Director of Ka Hana No‘eau</i>	<i>-Met at the Kohala Intergenerational Center on June 6, 2014.</i>
<i>Gomes, Mike</i>	<i>- Kohala kama‘āina - Former Surety employee</i>	<i>- Interviewed on his property in Niuli‘i on June 16, 2014.</i>
<i>Marshall, Kehaulani</i>	<i>- Director of Ulu Mau Puanui</i>	<i>-Interviewed at Puanui on June 10, 2014.</i>
<i>Naihe, Daisy</i>	<i>- Kohala kama‘āina raised in Wai‘āpuka</i>	<i>- Phone interview on June 19, 2014.</i>
<i>Svendsen-Hussey, Nani</i>	<i>- Kohala Kama‘āina raised in Wai‘āpuka and Niuli‘i - Steward of Kukui Lo‘i</i>	<i>- Interviewed at Kukui Lo‘i in Niuli‘i on June 13 and 14 2014.</i>

### Ethnographic Interview Write Ups

#### Uncle Henry AhSam

##### *Background*

On June 12, 2014 Ka‘alewaihili met with Uncle Henry Ah Sam at his home in Niuli‘i, Kohala. Uncle Henry’s father built the house, and the family moved into it in 1950. Uncle Henry shared about his family’s history in Kohala, primarily within the two Ahupua‘a of Wai‘āpuka and Pololū. Uncle Henry’s Grandfather, Hune Pilipi, was born in Wai‘āpuka on May 30, 1900 (Mitchell 2010:1). He married Rosalia Lono Haleia Kealaka‘a from Kona, and had 15 children. The family became known as Phillips after Grandpa Hune’s entrance into the U. S. Military during World War 2 (Mitchell 2010:4). When the American soldiers could not pronounce Pilipi

and chose instead to call him “Phillips” Grandpa Hune agreed, and the name stuck with the family since that time. Uncle Henry’s father worked for the plantation, and Uncle Henry shared some insight into local currency within the plantation community. The plantation workers were assigned Bongo numbers, which worked as a type of credit system within the community. The Bongo numbers were somehow given to merchants, and individuals would accrue a tab with the various establishments that would be paid off by the individual. Uncle Henry recalled that his father’s Bongo number was 17022, and recently Uncle Henry had rediscovered the brass circle, roughly the size of a silver dollar which had his father’s Bongo number inscribed upon it.



*Figure 10. Uncle Henry Ah Sam sharing his childhood memories with Ka’alewaihili at an area near the old Ah Sam house in site WAI-2.*

Uncle Henry Ah Sam graduated college in 1955 at which point he travelled to the United States for education. He attended Utah State University, then Brigham Young University. He remained in Utah for nine years where he taught school. However, Uncle Henry couldn’t stay away from home for long. “The yearning to come home was the key; in other words, all of my family live in Hawai’i.” Aside from missing home, Uncle Henry stated that there were other motivating factors in returning home to Wai’āpuka. After the sugar plantation folded in 1976, the company gave away land to each of its employees; Uncle Henry’s father was one of these employees, but did not want the land. “The local people, they not grabby” stated Uncle Henry regarding his father’s lack of interest in the land given out by the plantation. Uncle Henry explained that his father told him “If you don’t come back, we gonna give it back to the plantation, because it’s free.” So, Uncle Henry replied “Oh no, I comin’ home!” Uncle Henry received 15,000 square feet of property free of charge, which was a great help to him. Later, one of Uncle Henry’s uncles was also not interested in his land, and gave his parcel to Uncle Henry who in turn built a house on the property and sold it.

### *Visit to Pilipi 'Ohana House and Lo'i in Wai'āpuka*

After talking with Uncle Henry and his mo'opuna at his Niuli'i home, he took us into the inland of Wai'āpuka to show us where his 'ohana lived and farmed. He shared memories of his family's time there. As we pulled our vehicles near the area where we would hike in from, Uncle Henry instructed us to park so that we do not block access to a nearby property. The ability for families to access areas in the ma uka and ma kai portions of Kohala has been more difficult than in previous times. Uncle Henry stated that during plantation times access was "open, it was free. But after the plantation closed up, everything closed up. Private ownership came in, everything got fenced up. Gates started coming up, and that was a hard issue for the locals to accept, because as far as they were concerned they were free to roam."

The difficulty for Uncle and his family to access their old house lot, lo'i, and cemetery is the primary reason that they have been unable to visit and maintain these areas as well as they would like to. Uncle stated that the only person who has attempted to gain access to the area for clearing has been a person by the name of Diamond Ramond. However he was denied access by Surety as they felt that he had ulterior motives, wanting to use the access for hunting purposes.

As we approached the area where the old house used to be, Uncle Henry pointed out where the driveway used to be. "This is how we got in." He pointed out the roadway where the cars would drive in as well as the garage area where they would be parked. Uncle told us how his grandfather, Hune Phillip had gardens *ma uka* of the house and that he "gardened everything." His grandfather cleared the entire area for the garden himself; a feat which Uncle Henry states would be difficult even today for multiple young folks to accomplish, yet his grandfather did it all alone. An old 'ulu tree used to stand near the old house, and Uncle stated that "everytime we wanted something to chew on, hack the tree and all the sap that came out of the 'ulu tree, that's what we chewed; that's our gum I guess." Above the house is where they also raised cattle, roughly three to four, enough to feed a family.

For most of the kids living at the house, it was a treat for them to go out into town, as they primarily stayed at the house up ma uka with the exception of going to church on Sundays. They would attend the Mormon church down the road in Niuli'i, presently the area of Niuli'i cemetery, and Uncle Henry states that the name of this church was Painahala. Grandpa Phillip was the President of the church at that time. For Uncle Henry, who didn't live at the Wai'āpuka house regularly, Friday afternoons were a special treat. After school finished, he would get to go ma uka with the other 'ohana to Grandpa Phillips house and spend time away from town. Part of the treat in going there was being able to ride the horse to the house. Uncle stated that it was there that he learned how to use the kukui helepō as well as a hand torch used to go fishing.

Uncle Henry mentioned that the house was not really a big house, but it had running water and a faucet. There was a big kitchen, one big living room, two medium size rooms, and one small room. All the boys stayed in one room, and the younger siblings slept in the main room with the others. Uncle stated how perhaps at this house were the only times he really had prayer. It was truly an 'ohana affair; everyone gathered and sat down in the front room. They would all read a scripture, and each person wanted to be the one to choose their scripture first, which Uncle stated that the main mana'o of this scripture was "God is love." After the scripture reading, someone would offer a family prayer. At the end of the weekend, they would all walk down to

Painahala church. In order to keep their shoes clean while walking down the muddy road, the kids would carry them by hand as they walked. Prior to entering the church they would put their clean shoes on.

While we were in the area of the old house, Uncle Henry mentioned that he is still trying to find the old outhouse. He told us how Grandpa Phillip had thrown a rifle into the outhouse because the kids were using it to shoot out the windows of vacant houses. Around a year ago, Uncle Henry spoke with his brother living in Florida about finding the rifle and he laughed and said, “it’s not there anymore... after Grandpa threw it in we dug it out.” As we observed the area, Uncle pointed out that the area was really overgrown, but that it wasn’t always that way. “I really think it can be put back, if people would come up regularly” to clear and maintain the area. “And you look at it right now and say ‘Gee how are we gonna do it?’, but it’s possible.”

### *Lo‘i*

Making our way further towards the stream we approached the area where Uncle Henry’s ‘ohana had lo‘i kalo. Uncle Henry stated that there were about seven lo‘i in the area, but two to three of them were not too big, as bigger lo‘i can be harder to manage. The lower lo‘i were big, but “not too big.” There was an imu nearby for cooking the harvested kalo, “big enough for a family.” Uncle pointed out that the big trees were taking over the area, and that the *kukui* and *niu* trees were not there before.

When asked about the age of the lo‘i, Uncle stated that they “were already here.” In 1936, one of the people who helped to open the lo‘i stated that they were around 12 years old when the lo‘i was opened (or perhaps re-opened). A mule team was used to pull a large orange tree out from what would be the center of the lo‘i. Uncle noted that when making poi, if there was not enough taro to make poi, then they would add flour in order to thicken it. The pounding of the kalo into poi was the job of his father and grandfather.

The lo‘i are located near Waikama Stream, and Uncle stated that the “water was always steady” and that they rarely had any problems even during flood events. He pointed to an area roughly 10 feet above the current water level saying that the water would only raise to about that height during floods. There was only one storm that was so severe that his father wasn’t able to return home to Niuli‘i from the lo‘i, and had to stay the night in the valley until the water subsided. Uncle told us that at the end of the dam was a waterfall, and this was the source of electricity for the house, which was perhaps for awhile the only house in the area with electricity. A little below the water intake was an area that Uncle and his siblings would use as a swimming pool. At that time ‘o‘opu and hihiwai were prevalent in the stream, and that the water of the stream was suitable for drinking.

### *Family Cemetery*

Not far from the lo‘i is a cemetery in which some of Uncle Henry’s ‘ohana are buried, as well as members of other ‘ohana including the Naihe’s. Two of his uncles are buried there along with his grandmother, Rosalia Kealaka‘a. Uncle pointed out a barbed wire fence stating that one of the primary kuleana of his ‘ohana in visiting the cemetery is maintaining that fence so that the cows don’t intrude on the final resting place of their beloved predecessors. Unfortunately, due

to difficulty accessing the area, Uncle Henry and his family are only able to access the grave site approximately once a year. At the time of our visit, a portion of the fence was in disrepair. Uncle shared that every three years the family has a reunion, and one of the main activities is to visit and care for this family grave site. Uncle pointed out a pit near the cemetery stating that it was an imu perhaps created at one of these three-year reunions, though he could not recall the specific event for which it was made. Considering the importance of the cemetery to families, as well as the desire for this site to be maintained, and other areas such as the lo'i to be restored, Uncle Henry was asked if he had any preference as to who should maintain the areas. Uncle Henry stated that whoever maintains the area would need to be vigilant and "keep at it" in order to avoid any of these areas falling into disrepair again.

### *Old Catholic Church*

Uncle noted that they have one 'ohana member who was buried at the old Catholic church property, however, the exact location of where they are buried is not known. He stated that the head stone may have been moved around on five different occasions, and this is why the exact location of where this particular kupuna may not be known.

### *Acknowledging the Spiritual Presence of the Area*

Uncle Henry told us about how his grandfather would "feed the spirits." Sometimes at night Uncle Henry would hear his father outside saying aloud, "Tsa! Here you go" as he scattered 'ōkolehao around the yard. "Yeah they fed 'em" states Uncle Henry, "I've seen it; and they never bother us." Grandpa Phillip would do this after dinner or before he would go to sleep. Uncle Henry noted another occasion in which a family friend, John Wahamana was seen crawling on his hands and knees in the lo'i cared for by Uncle Henry's family in Makapala. Upon seeing this, Grandpa Phillip recognized that John was being held down by spirits and called out to them saying, "Hey, he's 'ohana, let him go!" and immediately he was able to stand up. Uncle Henry told us another story of a friend who would carry a heavy sack of kalo uphill each day, but he would be pushed uphill, assisted by spirits of the area. Uncle also recounted a story about how his father, while working in Pololū as a rice farmer, would wake up early in the morning and hear people whistling. So he would get up early and start getting ready. As he started travelling towards Pololū he would hear the whistling further ahead of him, and this would continue, "until he got into Pololū Valley. When he got into Pololū Valley, everyone was still sleeping. He said just kept hearing that whistle along the line, like 'c'mon hurry up" as if the ancestors were wanting him to hurry and make his way over there.

### *'Ōkolehao*

As we approached the stream Uncle Henry pointed out an area that his father and grandfather would utilize for distilling 'ōkolehao. He stated that they would produce it by the gallons, and that they were perhaps some of the only ones in the area making it. Uncle Henry described some portions of the process of making 'ōkolehao, noting the copper coiling used, as well as the benefit of having cold water available. There was also an imu nearby for use in making 'ōkolehao. As this distillation operation was not exactly legal, other people would serve as lookouts to warn if any cops were making their way into the valley in order to warn those at the

‘ōkolehao still. Uncle stated that they would fire a gunshot as a signal to warn the others that cops were in the area.

### *Pololū*

Uncle Henry told us about how his grandmother had a home by Pololū point around the area where Kindy Sproat lived. His grandmother would take him and the other kids into the valley to engage in activities such as fishing for ‘o‘opu. He mentioned a particular variety of ‘o‘opu in Pololū called napili. They would travel out towards the rice pond, which at the time was not being cultivated with rice. They would go early in the morning, and wait until late in the afternoon to leave. His grandmother told them that the reason they would wait until late afternoon to leave was because at that time, the sun would have passed the valley making the hike out much cooler. At the time there was an old shack in the area, but it has since been washed away, cleared out after a tidal wave in 1941. Currently there are hardly any ‘o‘opu in the streams; Uncle stated that once the prawns were introduced, they wiped out everything. However, it seems that the hihiwai are starting to come back.

### *Kēōkea*

Uncle Henry discussed gathering lauhala when he was younger. The leaves would sell for one cent each, and were sold in bundles of 100 leaves. They would gather lauhala beginning at Kēōkea, and walk across Kohala to Pololū, gathering the leaves as they would go, up until they reached the Pololū lookout. There the buyer would meet them in his truck at the end of the day and pick up the bundles of lauhala.

### *Next Steps*

When asked what he would like to see happen with the area in Wai‘āpuka where his family lived and raised kalo, Uncle Henry stated that the area should be cleared out first, then what needs to be done can be seen. He states that “everything is still there. The lo‘i are still outlined.” The whole area is shaped in a triangle, and the water returns to the kahawai. For someone to just come out and clear the area would help a lot; perhaps encouraging others to continue working the area. “Opening a road to come in is not too hard” and would perhaps make restoration work even easier.

Uncle Henry stated that if he were to go back and clear the area himself, he would start by first clearing the roadway area leading to where the old house stood before. He would repair the road leading to it so that it would be easier to drive vehicles, especially trucks closer to the work area. In this manner, it would be easier to remove any debris and vegetation removed during clearing and make continued efforts to restore and maintain the area much easier and more efficient. Alternatively, another good way to begin restoring the area would be to “drop down and let the water in” working on the po‘owai, just ma uka of the lo‘i area near the stream, and clearing the ditch (possibly ‘auwai) that ran through the lo‘i near the house area, subsequently feeding the lower lo‘i, continuing past the house, and returning into the stream near the area of the road.



With very few family members left who are willing and/or able to care for the area, Uncle admitted that restoring the lo'i can be a challenge. When he first left the islands to pursue his education, Uncle Henry had a desire to reopen this area when he returned, though this vision has been difficult to fulfill. However, as Uncle Henry stated repeatedly throughout our time with him, "It's possible." With determination and perserverance, this goal is one that can definitely be obtained. "Hard work, that's it!"

## Uncle Fred Cachola

### *Introduction*

On June 3<sup>rd</sup>, 2014, the Ka'alewaihili Field School students and staff met with Uncle Fred Cachola, a well-known community member of Kohala. Upon meeting Uncle Fred, he gave a brief background of himself. Born and Raised in Kohala, he is a 1953 graduate of Kamehameha Schools. He attended the University of Northern Iowa and majored in Education and History. It is here where he learned of a portion of Hawai'i's history that he never learned before and thus began this journey and passion. As he explained to our group, after learning about Hawai'i's history, majority of his papers were focused on the illegal overthrow of the Hawaiian Kingdom, in which at that time he was accused of writing to start a revolution at his school. Nonetheless, in 1966 he received his Masters of Arts in History and Philosophy of Education at The University of Hawai'i at Mānoa. It is here he studied about Kohala, Rev. Elias Bond and Kamehameha. He has three daughters, all of whom do research with him. Together they call themselves the Native Hawaiian Research 'Ohana. From the research they have compiled over the years, Uncle Fred took us on his popular daylong huaka'i to different wahi pana throughout Kohala.



*Figure 11. Fred Cachola sharing mo'olelo during the first leg of our huaka'i.*

### *Access*

Uncle Fred expressed concerns with access. “It’s not just Wai‘āpuka, it’s the whole Kohala coast.” One issue is the knowledge and awareness of what is and is not legally accessible to the public. A lot of people do not know where the public rights of way are. “Sometimes Kohala people don’t care; if they want to go down to the beach, they just go. Where there were no gates and now there’s a gate, they just walk around the gate. If it’s not public, how do we get to the area anyway?”

A question he asks is, “what is a public access?” Access along the makai side is very important because it is traditional access for fisherman. He mentions that there are old traditional costal trails that are still public access which are hampered by legalities saying they cannot go, where generations before had experienced it as open and free range. He feels, “makai should be public access.” On the mauka side, plantation cane field roads were once their access to the lands. Today, gates and private property prevent people from going to Wai‘āpuka unless they have a key. Furthermore, one thing Uncle Fred would like to see access to the mauka trail which connects Wai‘āpuka to Pololū. According to Uncle Fred this was the trail that was used by kūpuna for hundreds of years. It is not unique to Wai‘āpuka, this trail goes from “Neue, Wai‘āpuka, and Pololū all the way to Kawaihae.” He says it is important to not only look at segments of the trail but the entire trail. Uncle Fred noted, “What would really help is if there was a legal definition of what traditional legal access is, and what continues to be that, and where.”

### *Personal Family Connections*

Although Uncle Fred said he has no personal family connection in Wai‘āpuka, when growing up he knew and spent time with people that lived in the area. Some of these families were the Sproat’s, Rodenhurst’s, Ching’s, Shim’s, Cazimero’s and the Lim’s. He also spent some time with the Neula family down the road from Aunt Nani’s house in Niuli‘i.

### *Family and Kuleana to the Land*

When asked if he felt certain family has a kuleana or right to the land in Wai‘āpuka, his response was, “The ones that used to live in this area.” He first suggested the descendants of John Palmer Parker, who lived in Wai‘āpuka. Uncle Fred’s reasoning for this was that the land was granted to him from Kamehameha and later was commissioned to hunt and shoot wild cattle. For better insight on particular families connections to the area, he suggested we talk to people who knew the families that lived in Wai‘āpuka and some of the old timers such as the Sproat’s, Raymond’s, Cazimero’s, Bader’s, Rodenhurst’s, Mary Lim, and Rose Maeda. In addition, there was an old Hawaiian man in the Raymond family that lived by himself in Pololū, which Uncle Fred recommended was an important family to talk to because they had kūpuna living in that area. Lastly, he spoke of an old man whose last name was Kinney and who lived at Wai‘āpuka mauka above the old trail that went to Pololū valley. Uncle Fred thinks he may have passed on, or if he is still alive, he would likely be in his 80’s or 90’s.





*Figure 12. Uncle Fred talking with Oliver and Mealani Mo'okini-Lum at Mo'okini heiau.*

### *Waiāpuka Tunnel*

The first time Uncle Fred visited the Waiāpuka Tunnel, was around 1962, the land was all in cane fields and he had no idea where it was. An old man came up the trail from Pololū with his mule train and Uncle Fred asked him if he knew where the tunnel was. The old man took him through the cane fields all the way to the edge of the stream. At that time, Uncle Fred noted that he was able to identify the tunnel entrance as well as two to three shafts, but beyond that he didn't see anything else. Several years later, he and his daughter went back and saw that the plantation had walled up the tunnel entrance, so the water could no longer flow through.

### *General Restoration*

Uncle Fred shared some of the difficulties he's experienced in the past associated with restoring, working with, and maintaining cultural sights. The first is trying to figure out who owns the land. As mentioned before, access and private land is an issue whereas, when he was a kid, getting in trouble for trespassing was not an issue. "Now, you constantly have to worry about trespassing." Another challenge is trying to determine what the land owner wants to do with the land and being able to collaborate with the land owner to either save, restore, protect, or preserve significant features and wahi pana on the land. He explained that you must, "get the landowner to realize the importance of what they own, cause sometimes, they don't know". He always tries to persuade the landowners to protect, preserve and mālama the cultural sites on their land.

Another concern of Uncle Fred's is the lack of kama'āina knowledge and the effects of archeologists who have come into Kohala and speculated what they saw. Uncle Fred shared an example at Pao'ō Ahupua'a, where an ancient burial was mistaken for a fishing shrine and a wealthy man wanted to build his extravagant vacation complex next to it.

### *Groups and People working in Wai'āpuka*

Uncle Fred has a slight concern with a range of different volunteer coming out to work on the land and have little experience in recognizing and protecting significant cultural and natural resources. While not wanting to dampen a person's zeal for wanting to help, he suggested that restoration efforts should encourage volunteer help but try to control and manage it at the same time. "How do you encourage and balance, the sincere efforts of volunteers, who have good feelings and respect about a site, with their lack of knowledge about archaeology, protection and preservation of those sites?"

In regards to people working on restoration Wai'āpuka, he suggested that groups such as the Kohala I Ka Unupa'a Field School would be great candidates to work on the 'āina. He considers cultural sites so important it that it is critical that groups who are restoring or studying Wai'āpuka should be guided by professional resource managers and have a deliberated planned process. "It might give people a good feeling to get their hands in the dirt and cut a few trees or do something but if you don't know what you're doing, you shouldn't be in there." He would like to see legitimate groups, experienced managers, supervisors, and planners work with communities and do projects with a purpose.

Another idea Uncle Fred shared was to develop a regulatory agency like a Kohala Historical Society. As he explained, there is no community agency or organization who governs or regulates or manages and protects Kohala's cultural and natural resources. "Anybody can come in, tour the district and fool around with archeology, field research on Kohala's cultural and natural resources" According to Uncle Fred, he's not even sure if that's legal. Additionally, he has an issue of people wanting to random and sometimes reckless archaeological studies and raises question, "Should that be regulated? Or should just be open house?"

### *Restoration in Wai'āpuka*

Uncle Fred would like to see traditional food crops include kalo, ulu, and 'uala and yams grown in Wai'āpuka. In addition, he would like to see the restoration of the native habitat, including native trees, taro, and lo'i. When Uncle Fred was asked about information on crops being traditionally grown, he recommended we follow the lead of our kūpuna in determining what crops should be grown and where. "Look at what the kūpuna were doing, where did they go, and that tells you a lot."

The cultural sites he knew about in Wai'āpuka were the Wai'āpuka tunnel, some old trails, and Kamehameha's pond. He is particularly interested in finding out how the pond was used, what exactly was that pond, and the significance of the pond.

He said when the plantations came in the land was plowed up and the water was diverted. He asked, "How much water should be diverted for the guys running fluming the ditch? What are

the water rights, who owns that water, and who can divert it?” Uncle Fred would like to see the stream restored and the tunnel be cleared of all plantation diversion, so that waters will continue to flow to its full capacity. If the tunnel is restored, he believes it will create a chain reaction to restore other cultural resources in the area. Uncle Fred believes Wai‘āpuka could set an example as an important restoration site in Kohala.



*Figure 13. Uncle Fred at Kauhola point using maps and pictures to illustrate mo‘olelo about Kohala.*

Uncle Fred admits that the land “has been abused, and used for over a hundred years to grow one commercial crop – sugar cane...” However, because the land is healing itself, the land needs restoration leadership. Although the land must be allowed to heal, it also needs people to help it along. “At least we know what our kūpuna did to help it along; they diverted water, they made the land much more productive in a way that it could be sustainable.” He believes Wai‘āpuka could be an example of how water was collected, distributed and managed by our kūpuna. With lo‘i and streams being restored, and allowing the waters to flow again, Wai‘āpuka can potentially become the breadbasket that it once was.

However, Uncle Fred believes that restoration must be an ahupua‘a effort. He explained, “It’s like redoing your house, and you just redo the kitchen but not the hall or the bedroom.” In order to restore the ahupua‘a as a whole, all the landowners need to sit down and create one master plan. With the idea of restoring Wai‘āpuka to when it was at its most productive peak, it could be used as a model of how the restoration of traditional cultural practices and resources could also have some economic value and viability. By doing this, it also restores not only the integrity of the Hawaiian engineers and mahi‘ai but also the integrity of the land. The whole relationship with man and environment to him it is not just physical restoration, but its spiritual restoration as well.

Uncle Fred shared, “If you look at Kohala’s future, it’s in its past. The best future for Kohala is studying its past, the more people learn of Kohala’s past, the more valuable it becomes for the future. Not only in terms of the Hawaiian cultural renaissance but for an economic renaissance, community renewal, and continued healing of these ancient lands.” Uncle Fred ended with, “The big question is what we are going to do these ancient lands in Kohala, and its unique cultural and natural resources?”

## Uncle David Fuertes

### *Background*

On June 6<sup>th</sup>, 2014, the group Ka‘alewaihili met with ‘Anakala David Fuertes at the Kohala Intergenerational Center in the town of Kapa‘au. The purpose of this visit was to gain understanding of the history of Kohala as well as the many struggles the people of Kohala have faced and the goals they have for the future. David Fuertes, a kama‘āina of the area for many years, provided us with a great deal of information on these topics of discussion. His passion and determination for transforming Kohala into a 50% sustainable district in 10 years, brings hope and further motivation to us, the next leaders of tomorrow.

Uncle David Fuertes was born in Kaumakani, Kaua‘i during the years of sugar plantations and left Kaua‘i after his graduation from high school. He attended Chester College in California for a short while before transferring to Chico State. He spent one semester in Chico state until he finally made his return back to Hawai‘i and attended the University of Hawai‘i. The semester after he arrived in Hawai‘i he was drafted into the military, and was sent to Germany. Soon after he returned, Uncle David used the money from his GI bill to pay for his education and earned a degree in agriculture. After that he spent another year earning his professional diploma in teaching.

When a teaching position opened in Kohala, uncle David immediately took the job because he wanted to live in a sugar plantation town that reminded him of his home town, Kaumakani. During Uncle David’s early years in Kohala, he served many positions within the community. He taught in the DOE system for over fifteen years until he was asked to work as the Deputy Managing Director in Kohala. From 1993-1995, he became a community liaison for the Department of Economic Development to revive Hamakua Sugar, which had recently shut down. After this job, he then returned to teaching. Uncle David explained how being in and out of teaching gave him insight into opportunities in community building and how everyone has a part in it.





Figure 14. David Fuertes with Ka'alewaihili sharing the story of the mural at the Kohala Intergenerational Center.

### *History of Kohala*

The beginning of our tour with Uncle David started at the Kohala Intergenerational Center. As soon as we entered the center it was difficult not to notice the mural covering the entire wall of the building. After introductions were shared, Uncle David described the importance of the mural. He described how the many children of the community gathered together and painted this mural without any guidance and were allowed to paint whatever they desired. The children of the community painted the history of Kohala, all the way up to their destiny and goals for the future.

Uncle David began with the arrival of Captain Cook to Hawai'i. Upon his arrival to Kohala, approximately 30,000 Hawaiian people greeted Captain Cook. Kohala, during that time, was completely sustainable and was able to provide enough food for all of its citizens and then some. Soon after Captain Cook's arrival, many more foreigners began to arrive to the islands of Hawai'i.

In 1793, Vancouver arrived to the Islands of Hawai'i, and brought with him an unfamiliar animal, cattle. As a gift to King Kamehameha, he presented him with seven heifers and one bull. Although most of Kamehameha's cattle died soon after they were gifted, two years later, Vancouver arrived again and presented another set of cattle to Kamehameha. These cattle were able to survive and soon began to populate areas such as Kohala. And during this time a kapu was placed on killing cattle.

In 1847, Kauikeaouli Kamehameha III lifted the kapu for killing cattle, and soon after brought in the Spanish to teach the Hawaiians how to do so. The Spanish who arrived were known as

Española's, and the respective Hawaiians who learned the skills of the Española's became known as Paniola's. 'Anakala David explains how during this time many felt that the word Paniola's was to feminine and as a result the word changed from Paniola's to Paniolo's.

When Kamehameha had lifted the kapu for killing cattle and brought the Española's to Hawai'i, he also allowed people to begin ranching. The first person who was allowed to ranch was a man named Parker. Due to the fact that he owned a musket and had some knowledge of the sort, Parker started his first three-acre ranch in the ahupua'a of Wai'āpuka in Kohala. For this reason, the paniolo's of Kohala, and more specifically the paniolo's of Waiāpuka, call themselves Kohala Cowboys and consider themselves the first cowboys of Hawai'i.

Uncle David shared that in the early 1840s, a missionary named of Bond arrived in Hawai'i and established the Christian missionary church, Kalāhikiola, in Kohala. His brother who was also a doctor accompanied him. Soon after their arrival in Kohala, the Bond's merged with a wealthy man named Wight. Together they began to farm sugar cane, which soon became the first industry in Kohala.

Uncle David explained that the first foreigners to arrive in Kohala during the sugar plantation era were the Chinese. They arrived around the 1850s and were hired for labor. They soon became an important asset in the construction of the Kohala Ditch, which ran about 27 miles upon completion in 1905. The ditch ran at a 1% grade and was able to divert 25 million gallons of water a day. Uncle David explained that during the ditches construction, over 15 people died due to the hazardous work environment.

The Japanese were the next group of people to arrive in Kohala in the year 1888. The Okinawans arrived shortly after. The main reason the Japanese were brought to Hawai'i was for their skill in cutting stone. The Chinese were not as proficient as the Japanese were in stone cutting, and this skill was required for stonewall building that was needed as the sugar industry continued to grow.

The next groups of people that came to Kohala were the Portuguese. Uncle David explained how the main reason the Portuguese were brought to Hawai'i was to become supervisors as well as laborers. In the painted mural, a stone oven, symbolic of the Portuguese cooking style, was used to represent the presence of the Portuguese in Kohala.

In 1900 Puerto Ricans arrived in Kohala and shortly after the Koreans arrived in about 1903. The Koreans were brought to Hawai'i mainly to become accountants and to handle the business aspects of the sugar plantations. Finally, in 1906 the Filipinos arrived in Hawai'i and were primarily laborers for the early sugar plantations in Kohala.

### *Palili 'o Kohala Coopertive*

Uncle David continued to explain the mural and the overall state of Kohala and its people. An important quote Uncle David shared was, "we pull together when we got to pull together." He told us of the many issues that the people of Kohala have faced over the years such as loosing access to land, drug usage, and natural disasters. But in most cases, the community pulled together to create solutions for these problems.

One specific outcome that was developed from some of these struggles was the cooperative organization, Palili 'o Kohala. The cooperative Palili 'o Kohala was developed by Uncle David and many others in the community. The goal of this cooperative is to encourage the youth of Kohala to engage in educational programs and to preserve, protect and sustain 'āina and culture. In this county, 2% of state taxes go to purchasing public lands. Uncle David described how much of that purchasing of land occurs in the district of Kohala. The people of Kohala request a great deal of land because that is what the community wants to maintain public access, have good churches and schools and to develop affordable housing.



*Figure 15. David Fuertes at Palili o Kohala sharing techniques for natural farming.*

A goal of this organization is to transform Kohala into a 50% sustainable district by the year 2018. Uncle David explained how the community of Kohala is extremely proactive in achieving this goal and is working hard to make it a reality. Uncle David described their plan in achieving this goal and referred to it as the “10 times 10 times 10,000 plan”. This plan began with 10 families given 100 huli, which produces approximately 10 more 'oha upon maturation. Kalo, depending on variety, matures in about 10 months, therefore after 10 months with 10 families and 100 huli, the production would be 10,000 kalo plants. He continued to explain that if the families gave away about half of the harvest and kept the other half to sell (5,000 kalo plants), that would be about 10,000 pounds of kalo. And with kalo selling for about six to seven dollars per pound, each family could make about \$60,000 a year. While this plan has much potential, Uncle David did admit that there have been some difficulties they've encountered, such as families not working, not being able to produce enough, and families giving away most of their harvest. However, despite some of these challenges, Uncle David remains optimistic and confident that the project will be successful.

### *Palili 'o Kohala Farm*

After our visit to the Intergenerational Center, Uncle David took us to the Palili 'o Kohala farm located in Hō'ea. At the farm Uncle described the method of natural farming they utilize to grow kalo and other plants. The main objective of natural farming is to introduce microbes and all natural fertilizers into the soil in order to produce the highest yields of crops.

The microbes they introduce into the soil are called Indigenous Microorganism 4 or IMO 4. The first step in creating IMO 4 is to produce IMO 1. Using rice that has only been cooked a little and is still dry creates IMO 1. Then the rice is left outdoors covered under shade so that it can grow mycelium without any contamination. Then it is mixed with brown sugar to help mobilize microbial action, creating IMO 2.

Then next step is to mix that with millrun and fish amino acid and ferment for six months in a five-gallon bucket. That mixed with calcium phosphates from eggshells and animal bones everyday for 4 to 5 days will create IMO 3. IMO 3 is then mixed with soil in a one to one ratio to create IMO 4. IMO 4 is introduced into the soil by first using a spade to create pockets in the soil then adding a little and covering up the hole. These microorganisms in the soil begin to attract worms into the area and the worms aid in introducing extra nitrogen into the soil and in aerating the soil. Uncle David does this one time and then plants his kalo. He also explained how sea salt/water can be used to lower the acidity level in soils creating a more alkaline soil which is preferred by the microbes.

Besides growing all natural organic crops, Uncle David also raises livestock such as chicken, pigs and cattle. He uses a natural method to feed this livestock by ferment rice water for two to three days, mixing it with milk to ferment, and then the end result is a cottage cheese like substance that they use to feed the pigs and chickens. This type of livestock feed is very healthy for them and aids in their growth.

Uncle David also shared about growing crops in Kohala Iloko. He mentioned that the hardest challenge for farmers is getting good agricultural land, with clean flowing water. Another difficulty is acquiring capital. He mentioned how land in gulches is not the only place that is possible for agriculture because of its easy access to water, but that the upper lands of Kohala Iloko are also viable because there have been crops grown in these areas there for centuries. These uplands crops are able to receive more sunlight that results in stronger and quicker growing plants. Uncle David explained how the land of Kohala, especially in the area of Wai'āpuka, has high potentiality and that with the combined action of the community, Kohala will be able to reach its goal of 50% sustainable in ten years.

### *Wai'āpuka Ahupua'a*

Regarding access to Wai'āpuka, Uncle David stated that if the place is managed properly and a structure is created where the people come with similar beliefs and values, and if there is a strong foundation of trust between the owner and the community, then public access should be allowed. When asked about cultural sites in Wai'āpuka, Uncle David shared that he does not have too much knowledge sites there, due to the fact that they do not have access those lands.



This seems to be a big problem throughout the entire community, however it does seem that the community has interest in these cultural sites.

When asked about the difficulties associated with restoring, working at, and maintaining, traditional sites, 'Anakala David emphasized a concept he calls the three QP's. The three QP's are – Quality Program, relating to the quality of the idea that is going to be implemented; Quality People, relating to those who intend on making the program happen; and lastly, Quality Partnership, between the local community, land owners, and or people outside of the community. He explained that all three are necessary in order to make something happen. When one of these is not working well, then the goal cannot be obtained. Without a well thought out quality program, the project does not have a strong foundation. Without quality people, the project or program will not be completed well. And lastly, without quality partnerships there is no connection and no supporting factors to the program. He also stated that it takes people that have compassion to develop and sustain programs. Lastly he shared that it takes time and that projects, such as lo'i restoration, cannot be rushed.

When asked if there are particular places in Wai'āpuka that stood out as being the most important for restoration, Uncle David stated that they would be places located near constant running streams. These are the lands on the upper kula lands and in the gulches. He also stated that the sites located near the Kohala ditch may have the best potential for restoration. He shared that the areas where our work was concentrated, and more makai are sites where he would like to see restored. He would like to see crops such as kalo growing there, as well as ranching of cattle. Uncle David also suggested to grow trees for windbreaks, and then these trees can be harvested in twenty years for wood and other uses.

Uncle David is very supportive of having not only the Kohala community be a part of restoration projects in Kohala, but that it should be open to everything that has the desire and right intentions. He said that if people have the passion to do it, then it should be open to them. He also stated that a lot of the time, locals believe that only they can do it, but if an outsider has the same beliefs and values of wanting to kōkua, then they should be able to. With the idea of respect for culture, the 'āina, and everything else that goes around it.

One of the main suggestions Uncle David made regarding the restoration and reuse process for Wai'āpuka is to start small. He explained that in order to make a big project happen, first those trying to restore must start with just a small section of land. A second suggestion was to create natural windbreaks by growing native plants and trees, ones that can be used for their wood or other purposes. A third suggestion was to create mulch from the many invasive alien species, and use them for natural farming and to create compost.

When asked, what do you envision for Wai'āpuka, Uncle David said, “to see the restoration of kalo and the diversification of other agricultural crops.” He believes that diversification of agricultural activities would aid in complementing the growth of one another. This diversification could be in crops, animals, and forestry. His last remark was that we need to look at how that specific plan can be sustainable by itself, for that is the true goal of Kohala.

## Uncle Mike Gomes

### *Background:*

On June 16, 2014, Ka‘alewaihili members Deandra Castro and Melissa Tavares visited Uncle Mike Gomes at his pineapple stand located on the front of his property along the highway in Niuli‘i. We introduced ourselves as UH students and let Uncle Mike and his wife Aunty June know what we were researching in Waiāpuka and the reason we were interested in interviewing him about Kohala.



*Figure 16. Mike and June Gomes in front of their Pineapple stand.*

Uncle Mike Gomes was born on O‘ahu although his earliest ancestors arrived in Kohala in 1882. His ‘ohana’s name was Luiz that was later changed to Luis. Uncle Mike’s grandmother (paternal) was born in Mahukona and then married his grandfather who, unfortunately he never to meet. His grandmother was of Portuguese (maternal) and German (paternal) ancestry. Her ‘ohana’s family name is Born. His grandmother and great-grandmother arrived in Kohala aboard the ship *Hanza* to work at the sugar plantations. His grandmother was just a child at the time she arrived and Uncle Mike explained that his Portuguese lineage came from Azores and Madeira.

Uncle Mike’s great-grandfather worked on the Niuli‘i plantation in Kohala then moved to Kona to work on another plantation. This is why his father was born in Hōlualoa, Kona. His grandfather (who he didn’t know) died in his forties from a disease called “sleeping sickness” which Uncle Mike explained you can contract from a fly. Uncle Mike shared that his grandfather

couldn't read or write but that his grandmother and all her sisters were school teachers and taught in the Kohala community.

A few years later, when Uncle Mike's grandfather passed away, his grandmother and his father moved to O'ahu where his father attended St. Louis and went to college at the age of 16 to study engineering. After attaining his degree, he returned to O'ahu and worked as an engineer at Pearl Harbor. After WWII, his father went on to work for the Hawai'i Sugar Planters Association as a trainee, and was eventually offered a job in Kohala.

In 1949, when Uncle Mike was two months old, his 'ohana moved to Kohala into a small house in Niuli'i that is still standing today. He referred to the place as the Botter's residence, which was the old manager's house. Uncle Mike doesn't remember how old he was then, but he has fond memories of growing up in the area and playing as a little kid.

When Uncle Mike was nine years old, his 'ohana moved to Hala'ula from Niuli'i to attend Hala'ula elementary where there was one assigned teacher per grade. His father valued their education and decided that the best solution was to move them to the school he liked, so they relocated Hala'ula.

Uncle Mike explained that this was the reason why his family isn't living on the Niuli'i property today and that Castle and Cooke sold off most of their properties they previously had. Their house in Hala'ula was near the sugar mill and eventually the company built a brand new house for his 'ohana because Uncle Mike's father was like "an upcoming star." Around 1963-64, the sugar company built Uncle Mike's family a house above Hāwī and they relocated again.

Uncle Mike shared that he has enjoyed farming from a young age, when he used to grow Mānoa lettuce, carrots and corn. His first job was for cleaning yards for twenty-five cents an hour. After high school, he attended college and when he finished school, he returned to Kohala to farm and he even started his own watercress farm operation.

### *Surety Inc.*

Although, he has always been involved with Kohala where he sat as the community association president for almost a decade (from the 1970-80's).

Prior to working for Surety, Uncle Mike worked for the Mauna Lani Resort for thirteen years. During this time, his involvement in the community dwindled because he spent so much time at work and only got to spend a limited amount of time in Kohala on the weekends.

When Surety offered Uncle Mike a job, he knew that he loved Kohala more than the Mauna Lani; and by coming back to Kohala he could be a positive influence in the community. He saw how Surety worked with the community in developing the 'Āinakea subdivision and he was hopeful that more responsible development projects could be planned for Kohala.

In 1990 Uncle Mike became the Project Manager for Surety in Mahukona. During his time working for Surety he received additional duties and became a Land Manager and the Vice President, which dealt with real estate state sales, leases, the Kohala Ditch, the ranch, and public relations.

## *Waiāpuka*

According to Uncle Mike, Surety owns the portion of land below the highway in Waiāpuka, and Kamehameha Schools (KS) owns the land makai of that. Uncle Mike stated that until 1948, KS only had about half of the land that they own in Waiāpuka today, and that the sugar plantations did a land swap with KS where they were able to accumulate the sixty acres they own in Waiāpuka today.

## *Cultural Sites in Makanikahio and Waiāpuka*

Uncle Mike shared that on Pu‘u Kīlauea, which is in Makanikahio and is not on KS land, that he has written evidence from a surveyor that interviewed a kama‘āina that worked for Kohala Sugar Plantation in 1938 in relation to land cornering his property. The kama‘āina, named Kalai Mersberg, stated that there were seven to nine burials on the mountain in an area that was formerly a house site. It is important to note that Uncle Mike stated that the last name Mersberg is German, but that Niuli‘i was different from other places in Kohala, as many Germans came to the Niuli‘i plantation and married Hawaiians. Uncle Mike expressed that some people believe these the structures represent something else, but he stated that these people have no basis to back up this argument.

Uncle Mike also shared that there is a pu‘u that has caved in it with an arched top and sides dug out in straight edges. While investigating this feature, he dug a portion of the cave and inadvertently uncovered iwi kupuna. The area turned out to be an old crypt, so he reentered the iwi and restored the cap to protect the area. He recommended to Surety to bury the crypt, but unfortunately, that hasn’t happened yet. Uncle Mike also shared that there may be a few spring-fed lo‘i in Waiāpuka that may not have been identified or documented yet. He also mentioned that he has come across iwi kupuna in some bluffs on the makai side of Waiāpuka and that Sonny Solomon told him it was iwi kupuna from Pololū.

## *Restoration*

Uncle Mike has “contrary thinking” towards restoration efforts in Waiāpuka. Some questions he raised is, “what is the purpose we have towards restoring a specific site; if we want to restore a site for a specific reason; and do you want to restore a general site that has the resources necessary to possibly sustain a local economy?” He also questioned if “we are looking for something unique to restore, or looking for something that will produce an end result?” He expressed that there are important criteria that need to be taken into consideration such as: transporting water upland, land ownership, and what is currently growing on the property.

Uncle Mike also asked if the restoration “will be economically successful because the sustainability programs offered are dependent on funds from others.” He stressed that there needs to be an economic element to the plan because that is the way Hawaiians did it; whether it be taxes on produce or labor, or trade and bartering that was popular too. His thoughts are that capitalism has been the most successful form of a system because it has fed more people on this planet than anything with the concept that “farmers grow things and sell them.” He says subsistence farming doesn’t work.

Uncle Mike explained the concept of what an ahupua‘a is and how humans have done everything to work against the system (laterally). He gave examples of the city road cutting across the ahupua‘a, the Kohala ditch, the railroad, barges from Hilo to Honolulu. Uncle Mike expressed, “Is there a way to mix those things? Because we have modern life or are we just trying to restore things back to some very old style where the average age of death of a Hawaiian was thirty years of age?” He spoke about how life was hard in ancient times, and described the people as thin, muscular, and hard working. But at the same time, Hawaiians of the past had flourishing population, the ability to have a religious order, community building projects, warriors, and farmers and fishermen to support the people of Kohala. Uncle Mike cautioned that these are some issues to take into consideration when thinking about the restoration of Wai‘āpuka.

As far as existing features in Wai‘āpuka, Uncle Mike believes that they still exist today because none of it can be recreated. All that hadn’t been bulldozed and cultivated for sugarcane at least. He remembers features in the stream and the sugarcane fields when he was a child. Growing up, he would go to “Loke’s Place” located near the old plantation camp, lo‘i and cemetery.

When Uncle Mike was Land Manager at Surety, he made sure to accommodate any families that wanted to restore lo‘i systems and get back on the ‘āina. However, he also expressed some of the challenges such as projects dying out because of family members having pilikia with one another, funding running out and the interest levels waning. He suggested that cattle ranching would be ideal in Kohala because both the wet and dry sides could maximize the resources of the area. He believes in divisions of labor to enable society to function. He suggested that the Hawaiian culture is a product of old practices that still exist today and that we should incorporate concepts from the past today to create a successful plan. According to Uncle Mike, “an action plan is important, because we need to get the Kohala community interested in how the restoration plan will benefit the people as a whole.”

## Kehau Marshall

### *Ulu Mau Puanui*

As part of the Kohala I Ka Unupa‘a field course, we went to the leeward Kohala field system (LKFS) in the ahupua‘a of Puanui on June 10, 2014. Kehau Marshall, the director of the non-profit, Ulu Mau Puanui, led us in a day of learning about the function of the dryland field system on the slopes of the Kohala Mountain. She shared her mana‘o with us about Puanui and the challenges of running a non-profit organization and working with the community.

We started the day with hiking up Pu‘u Kehena, which gave us a good vantage point to view the extensive landscape of ancient field walls. Kehau explained that radiocarbon dates from the field system indicates that cultivation may have started as early as 1290, but most likely wasn’t an extensive field system until later. The field walls were dated between the early 1400s to after 1660 (Ladefoged & Graves) and served as a nursery for producing the Hawaiian sweet potato, ‘uala. Kehau told us that at first, the field system was slowly developed and ten acre plots were cleared. During the time of Lonoikamakahiki, the field system rapidly developed. Something happened politically and/or socially that caused a great demand for food production. But around 1848, the LKFS was largely abandoned, possibly due to a social and/or political change. This abandonment of the LKFS was probably due to the drastic drop in population numbers due to the introduction of diseases by foreigners that Hawaiians had no immunity to.



Figure 17. Kehau Marshall at the top of Pu‘u Kehena sharing mo‘olelo about the Kohala dryland field system.

### *Puanui’s Landscape*

The LKFS was one of the biggest, most intensive, and most productive pre-contact rain-fed (dryland) agricultural systems in the Hawaiian Islands (Ladefoged & Graves 2010). When Dr. Patrick Kirch was conducting archaeological investigations at Lapakahi Park, he realized that the field system was much more extensive than what he presumed. This then led to more multi-disciplinary research being conducted on the different aspects of the field system with scholars including Peter Vitousek, Michael Graves, and Sam Gon III.

### *Ahupua‘a boundary*

The ahupua‘a of Puanui borders Puali‘i (or Pua‘ili or Pua‘iki depending on the map) to the south and Kehena to the north. Currently, a fence separates the two ahupua‘a. Kehau told us that kō, ‘uala, and kalo were farmed in the Puali‘i ahupua‘a near the Puanui Mala, and that below, there would have been a staggered row of sugar cane and another row of ‘uala. Looking towards Puanui makai, the vegetation dramatically changes from green to brown, and Kehau explained that this where the field system ended.

### *Pu‘u Kehena*

While on Pu‘u Kehena, it was obvious that the winds were drastically stronger. Ironwood was planted on the top of the pu‘u to slow the wind down. Kehau showed us a ko‘i that she recently discovered while climbing the pu‘u. She credits Kelley Uyeoka for pointing out basalt flakes on



the pu‘u the year before, as her eyes were more ma‘a to recognizing the different shaped stones. Kehau told us that the two major adze quarries where basalt rocks were gathered was at Mauna Kea and in the Kohala Mountain, above Pololū. Basalt rock was used to make adze and other cutting and digging tools and were transported long distances across the island.

### *Natural Resources*

Kehau shared that before the field system was constructed, there was a native forest from mauka to makai, which included wiliwili (*Erythrina sandwicensis*), hala (*Pandanus tectorius*), ‘ōhi‘a (*Metrosideros polymorpha*), kokio (*Hibiscus kokio*), lama (*Diospyros sandwicensis*), uhiuhi (*Caesalpinia kavaiensis*), koai‘a (*Acacia koaia*), olopua (*Nestegis sandwicensis*), pāpala (*Charpentiera obovata*), hō‘awa (*Pittosporum hosmeri*), and ‘ohe makai (*Reynoldsia sandwicensis*). To prepare the land for cultivation, a common technique called slash-and-burn (or shifting cultivation), was used to clear the land. Unfortunately, this also meant that the native forest was destroyed. Today’s landscape is dominated by kikuyu grass with sporadic ironwood, pine trees, and Christmas berry.

Due to the location of Puanui being on the leeward side, water resources are very limited. There are no streams in this area, so the only water available is from rain and fog drip. There are also very strong winds that usually come from the ‘Alenuihāhā channel (north east). On the day of huaka‘i, the winds were abnormal as they were coming from a different direction, they weren’t as strong as normal, and the ocean was like a lake. Kehau advised us to be extra careful that day as we ascended and descended the pu‘u.

### *Puanui Mala & Planting Techniques*

Unfortunately, there is not much documented about the LKFS. Kehau believes this is due to the inhabitants leaving the area for a variety of reasons and not passing on the stories of the place. The only evidence that still exists are the field walls themselves. These walls run parallel to the shoreline, unlike the field system in Kona. In Kohala, each row was less than 5 feet from the next row.

Ulu Mau Puanui currently has three working mala. On the day of our visit, we worked in the mauka mala to clear kikuyu grass and other weeds so that the ‘uala could get as much sunlight and water as possible. Kehau explained that the ‘uala was planted on a raised row and kō was planted in a staggered pattern to slow the wind, and therefore the rain clouds, so that more water could be captured. According to Kehau, the wind blowing the sugarcane leaves act like a sprinkler, and sprinkles the water onto the ‘uala. ‘Uala matures in 4-6 months, which is a lot shorter than kalo, and is also more tolerant to the harsher weather conditions of leeward Kohala, so it was a better fit considering the climate conditions. Traditional farming tools that were used were digging sticks called ‘ō‘ō.



*Figure 18. Ka‘alewaihili weeding the kō in the māla at Puanui.*

### *Education Programs*

Ulu Mau Puanui’s focus is to educate the community about the LKFS. Kehau was previously a teacher at Kanu o Ka ‘Āina and her preferred teaching style is multi-age because it’s more natural. She said it was easier to work with the kids that way as far as sharing knowledge and facing fears. This program aligns with her place-based teaching style. Another reason why Puanui is special to Kehau is that her family lived on the land above Pu‘u Kehena, so she has an ancestral connection to this place.

### *Recommendations*

Kehau shared the following mana‘o that was very insightful, “The more we learn about how our ancestors worked the land, how they used the resources, where they got their resources from, hopefully will lend to how we can maintain sustainability, self-sustenance, and food security.”

Kehau also explained that weather patterns are important to observe in a restoration area because that is how you’ll know when to plant and harvest. “Our ancestors knew when the rains were coming and when it was going to be drier than usual.” To better understand the current weather patterns at Puanui, they have installed five weather stations.

Kehau shared that another restoration challenge they had was that there was no historical account of the methods they used for the restoration at Puanui, so it turned into a little bit of an experiment. For example, after Ulu Mau Puanui planted on the existing mounds in the mala,



they discovered that the spacing they had used between the ‘uala and the kō needed to be adjusted.

Like many non-profit organizations, the most challenging parts about running an organization are finding funding sources and volunteers. Currently, funding comes from Kamehameha Schools (KS). While Ulu Mau Puanui greatly appreciates the funding, there is a need for more full-time positions so that responsibilities, like accounting, can be streamlined and the organization itself and the amount of area that is being restored can increase. A full-time labor position would also be beneficial. Kehau noted that volunteer groups are sporadic and it’s difficult to find people to come to work on a regular basis. “Finding people that are connected to the land and genuinely care about the place is important.” Also, since KS is funding this project, and they emphasize place-based learning for their students, Kehau suggested that it would be great to see the faculty and staff of KS experience Puanui for leadership and professional development opportunities.

Future goals of the program are to build a structure so that when the weather is bad, there’s an indoor classroom to teach at. They also hope to build a composting toilet to make things easier for kūpuna when they visit.



*Figure 19. Ka‘alewaihili with Ulu Mau Puanui staff*

Aunty Daisy Luhia Naihe

*Mo‘okū‘auhau*

‘O Pilipi Muli ke kāne, ‘O Lilia Kapeliala ka wahine. Noho pū lāua a hānau ‘o Hune Kaho‘omana Phillip, he kāne. No Kohala.

‘O Harry Haleia Kealaka‘a ke kāne, ‘o Keola Paki‘ai ka wahine. Noho pū lāua a hānau ‘o Rosilia Lono Haleia, he wahine. No Kohala.

‘O Hune Kaho‘omana Phillip ke kāne, ‘o Rosilia Lono Haleia ka wahine. Noho pū lāua a hānau ‘o Daisy Luhia Phillip, he wahine. ‘O Wai‘āpuka kona ‘āina kulāiwi.

Aunty Daisy Luhia Naihe was born on May 22, 1934. She was the 11<sup>th</sup> child of the sixteen children raised by Hune and Rosilia Phillip of Wai‘āpuka. There were nine girls and seven boys, with one boy being a hānai child. The first ten of her siblings were born in Wai‘āpuka, Honomaka‘u, Niuli‘i and Makapala. Their father delivered four of her preceding siblings in their home, and the other six were delivered by a mid-wife with the help of their father and older sisters. As times began to change, Aunty Daisy was the first to be born at Kapa‘au Hospital rather than at their family home.

Aunty Daisy’s father served in the military for ten months on the island of O‘ahu. The officers had a difficult time pronouncing his name. They asked him to change Pilipi, and from there he became known as Hune Phillip. Hune was a Hawaiian, Japanese man that Aunty Daisy greatly admired because he was a hard-working man that never fell short of providing for his family. He was a plantation worker that worked in the cane fields from Niuli‘i to Hala‘ula, first planting cane by hand and then later driving the cane trucks. Aunty Daisy said their property was surrounded by sugarcane, and sometimes they’d ride in the truck with the workers or swing from the hanging cane. One of Aunty Daisy’s fondest memories of her father was when he would go down to Pololū to catch turtle and shoot wild ducks for them to eat. She also remembers she and her siblings would go down and gather lauhala and make bundles of 100 and sell them for one cent a piece. Her father always provided for their family and “they never went hungry” because he was such a hard worker.

Aunty Daisy’s mother was a Hawaiian, Caucasian woman named Rosalia Lono Haleia. Rosalia and her eldest daughters would do laundry for the soldiers at port and the people in the plantation camps. They would wash the clothes in the gulch and bring it back to the washhouse to rinse. Aunty Daisy talked about what hard work it was to wash laundry because everything was ironed and starched back in those days and the starch had to be boiled first. Aunty Daisy also talked about her mother’s flower gardens where she grew African daisies, tuberose, and gardenias. She fondly remembers how her mother always had flowers in her hair after working in her garden.

### *Growing Up In Wai‘āpuka*

The Phillip family lived in upper Wai‘āpuka. The sixteen children and their two parents lived comfortably in a ranch style home with three large bedrooms. Their driveway led to the cookhouse, followed by their home and the fudo (a washroom behind the house). The concrete foundation of the fudo can still be seen today. Their home had a long lanai in the back overlooking the riverbank where a mango tree grew that they would pick buckets full of mango everyday during mango season. They grew a lot of their own food. On the slopes above their home were taro patches and vegetable gardens where they would grow things like string beans. They also had cattle. There were always four to six cows that they would milk and that her father would sometimes butcher for meat. Her father was an inventive man that ran metal pipes from the stream to their home so that they could have running water in their kitchen, bath

house, and also their taro patches below their home. Remnants of the metal piping can still be seen today.

### *Family Taro Patches*

There were ten taro patches terraced below the house and Aunty Daisy said that each child was responsible for their own taro patch. They worked in their taro patch everyday during the summer and even after school during the school year. She remembers it being of no fun, but they never dared rebel. She and her siblings would try and help each other but sometimes one would get lazy and in the end result in a mud fight. From there they would go down to the gulch and rinse off. Her father built the rocks walls surrounding the taro patches and he and his sons dug ditches that ran in a system from the stream to their taro patches. Aunty Daisy said that the ditches were just dirt at first with a limu that would grow on the bottom of the 'auwai, and that's how the water stayed clean. Then they later installed metal piping to run through the taro patches. Aunty Daisy said they "*lived on poi, just taro.*" They would rotate the patches they harvested from and always had plenty to go around. Her father was branch president of their church and always had guests, she said he was a very giving man. Their taro patches did not only provide for the family, but also the community.

### *Moving From Wai'āpuka to Niuli'i*

As the sixteen children grew older and went on to start their own families, their father built a house in Niuli'i. It was a lot of work to maintain the taro patches and vegetable gardens they had in Wai'āpuka, and with the children leaving, it got even harder for her father. The family relocated to Niuli'i while Aunty Daisy was in high school, around the year 1949. She still has family that resides there including her two sisters and her nephew.

In 1952, Aunty Daisy married Uncle Robert Naihe, who is also from Wai'āpuka, right after high school. Together they have seven children and currently reside in Pana'ewa, Hilo, Hawai'i.

### *Concerns Regarding Family Access to Wai'āpuka*

When asked if she had any concerns regarding Wai'āpuka, Aunty Daisy said that restricted access to Wai'āpuka has been a problem in the past and continues to be a nuisance for her family. Close to her family's taro patches in Wai'āpuka are her family graves. There are about six plots there, including her family as well as her husbands. Their family tries to go to this gravesite once a year to maintain the site. When they want to gain access in to the area they call Surety office in advance to let them know they will be going up to the graves. Although they've obtained access to enter Wai'āpuka in the past, it is a frustrating and inconvenient process to go through.

## *Restoration of Wai‘āpuka*

When asked if there are certain sites in Wai‘āpuka that she would like to see restored, Aunty Daisy spoke of the gravesite of her grandmother, Keola, and brother, Harry. In Hawai‘i, there are many gravesites with unmarked graves, but there are still families that know who’d buried in specific areas. Her grandmother and brother are buried in a little gravesite near the old Catholic church property. They have no headstones, but Aunty Daisy can still point out where the plots are. The owner of the property currently protects them from cattle with a fence, but the grass has grown high since the last time Aunty Daisy was there. She would like to see this area restored so that these graves are not forgotten.

When asked about possible restoration of the taro patches she and her siblings once took care of Aunty Daisy thought it was a great idea. The excitement and energy she had voiced her desire for restoration of the place she once called her playground and home. When asked if she wanted to see a specific group or family take care of the area, she said that it would be nice for the people who have roots in Kohala to get back on the land but she is open to anyone willing to take care of the area. Aunty Daisy shared:

If anyone is willing to go there, mālama the area and grow the taro, of course, it’s a good project. You’ve got to kind of keep to what the old people went through, got to bring back those things. And if anyone is willing to build up that place, that is a possibility.

Aunty Daisy is one of only a few kūpuna who once lived in Wai‘āpuka that are still alive today. She holds fond memories there with her family of days working in their taro patches to making their own play things. The Phillip family is a wonderful example of how Hawaiian’s lived off the land and created a sustainable environment that not only fed their family, but also others in the community. It is important to Aunty Daisy that her family has access to the sites where their loved ones are buried, and if possible, to restore the area so the sites are not lost. She would also love to see the taro patches she once tended to be restored, and believes that this project could definitely be accomplished in the future.

## *Aunty Nani Hussey-Svendsen*

### *Background*

Ka‘alewaihili first met Aunty Nani Hussey-Svendsen at the guesthouses we were renting from her during the summer in Niuli‘i. We were fortunate enough to have multiple interactions with Aunty Nani to get to know her better and for her to get to know us as well. As Ka‘alewaihili conducted an interview with aunty Nani over two days on June 13 and 14, 2014, we were able to make close connections with her and she was gracious enough to share multiple intimate stories with us. Some of these stories included recollections of her childhood and the journey which brought her to establish Kukui Lo‘i, a welcoming place of refuge for all people, especially the Kohala community. It is a safe haven for individuals to reconnect and heal the land, and in turn, people find themselves being healed. Aunty Nani shared that being on the land allows all five senses to be activated which allows a faster connection to spirit which in turn guides people to remember they are made up of mind, body, and spirit. Connecting all three parts is how people

live a healthy life. Kukui Lo'i is a place where only positive energy is welcome and magical occurrences happen daily.



*Figure 20. Auntie Nani Svendsen at Kukui Lo'i.*

### *Childhood Memories in Wai'āpuka*

Auntie Nani was born above the Wai'āpuka Ditch #5 in 1955. She was raised there until she was eleven years old. Her father, William Duddy-Hussey, worked for the Kohala ditch company, which required the family to live on property to properly maintain the ditch. It was work that was 24 hours a day, seven days a week, but as Auntie Nani remembers it as the, “most beautiful time of my life.” Her mother and five other siblings, all helped with the maintenance of the trails and lo'i patches.

Auntie Nani shared the following about the work she and her family partook in at Wai'āpuka:

From a young age us kids were give two sickles and a section of trail that we all took care of. The sickles became extensions of our hands and we would cut the grass and move all the stones so that my father could come in after with the mower. My father taught us never to be afraid of work and it was never thought as hard labor. After the work was finished for the day the kids would adventure through the uplands of Wai'āpuka. The land provided all the family needed to survive as well as resources for the rest of the community.

Since Auntie Nani's family lived in the mountains and the rest of the community lived in town, they were often asked to gather ho'i'o, mountain opae, maile, and other resources that grew up mauka. When they would gather, sometimes they would harvest from six am to six pm and would fill a five-gallon bucket of mountain opae for parties that fed 300 to 600 people. The family also grew kalo in their lo'i and had various gardens and fruit trees. On their property, her



family raised chickens, ducks, and hunting dogs. They also caught and raised wild pigs for food later.

At age eleven, Aunty Nani's family moved to another property they had in Niuli'i because her mother got a job with the plantation. It was more convenient for her mother to catch the plantation work truck to the plantation at their house in Niuli'i. However, Aunty Nani always craved to go back to Wai'āpuka. When Aunty Nani was twenty-one years old, she remembers that the cattle ranching leaseholders built gates to keep the cattle in but adversely, it blocked public access for both the community and her family. When families went up to gather food they would all carry a machete with them and it was everyone's kuleana to clear the sides of the kahawai. When the gates blocked access one of the consequences was the roots of the trees along the kahawai would become overgrown and enter the streams creating blockages. This in turn affected the community downstream because the water in Waiakama stream drains into two streams in the lower community. The wild pig and live stock populations also increased because the hunters had a harder time being able to maintain the pig and wild cattle population. Up mauka in Wai'āpuka, there are wild pigs and livestock that the community hunted which helped maintain the wild populations and in turn it fed their families.

### *Kuku'i Lo'i*

Not being able to go to Wai'āpuka as freely anymore, Aunty Nani had a void that nothing else but that connection to a specific place could fill. She came to buy Kuku'i Lo'i from her elder brother which had been in the Hussey family for seven generations. Aunty Nani requests that people only come willingly and with positive energy. Protecting the sacred space of Kuku'i Lo'i allows for magical occurrences happen often.



*Figure 21. Aunty Nani sharing stories with Ka'alewaihili in her newly restored pond.*

Kuku‘i Lo‘i is a place where people come to fix things with in themselves and to emotionally heal. Messages come through other people of how to go about helping others heal themselves. One message was that Aunty Nani had to bring ocean salt from each of the Hawaiian Islands to mix with the water from Kuku‘i to make water that could help with emotional healing. Aunty Nani was confused at first because she was not sure how she would get salt from Ni‘ihau and Kaho‘olawe. However, eight months she got a request to use Kuku‘i Lo‘i as a campground for a charter school alliance for kids from all the Hawaiian Islands. Each child brought salt as makana from their home islands so Aunty Nani was able to have the salt ceremony. From this experience, she came to understand that if you think it, and your intentions are right, then things will fall into place.

### *Restoration Recommendations*

Aunty Nani’s recommendations for Wai‘āpuka are that a Hawaiian organization be created to restore Hawaiian cultural activities there. The environment in Wai‘āpuka always has cool flowing water so it should be used to grow kalo in lo‘i. Aunty Nani shared there should be other Hawaiian plants grown there such as ‘awapuhi, ho‘i‘o, and hapu‘u. But most importantly, it should be people that are grown there. Growing people means that they can reconnect with themselves and their roots. Many people today are lost and everyone has something they have to recover from. Therefore, Aunty Nani acknowledges that they need a place where they can heal and reconnect to a higher power. Aunty Nani shared that the higher power guides people by telling them, love yourself, love each other, and do good.

Aunty Nani explained that Kukui Lo‘i is run on trust, and to have trust means to have have faith in all things. One thing that Aunty Nani has faith in is that people are going to do the right thing. Aunty Nani explained that when you expect the best of people, very seldom do people fail you. People want to live up to your expectations. Aunty Nani works with the men from the therapeutic living home for people in recovery from drug and alcohol addictions. Kukui Lo‘i is their spirit school, where they are able to find healing in themselves while they worked to restore the land. Aunty Nani finds their strengths and then uses them to help build up Kuku‘i Lo‘i as a place for all people to come and enjoy.

Aunty Nani’s mana‘o regarding land restoration comes from a perspective that the people doing the restoration should have a strong desire to restore. It comes from a cultural understanding that land is your identity and so restoring it turns into a matter of life and death. Aunty Nani explained this further by stating, “Life or death because if you believe that we came from the land and that the land provides the food that feeds every part of a person; their mind, body, and soul. If there is no land then one cannot be fed. The land provides nutritious food that feeds families and communities for generations to come.”

Aunty Nani believes that restoring land it is not just for one individual to benefit from, but for communities and generations to benefit. For Aunty, that is the drive that instills commitment and dedication to land restoration projects that take years to start up and decades to sustain.

It has taken Aunty Nani over thirteen years to transform Kukui Lo‘i from an over grown “waste land” into the thriving ‘āina momona it is today. Restoration of Kukui Lo‘i is not Aunty Nani’s full time job, but she continues to work on her garden when she can, even if it’s just a couple hours on the weekends. And the over the years, more and more people have come to help her.

Aunty Nani concluded by sharing, “If we believe that we came from the earth and that is where we will go when we die, then why would you not have a deep connection with such a sacred place. In the story of Adam and Eve, the plants were made before man. God put them a garden. It was the best place for them to live. Everything we need is in that garden. Why is that not important today?”



## APPENDIX E – COMMUNITY QUESTIONNAIRE

Questions
Q1 How important is it for Hawaiian culture to actively be practiced in today's world?
Q2 How important is access to land and resources in perpetuating Hawaiian culture?
Q3 How important is the Kohala community to you?
Q4 How strong is the community connection currently in Kohala?
Q5 How important is it that your descendants continue to live in Kohala?
Q6 How important is the restoration of cultural sites to you?
Q7 If a cultural restoration program were to be developed in Kohala, how interested would you be in participating in it?
Q8 How much do you support the idea of Kohala district becoming 50% sustainable in 10 years?
Q9 How great is your desire to return to cultivating crops that were traditionally grown in the area?
Q10 If you had the opportunity to cultivate a portion of traditional farmland to feed your family and the community, how likely would you be to work it?

Figure 22. Questions on community questionnaire.

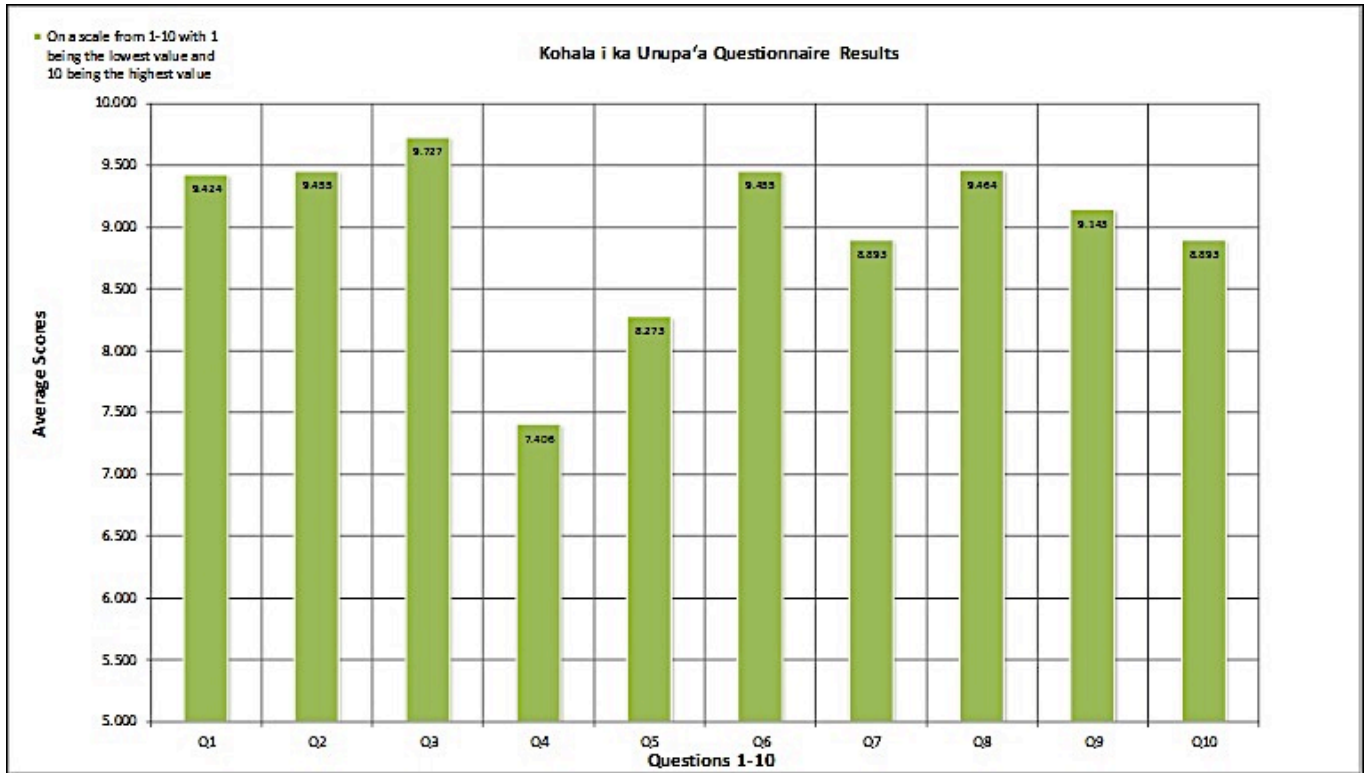


Figure 23. Graph representing participant answers to community questionnaire.

## APPENDIX F – CONDITION ASSESSMENT FORM

<p><b>Kohala I Ka Unupa‘a</b></p> <p><b>Archaeological Condition Assessment Form</b></p> <p>Name of Recorder: _____ Date of Recording: _____</p>		
<p><b>Project Name:</b> Kohala I Ka Unupa‘a</p>	<p><b>Project No.:</b></p>	<p><b>Site Number: Waiāpuka 2</b></p>
<p><b>Other Names:</b></p>	<p><b>Is this a New Site (Yes/No)?</b></p>	<p><b>Previously Mapped by HARP 2008 (Yes/No)?</b></p>
<p><b>For Previously Mapped Sites, Were New Features Identified and Added to Map? (Yes/No)? If Yes, Briefly Describe:</b></p>		
<p><b>Geomorphological Setting and Vegetation:</b></p>		
<p><b>Specific Potential Human Hazards/ Safety Concerns:</b></p>		
<p><b>Specific Stability/ Damage Concerns to Site/Feature Stability:</b></p>		
<p><b>Context Integrity- value of surrounding environment and whether it adds or takes away from the site (ie other sites, native plants, noted places, historical information, etc).</b></p>		
<p><b>Describe the Physical Condition – its “intactness” in regards to its ability to serve its intended function (make sure its in line with the site/feature description and also color code the map)</b></p>		



## APPENDIX G - FIELDWORK PHOTOS



*Figure 24. Kalo growing on west wall in WAI-2-S view to WSW.*



*Figure 25. Eastern berm of feature WAI-2-S, view to E.*





*Figure 26. Concrete and stone Po'owai located South of WAI-2-S, view to SE.*



*Figure 27. Portion of southeast retaining wall in feature WAI-2-T, view to SE.*





*Figure 28. Possible northwest retaining wall of feature WAI-2-T adjacent to Waikama Stream, view to ESE.*



*Figure 29. Northeast face of Northeast berm of feature WAI-2-U, view to S.*





*Figure 30. Southeast wall in feature WAI-2-V, view to E.*



*Figure 31. South wall in Feature WAI-2-W, view to S.*





*Figure 32. East retaining wall of feature WAI-2-X, view to W.*



*Figure 33. Boulders along southern boundary in feature WAI-2-X, view to SW.*





*Figure 34. South retaining wall of feature WAI-4W-Y, view to S.*



*Figure 35. Eastern retaining wall in feature WAI-4W-Y, view to E.*





*Figure 36. West retaining wall of feature WAI-4-W-Y, view to W.*



*Figure 37. South retaining wall of feature WAI-4W-AA, view to S.*





*Figure 38. North retaining wall of feature WAI-4W-AB, view to S.*



*Figure 39. East retaining wall of feature WAI-4W-AC, view to E.*





*Figure 40. South retaining wall of feature WAI-4W-AD, view to S.*



*Figure 41. South retaining wall in excellent condition in feature WAI-2-L, view to S.*





*Figure 42. Vegetation overgrowth present in West retaining wall in feature WAI-2-S, view to E.*



*Figure 43. Flood damage to a wall in feature WAI-2-T.*





*Figure 44. Dead tree canopy in feature WAI-2-U. Note: Tree system is growing within the structure of the retaining wall.*



*Figure 45. Coconut present in feature WAI-2-V.*





*Figure 46. Barbed wire present in tree in feature WAI-2-W.*



*Figure 47. Vegetation overgrowth along West retaining wall of feature WAI-4W-Y, view to W.*





*Figure 48. Cattle bones found in feature WAI-4W-AC.*



*Figure 49. Cattle pelvis found in feature WAI-4W-AD.*





*Figure 50. Tree system adjoining eastern retaining wall of feature WAI-4W-Y. View to E.*



*Figure 51. Tree growth in center of feature WAI-4W-AA. Note: tree growth in center of feature WAI-4W-Y visible in background. View to S.*